

**DRAFT GLOSSARY AND DEFINITIONS LEGAL TEXT**

**DATED 13/12/17**

Key

- 1) Blue Text – From Grid Code
- 2) Black Text – Changes / Additional words
- 3) Orange/ Brown text – From RfG
- 4) Purple – From HVDC Code
- 5) Green – From DCC (not used in this document)
- 6) Highlighted Green text – Questions for Stakeholders / Consultation
- 7) Highlighted yellow text – Nomenclature / Table / Figure numbers – to be finalised when more detail has been added
- 8) The Baseline version is that issued with the mapping table on 9 November 2017. All updates from this version, including the comments received as part of the Workgroup Consultation, results of the legal drafting session held on 16<sup>th</sup>/17<sup>th</sup> November and the mapping session held on 20 November are in track change marked format.
- 9) Additional comments following issue of G&D's on 1 December 2017 and updated following E-Mail comments and discussion at the workgroup on 6 December 2017.
- 10) Additional comments following issue of G&D's on 6 December following National Grid Legal checks.

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**GLOSSARY & DEFINITIONS  
(GD)**

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

<b>Access Group</b>	<p>A group of <b>Connection Points</b> within which a <b>User</b> declares under the <b>Planning Code</b></p> <p>(a) An interconnection and/or</p> <p>(b) A need to redistribute <b>Demand</b> between those <b>Connection Points</b> either pre-fault or post-fault</p> <p>Where a single <b>Connection Point</b> does not form part of an <b>Access Group</b> in accordance with the above, that single <b>Connection Point</b> shall be considered to be an <b>Access Group</b> in its own right.</p>
<b>Access Period</b>	<p>A period of time in respect of which each <b>Transmission Interface Circuit</b> is to be assessed as whether or not it is capable of being maintained as derived in accordance with PC.A.4.1.4. The period shall commence and end on specified calendar weeks.</p>
<b>Act</b>	<p>The Electricity Act 1989 (as amended by the Utilities Act 2000 and the Energy Act 2004).</p>
<b>Active Energy</b>	<p>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:</p> <p>1000 Wh = 1 kWh</p> <p>1000 kWh = 1 MWh</p> <p>1000 MWh = 1 GWh</p> <p>1000 GWh = 1 TWh</p>

<b>Active Power</b>	The product of voltage and the in-phase component of alternating current measured in units of watts and standard multiples thereof, ie: 1000 Watts = 1 kW 1000 kW = 1 MW 1000 MW = 1 GW 1000 GW = 1 TW
<b>Affiliate</b>	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 <b>Transfer Date</b> , as if such section were in force at such date.
<b>AF Rules</b>	Has the meaning given to “allocation framework” in section 13(2) of the Energy Act 2013.
<b>Agency</b>	As defined in the <b>Transmission Licence</b> .
<b>Alternate Member</b>	Shall mean an alternate member for the <b>Panel Members</b> elected or appointed in accordance with this GR.7.2(a) or (b).
<b>Ancillary Service</b>	A <b>System Ancillary Service</b> and/or a <b>Commercial Ancillary Service</b> , as the case may be.
<b>Ancillary Services Agreement</b>	An agreement between a <b>User</b> and <b>NGET</b> for the payment by <b>NGET</b> to that <b>User</b> in respect of the provision by such <b>User</b> of <b>Ancillary Services</b> .
<b>Annual Average Cold Spell Conditions or ACS Conditions</b>	A particular combination of weather elements which gives rise to a level of peak <b>Demand</b> within a <b>Financial Year</b> which has a 50% chance of being exceeded as a result of weather variation alone.
<b>Apparent Power</b>	The product of voltage and of alternating current measured in units of voltamperes and standard multiples thereof, ie: 1000 VA = 1 kVA 1000 kVA = 1 MVA
<b>Apparatus</b>	Other than in <b>OC8</b> , means all equipment in which electrical conductors are used, supported or of which they may form a part. In <b>OC8</b> it means <b>High Voltage</b> electrical circuits forming part of a <b>System</b> on which <b>Safety Precautions</b> may be applied to allow work and/or testing to be carried out on a <b>System</b> .
<b>Approved Fast Track Proposal</b>	Has the meaning given in GR.26.7, provided that no objection is received pursuant to GR.26.12.
<b>Approved Grid Code Self-Governance Proposal</b>	Has the meaning given in GR.24.10.

<b>Approved Modification</b>	Has the meaning given in GR.22.7
<b>Authorised Certifier</b>	An entity that issues <b>Equipment Certificates</b> and <b>Power Generating Module Documents</b> and whose accreditation is given by the national affiliate of the European cooperation for Accreditation ('EA'), established in accordance with Regulation (EC) No 765/2008 of the European Parliament and of the Council ( 1 );
<b>Authorised Electricity Operator</b>	Any person (other than <b>NGET</b> in its capacity as operator of the <b>National Electricity Transmission System</b> ) who is authorised under the <b>Act</b> to generate, participate in the transmission of, distribute or supply electricity which shall include any <b>Interconnector Owner</b> or <b>Interconnector User</b> ..
<b>Authority-Led Modification</b>	A <b>Grid Code Modification Proposal</b> in respect of a <b>Significant Code Review</b> , raised by the Authority pursuant to GR.17
<b>Authority-Led Modification Report</b>	Has the meaning given in GR.17.4.
<b>Automatic Voltage Regulator or AVR</b>	The continuously acting automatic equipment controlling the terminal voltage of a <b>Synchronous Generating Unit</b> or <b>Synchronous Power Generating Module</b> by comparing the actual terminal voltage with a reference value and controlling by appropriate means the output of an <b>Exciter</b> , depending on the deviations.
<b>Authority for Access</b>	An authority which grants the holder the right to unaccompanied access to sites containing exposed <b>HV</b> conductors.
<b>Authority, The</b>	The <b>Authority</b> established by section 1 (1) of the Utilities Act 2000.
<b>Auxiliaries</b>	Any item of <b>Plant</b> and/or <b>Apparatus</b> not directly a part of the boiler plant or <b>Power Generating Module</b> or <b>Generating Unit</b> or <b>DC Converter</b> or <b>HVDC Equipment</b> or <b>Power Park Module</b> , but required for the boiler plant's or <b>Power Generating Module's</b> or <b>Generating Unit's</b> or <b>DC Converter's</b> or <b>HVDC Equipment's</b> or <b>Power Park Module's</b> functional operation.
<b>Auxiliary Diesel Engine</b>	A diesel engine driving a <b>Power Generating Module</b> or <b>Generating Unit</b> which can supply a <b>Unit Board</b> or <b>Station Board</b> , which can start without an electrical power supply from outside the <b>Power Station</b> within which it is situated.
<b>Auxiliary Gas Turbine</b>	A <b>Gas Turbine Unit</b> , which can supply a <b>Unit Board</b> or <b>Station Board</b> , which can start without an electrical power supply from outside the <b>Power Station</b> within which it is situated.
<b>Average Conditions</b>	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).

<b>Back-Up Protection</b>	A <b>Protection</b> system which will operate when a system fault is not cleared by other <b>Protection</b> .
<b>Balancing and Settlement Code or BSC</b>	The code of that title as from time to time amended.
<b>Balancing Code or BC</b>	That portion of the Grid Code which specifies the <b>Balancing Mechanism</b> process.
<b>Balancing Mechanism</b>	Has the meaning set out in <b>NGET's Transmission Licence</b>
<b>Balancing Mechanism Reporting Agent or BMRA</b>	Has the meaning set out in the <b>BSC</b> .
<b>Balancing Mechanism Reporting Service or BMRS</b>	Has the meaning set out in the <b>BSC</b> .
<b>Balancing Principles Statement</b>	A statement prepared by <b>NGET</b> in accordance with Condition C16 of <b>NGET's Transmission Licence</b> .
<b>Baseline Forecast</b>	Has the meaning given to the term 'baseline forecast' in Section G of the <b>BSC</b> .
<b>Bid-Offer Acceptance</b>	(a) A communication issued by <b>NGET</b> in accordance with <b>BC2.7</b> ; or (b) an <b>Emergency Instruction</b> to the extent provided for in BC2.9.2.3.
<b>Bid-Offer Data</b>	Has the meaning set out in the <b>BSC</b> .
<b>Bilateral Agreement</b>	Has the meaning set out in the <b>CUSC</b>
<b>Black Start</b>	The procedure necessary for a recovery from a <b>Total Shutdown</b> or <b>Partial Shutdown</b> .
<b>Black Start Capability</b>	An ability in respect of a <b>Black Start Station</b> , for at least one of its <b>Gensets</b> to <b>Start-Up</b> from <b>Shutdown</b> and to energise a part of the <b>System</b> and be <b>Synchronised</b> to the <b>System</b> upon instruction from <b>NGET</b> , within two hours, without an external electrical power supply.
<b>Black Start Contract</b>	An agreement between a <b>Generator</b> and <b>NGET</b> under which the <b>Generator</b> provides <b>Black Start Capability</b> and other associated services.
<b>Black Start Stations</b>	<b>Power Stations</b> which are registered, pursuant to the <b>Bilateral Agreement</b> with a <b>User</b> , as having a <b>Black Start Capability</b> .
<b>Black Start Test</b>	A <b>Black Start Test</b> carried out by a <b>Generator</b> with a <b>Black Start Station</b> , on the instructions of <b>NGET</b> , in order to demonstrate that a <b>Black Start Station</b> has a <b>Black Start Capability</b> .

Comment [NG1]: Housekeeping change - unbold

<b>Block Load Capability</b>	The incremental <b>Active Power</b> steps, from no load to <b>Rated MW</b> , which a generator can instantaneously supply without causing it to trip or go outside the <b>Frequency</b> range of 47.5 – 52Hz (or an otherwise agreed <b>Frequency</b> range). The time between each incremental step shall also be provided.
<b>BM Participant</b>	A person who is responsible for and controls one or more <b>BM Units</b> or where a <b>Bilateral Agreement</b> specifies that a <b>User</b> is required to be treated as a <b>BM Participant</b> for the purposes of the Grid Code. For the avoidance of doubt, it does not imply that they must be active in the <b>Balancing Mechanism</b> .
<b>BM Unit</b>	Has the meaning set out in the <b>BSC</b> , except that for the purposes of the Grid Code the reference to “Party” in the <b>BSC</b> shall be a reference to <b>User</b> .
<b>BM Unit Data</b>	The collection of parameters associated with each <b>BM Unit</b> , as described in Appendix 1 of <b>BC1</b> .
<b>Boiler Time Constant</b>	Determined at <b>Registered Capacity</b> or <b>Maximum Capacity</b> (as applicable), the boiler time constant will be construed in accordance with the principles of the IEEE Committee Report "Dynamic Models for Steam and Hydro Turbines in Power System Studies" published in 1973 which apply to such phrase.
<b>British Standards or BS</b>	Those standards and specifications approved by the British Standards Institution.
<b>BSCCo</b>	Has the meaning set out in the <b>BSC</b> .
<b>BSC Panel</b>	Has meaning set out for “Panel” in the <b>BSC</b> .
<b>BS Station Test</b>	A <b>Black Start Test</b> carried out by a <b>Generator</b> with a <b>Black Start Station</b> while the <b>Black Start Station</b> is disconnected from all external alternating current electrical supplies.
<b>BS Unit Test</b>	A <b>Black Start Test</b> carried out on a <b>Generating Unit</b> or a <b>CCGT Unit</b> or a <b>Power Generating Module</b> , as the case may be, at a <b>Black Start Station</b> while the <b>Black Start Station</b> remains connected to an external alternating current electrical supply.
<b>Business Day</b>	Any week day (other than a Saturday) on which banks are open for domestic business in the City of London.
<b>Cancellation of National Electricity Transmission System Warning</b>	The notification given to <b>Users</b> when a <b>National Electricity Transmission System Warning</b> is cancelled.
<b>Capacity Market Documents</b>	The <b>Capacity Market Rules</b> , The Electricity Capacity Regulations 2014 and any other Regulations made under Chapter 3 of Part 2 of the Energy Act 2013 which are in force from time to time.

<b>Capacity Market Rules</b>	The rules made under section 34 of the Energy Act 2013 as modified from time to time in accordance with that section and The Electricity Capacity Regulations 2014.
<b>Cascade Hydro Scheme</b>	Two or more hydro-electric <b>Generating Units</b> , owned or controlled by the same <b>Generator</b> , which are located in the same water catchment area and are at different ordnance datums and which depend upon a common source of water for their operation, known as: <ul style="list-style-type: none"> <li>(a) Moriston</li> <li>(b) Killin</li> <li>(c) Garry</li> <li>(d) Conon</li> <li>(e) Clunie</li> <li>(f) Beaully</li> </ul> which will comprise more than one <b>Power Station</b> .
<b>Cascade Hydro Scheme Matrix</b>	The matrix described in Appendix 1 to <b>BC1</b> under the heading <b>Cascade Hydro Scheme Matrix</b> .
<b>Caution Notice</b>	A notice conveying a warning against interference.
<b>Category 1 Intertripping Scheme</b>	A <b>System to Generator Operational Intertripping Scheme</b> arising from a Variation to Connection Design following a request from the relevant <b>User</b> which is consistent with the criteria specified in the <b>Security and Quality of Supply Standard</b> .
<b>Category 2 Intertripping Scheme</b>	A System to Generator Operational Intertripping Scheme which is:- <ul style="list-style-type: none"> <li>(i) required to alleviate an overload on a circuit which connects the <b>Group</b> containing the <b>User's</b> Connection Site to the <b>National Electricity Transmission System</b>; and</li> <li>(ii) installed in accordance with the requirements of the planning criteria of the <b>Security and Quality of Supply Standard</b> in order that measures can be taken to permit maintenance access for each transmission circuit and for such measures to be economically justified,</li> </ul> and the operation of which results in a reduction in <b>Active Power</b> on the overloaded circuits which connect the <b>User's Connection Site</b> to the rest of the <b>National Electricity Transmission System</b> which is equal to the reduction in <b>Active Power</b> from the <b>Connection Site</b> (once any system losses or third party system effects are discounted).
<b>Category 3 Intertripping Scheme</b>	A <b>System to Generator Operational Intertripping Scheme</b> which, where agreed by <b>NGET</b> and the <b>User</b> , is installed to alleviate an overload on, and as an alternative to, the reinforcement of a third party system, such as the <b>Distribution System</b> of a <b>Public Distribution System Operator</b> .

<b>Category 4 Intertripping Scheme</b>	A <b>System to Generator Operational Intertripping Scheme</b> installed to enable the disconnection of the <b>Connection Site</b> from the <b>National Electricity Transmission System</b> in a controlled and efficient manner in order to facilitate the timely restoration of the <b>National Electricity Transmission System</b> .
<b>CENELEC</b>	European Committee for Electrotechnical Standardisation.
<b>Citizens Advice</b>	Means the National Association of Citizens Advice Bureaux.
<b>Citizens Advice Scotland</b>	Means the Scottish Association of Citizens Advice Bureaux.
<b>CfD Counterparty</b>	A person designated as a “CfD counterparty” under section 7(1) of the Energy Act 2013.
<b>CfD Documents</b>	The <b>AF Rules</b> , The Contracts for Difference (Allocation) Regulations 2014, The Contracts for Difference (Definition of Eligible Generator) Regulations 2014 and The Contracts for Difference (Electricity Supplier Obligations) Regulations 2014 and any other regulations made under Chapter 2 of Part 2 of the Energy Act 2013 which are in force from time to time.
<b>CfD Settlement Services Provider</b>	means any person: <ul style="list-style-type: none"> <li>(i) appointed for the time being and from time to time by a <b>CFD Counterparty</b>; or</li> <li>(ii) who is designated by virtue of Section C1.2.1B of the Balancing and Settlement Code,</li> </ul> <p>in either case to carry out any of the CFD settlement activities (or any successor entity performing CFD settlement activities).</p>
<b>CCGT Module Matrix</b>	The matrix described in Appendix 1 to BC1 under the heading <b>CCGT Module Matrix</b> .
<b>CCGT Module Planning Matrix</b>	A matrix in the form set out in Appendix 3 of OC2 showing the combination of <b>CCGT Units</b> within a <b>CCGT Module</b> which would be running in relation to any given MW output.

<b>Closed Distribution System or CDSO</b>	a distribution system classified pursuant to Article 28 of Directive 2009/72/EC as a closed distribution system by national regulatory authorities or by other competent authorities, where so provided by the Member State, which distributes electricity within a geographically confined industrial, commercial or shared services site and does not supply household customers, without prejudice to incidental use by a small number of households located within the area served by the system and with employment or similar associations with the owner of the system
<b>CM Administrative Parties</b>	The <b>Secretary of State</b> , the <b>CM Settlement Body</b> , and any <b>CM Settlement Services Provider</b> .
<b>CM Settlement Body</b>	the Electricity Settlements Company Ltd or such other person as may from time to time be appointed as Settlement Body under regulation 80 of the Electricity Capacity Regulations 2014.
<b>CM Settlement Services Provider</b>	any person with whom the <b>CM Settlement Body</b> has entered into a contract to provide services to it in relation to the performance of its functions under the <b>Capacity Market Documents</b> .
<b>Code Administration Code of Practice</b>	Means the code of practice approved by the <b>Authority</b> and: <ul style="list-style-type: none"> <li>(a) developed and maintained by the code administrators in existence from time to time; and</li> <li>(b) amended subject to the <b>Authority's</b> approval from time to time; and</li> <li>(c) re-published from time to time;</li> </ul>
<b>Code Administrator</b>	Means <b>NGET</b> carrying out the role of <b>Code Administrator</b> in accordance with the General Conditions.
<b>Combined Cycle Gas Turbine Module or CCGT Module</b>	A collection of <b>Generating Units</b> (registered as a <b>CCGT Module</b> (which could be within a <b>Power Generating Module</b> ) under the PC) comprising one or more <b>Gas Turbine Units</b> (or other gas based engine units) and one or more <b>Steam Units</b> where, in normal operation, the waste heat from the <b>Gas Turbines</b> is passed to the water/steam system of the associated <b>Steam Unit</b> or <b>Steam Units</b> and where the component units within the <b>CCGT Module</b> 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 <b>CCGT Module</b> .
<b>Combined Cycle Gas Turbine Unit or CCGT Unit</b>	A <b>Generating Unit</b> within a <b>CCGT Module</b> .

**Comment [NG2]:** This requires further consideration. It is more of a DCC issue but there is no definition of Distribution System in the DCC Code.

<b>Commercial Ancillary Services</b>	<b>Ancillary Services</b> , other than <b>System Ancillary Services</b> , utilised by NGET in operating the <b>Total System</b> if a <b>User</b> (or other person) has agreed to provide them under an <b>Ancillary Services Agreement</b> or under a <b>Bilateral Agreement</b> with payment being dealt with under an <b>Ancillary Services Agreement</b> or in the case of <b>Externally Interconnected System Operators</b> or <b>Interconnector Users</b> , under any other agreement (and in the case of <b>Externally Interconnected System Operators</b> and <b>Interconnector Users</b> includes ancillary services equivalent to or similar to <b>System Ancillary Services</b> ).
<b>Commercial Boundary</b>	Has the meaning set out in the <b>CUSC</b>
<b>Committed Project Planning Data</b>	Data relating to a <b>User Development</b> once the offer for a <b>CUSC Contract</b> is accepted.
<b>Common Collection Busbar</b>	A busbar within a <b>Power Park Module</b> to which the higher voltage side of two or more <b>Power Park Unit</b> generator transformers are connected.
<b>Completion Date</b>	Has the meaning set out in the <b>Bilateral Agreement</b> with each <b>User</b> to that term or in the absence of that term to such other term reflecting the date when a <b>User</b> is expected to connect to or start using the <b>National Electricity Transmission System</b> . In the case of an <b>Embedded Medium Power Station</b> or <b>Embedded DC Converter Station</b> or <b>Embedded HVDC System</b> having a similar meaning in relation to the <b>Network Operator's System</b> as set out in the <b>Embedded Development Agreement</b> .
<b>Complex</b>	A <b>Connection Site</b> together with the associated <b>Power Station</b> and/or <b>Network Operator</b> substation and/or associated <b>Plant</b> and/or <b>Apparatus</b> , as appropriate.
<b>Compliance Processes or CP</b>	That portion of the Grid Code which is identified as the <b>Compliance Processes</b> .
<b>Compliance Statement</b>	A statement completed by the relevant <b>User</b> confirming compliance with each of the relevant Grid Code provisions, and the supporting evidence in respect of such compliance, of its: <b>Generating Unit(s)</b> ; or, <b>Power Generating Modules</b> (including <b>DC Connected Power Park Modules</b> ); or, <b>CCGT Module(s)</b> ; or, <b>Power Park Module(s)</b> ; or, <b>DC Converter(s)</b> ; or <b>HVDC Systems</b> in the form provided by NGET to the relevant <b>User</b> or another format as agreed between the <b>User</b> and NGET.

<b>Configuration 1 AC Connected Offshore Power Park Module</b>	One or more <b>Offshore Power Park Modules</b> that are connected to an AC <b>Offshore Transmission System</b> and that AC <b>Offshore Transmission System</b> is connected to only one <b>Onshore</b> substation and which has one or more <b>Interface Points</b> .
<b>Configuration 2 AC Connected Offshore Power Park Module</b>	One or more <b>Offshore Power Park Modules</b> that are connected to a meshed AC <b>Offshore Transmission System</b> and that AC <b>Offshore Transmission System</b> is connected to two or more <b>Onshore</b> substations at its <b>Transmission Interface Points</b> .
<b>Configuration 1 DC Connected Power Park Module</b>	One or more <b>DC Connected Power Park Modules</b> that are connected to an <b>HVDC System</b> or <b>Transmission DC Converter</b> and that <b>HVDC System</b> or <b>Transmission DC Converter</b> is connected to only one <b>Onshore</b> substation and which has one or more <b>Interface Points</b> .
<b>Configuration 2 DC Connected Power Park Module</b>	One or more <b>DC Connected Power Park Modules</b> that are connected to an <b>HVDC System</b> or <b>Transmission DC Converter</b> and that <b>HVDC System</b> or <b>Transmission DC Converter</b> is connected to only more than one <b>Onshore</b> substation at its <b>Transmission Interface Points</b> .
<b>Connection Conditions or CC</b>	That portion of the Grid Code which is identified as the <b>Connection Conditions</b> being applicable to <b>Existing Users</b> .
<b>Connection Entry Capacity</b>	Has the meaning set out in the <b>CUSC</b>
<b>Connected Planning Data</b>	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 <b>Forecast Data</b> items such as <b>Demand</b> .
<b>Connection Point</b>	A <b>Grid Supply Point</b> or <b>Grid Entry Point</b> , as the case may be.
<b>Connection Site</b>	A <b>Transmission Site</b> or <b>User Site</b> , as the case may be.
<b>Construction Agreement</b>	Has the meaning set out in the <b>CUSC</b>
<b>Consumer Representative</b>	Means the person appointed by the <b>Citizens Advice</b> or the <b>Citizens Advice Scotland</b> (or any successor body) representing all categories of customers, appointed in accordance with GR.4.2(b)
<b>Contingency Reserve</b>	The margin of generation over forecast <b>Demand</b> which is required in the period from 24 hours ahead down to real time to cover against uncertainties in <b>Large Power Station</b> availability and against both weather forecast and <b>Demand</b> forecast errors.
<b>Control Calls</b>	A telephone call whose destination and/or origin is a key on the control desk telephone keyboard at a <b>Transmission Control Centre</b> and which, for the purpose of <b>Control Telephony</b> , has the right to exercise priority over (ie. disconnect) a call of a lower status.

<b>Control Centre</b>	A location used for the purpose of control and operation of the <b>National Electricity Transmission System</b> or <b>DC Converter Station</b> owner's <b>System</b> or <b>HVDC System Owner's System</b> or a <b>User System</b> other than a <b>Generator's System</b> or an <b>External System</b> .
<b>Control Engineer</b>	A person nominated by the relevant party for the control of its <b>Plant</b> and <b>Apparatus</b> .
<b>Control Person</b>	The term used as an alternative to "Safety Co-ordinator" on the <b>Site Responsibility Schedule</b> only.
<b>Control Phase</b>	The <b>Control Phase</b> follows on from the <b>Programming Phase</b> and covers the period down to real time.
<b>Control Point</b>	<p>The point from which:-</p> <p>(a) A <b>Non-Embedded Customer's Plant</b> and <b>Apparatus</b> is controlled; or</p> <p>(b) A <b>BM Unit</b> at a <b>Large Power Station</b> or at a <b>Medium Power Station</b> or representing a <b>Cascade Hydro Scheme</b> or with a <b>Demand Capacity</b> with a magnitude of:</p> <p>(i) 50MW or more in <b>NGET's Transmission Area</b>; or</p> <p>(ii) 30MW or more in <b>SPT's Transmission Area</b>; or</p> <p>(iii) 10MW or more in <b>SHETL's Transmission Area</b>,</p> <p>(iv) 10MW or more which is connected to an <b>Offshore Transmission System</b></p> <p>is physically controlled by a <b>BM Participant</b>; or</p> <p>(c) In the case of any other <b>BM Unit</b> or <b>Generating Unit</b> (which could be part of a <del>or</del> <b>Power Generating Module</b>), data submission is co-ordinated for a <b>BM Participant</b> and instructions are received from <b>NGET</b>,</p> <p>as the case may be. For a <b>Generator</b> this will normally be at a <b>Power Station</b> but may be at an alternative location agreed with <b>NGET</b>. In the case of a <b>DC Converter Station</b> or <b>HVDC System</b>, the <b>Control Point</b> will be at a location agreed with <b>NGET</b>. In the case of a <b>BM Unit</b> of an <b>Interconnector User</b>, the <b>Control Point</b> will be the <b>Control Centre</b> of the relevant <b>Externally Interconnected System Operator</b>.</p>
<b>Control Telephony</b>	The principal method by which a <b>User's Responsible Engineer/Operator</b> and <b>NGET Control Engineer(s)</b> speak to one another for the purposes of control of the <b>Total System</b> in both normal and emergency operating conditions.
<b>Core Industry Document</b>	as defined in the <b>Transmission Licence</b>

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<b>Core Industry Document Owner</b>	In relation to a <b>Core Industry Document</b> , the body(ies) or entity(ies) responsible for the management and operation of procedures for making changes to such document
<b>CUSC</b>	Has the meaning set out in <b>NGET's Transmission Licence</b>
<b>CUSC Contract</b>	One or more of the following agreements as envisaged in Standard Condition C1 of <b>NGET's Transmission Licence</b> : (a) the <b>CUSC Framework Agreement</b> ; (b) a <b>Bilateral Agreement</b> ; (c) a <b>Construction Agreement</b> or a variation to an existing <b>Bilateral Agreement</b> and/or <b>Construction Agreement</b> ;
<b>CUSC Framework Agreement</b>	Has the meaning set out in <b>NGET's Transmission Licence</b>
<b>CUSC Party</b>	As defined in the Transmission Licence and "CUSC Parties" shall be construed accordingly.
<b>Customer</b>	A person to whom electrical power is provided (whether or not he is the same person as the person who provides the electrical power).
<b>Customer Demand Management</b>	Reducing the supply of electricity to a <b>Customer</b> or disconnecting a <b>Customer</b> in a manner agreed for commercial purposes between a <b>Supplier</b> and its <b>Customer</b> .
<b>Customer Demand Management Notification Level</b>	The level above which a <b>Supplier</b> has to notify <b>NGET</b> of its proposed or achieved use of <b>Customer Demand Management</b> which is 12 MW in England and Wales and 5 MW in Scotland.
<b>Customer Generating Plant</b>	A <b>Power Station</b> or <b>Generating Unit</b> or <b>Power Generating Module</b> of a <b>Customer</b> 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 <b>Total System</b> .
<b>Data Registration Code or DRC</b>	That portion of the Grid Code which is identified as the <b>Data Registration Code</b> .
<b>Data Validation, Consistency and Defaulting Rules</b>	The rules relating to validity and consistency of data, and default data to be applied, in relation to data submitted under the <b>Balancing Codes</b> , to be applied by <b>NGET</b> under the <b>Grid Code</b> as set out in the document "Data Validation, Consistency and Defaulting Rules" - Issue 8, dated 25 <sup>th</sup> January 2012. The document is available on the National Grid website or upon request from <b>NGET</b> .
<b>DC Connected Power Park Module</b>	A <b>Power Park Module</b> that is connected to one or more <b>HVDC Interface Points</b> .

<b>DC Converter</b>	Any <b>Onshore DC Converter</b> or <b>Offshore DC Converter</b> as applicable to <b>Existing User's</b> .
<b>DC Converter Station</b>	An installation comprising one or more <b>Onshore DC Converters</b> connecting a direct current interconnector:  to the <b>NGET Transmission System</b> ; or,  (if the installation has a rating of 50MW or more) to a <b>User System</b> ,  and it shall form part of the <b>External Interconnection</b> to which it relates.
<b>DC Network</b>	All items of <b>Plant</b> and <b>Apparatus</b> connected together on the direct current side of a <b>DC Converter</b> or <b>HVDC System</b> .
<b>DCUSA</b>	The Distribution Connection and Use of System Agreement approved by the <b>Authority</b> and required to be maintained in force by each <b>Electricity Distribution Licence</b> holder.
<b>De-Load</b>	The condition in which a <b>Genset</b> has reduced or is not delivering electrical power to the <b>System</b> to which it is <b>Synchronised</b> .
$\Delta f$	Deviation from <b>Target Frequency</b>
<b>Demand</b>	The demand of MW and Mvar of electricity (i.e. both <b>Active</b> and <b>Reactive Power</b> ), unless otherwise stated.
<b>Demand Aggregation</b>	A set of <b>Demand Facilities</b> or <b>Closed Distribution Systems</b> which can operate as a single facility or <b>Closed Distribution System</b> for the purposes of offering one or more <b>Demand Response Services</b>
<b>Demand Capacity</b>	Has the meaning as set out in the <b>BSC</b> .
<b>Demand Control</b>	Any or all of the following methods of achieving a <b>Demand</b> reduction:  (a) <b>Customer</b> voltage reduction initiated by <b>Network Operators</b> (other than following an instruction from <b>NGET</b> );  (b) <b>Customer Demand</b> reduction by <b>Disconnection</b> initiated by <b>Network Operators</b> (other than following an instruction from <b>NGET</b> );  (c) <b>Demand</b> reduction instructed by <b>NGET</b> ;  (d) automatic low <b>Frequency Demand Disconnection</b> ;  (e) emergency manual <b>Demand Disconnection</b> .
<b>Demand Control Notification Level</b>	The level above which a <b>Network Operator</b> has to notify <b>NGET</b> of its proposed or achieved use of <b>Demand Control</b> which is 12 MW in England and Wales and 5 MW in Scotland.

**Comment [NG3]:** This may need to be updated when GC0104 is introduced

<b>Demand Facility</b>	A facility which consumes electrical energy and is connected at one or more <b>Connection Grid Supply Points</b> to the <b>National Electricity Transmission System</b> or connection points to a <b>Network Operators distribution System</b> . A <del>distribution</del> <b>Network Operators System</b> and/or auxiliary supplies of a <b>Power Generating Module</b> do not constitute a <b>Demand Facility</b> ;
<b>Demand Response Active Power Control</b>	<b>Demand</b> within a <b>Demand Facility</b> or <b>Closed Distribution System</b> that is available for modulation by <b>NGET</b> or <b>Network Operator</b> <del>the relevant system operator</del> or <b>Relevant Transmission Licensee TSO</b> , which results in an <b>Active Power</b> modification;
<b>Demand Response Reactive Power Control</b>	<b>Reactive Power</b> or <b>Reactive Power</b> compensation devices in a <b>Demand Facility</b> or <b>Closed Distribution System</b> that are available for modulation by <b>NGET</b> or <b>Network Operator</b> <del>the relevant system operator</del> or relevant <b>Transmission Licensee TSO</b>
<b>Demand Response Transmission Constrain Management</b>	<b>Demand</b> within a <b>Demand Facility</b> or <b>Closed Distribution System</b> that is available for modulation by <b>NGET</b> or <b>Network Operator</b> <del>the relevant system operator</del> or <b>Relevant Transmission Licensee TSO</b> to manage transmission constraints within the <b>System</b>
<b>Demand Response Services</b>	A <b>Demand Response Service</b> includes one of more of the following services <ul style="list-style-type: none"> <li>(a) <b>Demand Response Active Power Control</b></li> <li>(b) <b>Demand Response Reactive Power Control</b></li> <li>(c) <b>Demand Response Transmission Constraint Management</b></li> <li>(d) <b>Demand Response System Frequency Control</b></li> <li>(e) <b>Demand Response Very Fast Active Power Control</b></li> </ul>
<b>Demand Response System Frequency Control</b>	<b>Demand</b> within a <b>Demand Facility</b> or <b>Closed Distribution System</b> that is available for reduction or increase in response to <b>Frequency</b> fluctuations, made by an autonomous response from the <b>Demand Facility</b> or <b>Closed Distribution System</b> to diminish these fluctuations
<b>Demand Response Very Fast Active Power Control</b>	<b>Demand</b> within a <b>Demand Facility</b> or <b>Closed Distribution System</b> that can be modulated very fast in response to a <b>Frequency</b> deviation, which results in a very fast <b>Active Power</b> modification
<b>Demand Unit</b>	An indivisible set of installations containing equipment which can be actively controlled by a <b>Demand Facility Owner</b> or by a <b>CDSO</b> or by a <b>Non Embedded Customer</b> , either individually or commonly as part of <b>Demand Aggregation</b> through a third party.
<b>Designed Minimum Operating Level</b>	The output (in whole MW) below which a <b>Genset</b> or a <b>DC Converter</b> at a <b>DC Converter Station</b> (in any of its operating configurations) has no <b>High Frequency Response</b> capability.
<b>De-Synchronise</b>	<ul style="list-style-type: none"> <li>(a) The act of taking a <b>Power Generating Module</b> (including a <b>DC Connected Power Park Module</b>), <b>Generating Unit</b>, <b>Power Park Module</b>, <b>HVDC System</b> or <b>DC Converter</b> off a <b>System</b> to which it has been <b>Synchronised</b>, by opening any connecting circuit breaker; or</li> <li>(b) The act of ceasing to consume electricity at an importing <b>BM Unit</b>; and the term "<b>De-Synchronising</b>" shall be construed accordingly.</li> </ul>

<b>De-synchronised Island(s)</b>	Has the meaning set out in OC9.5.1(a)
<b>Detailed Planning Data</b>	Detailed additional data which <b>NGET</b> requires under the <b>PC</b> in support of <b>Standard Planning Data</b> , comprising <b>DPD I</b> and <b>DPD II</b>
<b>Detailed Planning Data Category I or DPD I</b>	The <b>Detailed Planning Data</b> categorised as such in the <b>DRC</b> and <b>EDRC</b> , and submitted in accordance with PC.4.4.2 or PC.4.4.4 as applicable.
<b>Detailed Planning Data Category II or DPD II</b>	The <b>Detailed Planning Data</b> categorised as such in the <b>DRC</b> and <b>EDRC</b> , and submitted in accordance with PC.4.4.2 or PC.4.4.4 as applicable.
<b>Discrimination</b>	The quality where a relay or protective system is enabled to pick out and cause to be disconnected only the faulty <b>Apparatus</b> .
<b>Disconnection</b>	The physical separation of <b>Users</b> (or <b>Customers</b> ) from the <b>National Electricity Transmission System</b> or a <b>User System</b> as the case may be.
<b>Disputes Resolution Procedure</b>	The procedure described in the <b>CUSC</b> relating to disputes resolution.
<b>Distribution Code</b>	The distribution code required to be drawn up by each <b>Electricity Distribution Licence</b> holder and approved by the <b>Authority</b> , as from time to time revised with the approval of the <b>Authority</b> .
<b>Droop</b>	The ratio of the per unit steady state change in speed, or in <b>Frequency</b> to the per unit steady state change in power output. Whilst not mandatory, it is often common practice to express <b>Droop</b> in percentage terms.
<b>Dynamic Parameters</b>	Those parameters listed in Appendix 1 to <b>BC1</b> under the heading <b>BM Unit Data – Dynamic Parameters</b> .
<b>E&amp;W Offshore Transmission System</b>	An <b>Offshore Transmission System</b> with an <b>Interface Point</b> in England and Wales.
<b>E&amp;W Offshore Transmission Licensee</b>	A person who owns or operates an <b>E&amp;W Offshore Transmission System</b> pursuant to a <b>Transmission Licence</b> .
<b>E&amp;W Transmission System</b>	Collectively <b>NGET's Transmission System</b> and any <b>E&amp;W Offshore Transmission Systems</b> .
<b>E&amp;W User</b>	A <b>User</b> in <b>England</b> and <b>Wales</b> or any <b>Offshore User</b> who owns or operates <b>Plant</b> and/or <b>Apparatus</b> connected (or which will at the <b>OTSUA Transfer Time</b> be connected) to an <b>E&amp;W Offshore Transmission System</b> .

<b>Earth Fault Factor</b>	At a selected location of a three-phase <b>System</b> (generally the point of installation of equipment) and for a given <b>System</b> configuration, the ratio of the highest root mean square phase-to-earth power <b>Frequency</b> 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 <b>Frequency</b> voltage which would be obtained at the selected location without the fault.
<b>Earthing</b>	A way of providing a connection between conductors and earth by an <b>Earthing Device</b> which is either: <ul style="list-style-type: none"> <li>(a) Immobilised and <b>Locked</b> in the earthing position. Where the <b>Earthing Device</b> is <b>Locked</b> with a <b>Safety Key</b>, the <b>Safety Key</b> must be secured in a <b>Key Safe</b> and the <b>Key Safe Key</b> must be, where reasonably practicable, given to the authorised site representative of the <b>Requesting Safety Co-ordinator</b> and is to be retained in safe custody. Where not reasonably practicable the <b>Key Safe Key</b> must be retained by the authorised site representative of the <b>Implementing Safety Co-ordinator</b> in safe custody; or</li> <li>(b) maintained and/or secured in position by such other method which must be in accordance with the <b>Local Safety Instructions</b> of <b>NGET</b> or the <b>Safety Rules</b> of the <b>Relevant Transmission Licensee</b> or that <b>User</b>, as the case may be.</li> </ul>
<b>Earthing Device</b>	A means of providing a connection between a conductor and earth being of adequate strength and capability.
<b>Elected Panel Members</b>	Shall mean the following <b>Panel Members</b> elected in accordance with GR4.2(a): <ul style="list-style-type: none"> <li>(a) the representative of the <b>Suppliers</b>;</li> <li>(b) the representative of the <b>Onshore Transmission Licensees</b>;</li> <li>(c) the representative of the <b>Offshore Transmission Licensees</b>; and</li> <li>(d) the representatives of the <b>Generators</b></li> </ul>
<b>Electrical Standard</b>	A standard listed in the Annex to the <b>General Conditions</b> .
<b>Electricity Council</b>	That body set up under the Electricity Act, 1957.
<b>Electricity Distribution Licence</b>	The licence granted pursuant to Section 6(1) (c) of the <b>Act</b> .
<b>Electricity Regulation</b>	As defined in the <b>Transmission Licence</b> .
<b>Electricity Supply Industry Arbitration Association</b>	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.
<b>Electricity Supply Licence</b>	The licence granted pursuant to Section 6(1) (d) of the <b>Act</b> .

<b>Electromagnetic Compatibility Level</b>	Has the meaning set out in <b>Engineering Recommendation G5/4</b> .
<b>Embedded</b>	Having a direct connection to a <b>User System</b> or the <b>System</b> of any other <b>User</b> to which <b>Customers</b> and/or <b>Power Stations</b> are connected, such connection being either a direct connection or a connection via a busbar of another <b>User</b> or of a <b>Transmission Licensee</b> (but with no other connection to the <b>National Electricity Transmission System</b> ).
<b>Embedded Development</b>	Has the meaning set out in PC.4.4.3(a)
<b>Embedded Development Agreement</b>	An agreement entered into between a <b>Network Operator</b> and an <b>Embedded Person</b> , identifying the relevant site of connection to the <b>Network Operator's System</b> and setting out other site specific details in relation to that use of the <b>Network Operator's System</b> .
<b>Embedded Person</b>	The party responsible for a <b>Medium Power Station</b> not subject to a <b>Bilateral Agreement</b> or <b>DC Converter Station</b> not subject to a <b>Bilateral Agreement</b> or <b>HVDC System</b> not subject to a <b>Bilateral Agreement</b> connected to or proposed to be connected to a <b>Network Operator's System</b> .
<b>Emergency Deenergisation Instruction</b>	an <b>Emergency Instruction</b> issued by <b>NGET</b> to <b>De-Synchronise</b> a <b>Power Generating Module</b> (including a <b>DC Connected Power Park Module</b> ), <b>Generating Unit</b> , <b>Power Park Module</b> , <b>HVDC System</b> or <b>DC Converter</b> in circumstances specified in the <b>CUSC</b> .
<b>Emergency Instruction</b>	An instruction issued by <b>NGET</b> in emergency circumstances, pursuant to BC2.9, to the <b>Control Point</b> of a <b>User</b> . In the case of such instructions applicable to a <b>BM Unit</b> , it may require an action or response which is outside the <b>Dynamic Parameters</b> , <b>QPN</b> or <b>Other Relevant Data</b> , and may include an instruction to trip a <b>Genset</b> .
<b>EMR Administrative Parties</b>	Has the meaning given to "administrative parties" in The Electricity Capacity Regulations 2014 and each <b>CfD Counterparty</b> and <b>CfD Settlement Services Provider</b> .
<b>EMR Documents</b>	The Energy Act 2013, The Electricity Capacity Regulations 2014, the <b>Capacity Market Rules</b> , The Contracts for Difference (Allocation) Regulations 2014, The Contracts for Difference (Definition of Eligible Generator) Regulations 2014, The Contracts for Difference (Electricity Supplier Obligations) Regulations 2014, The Electricity Market Reform (General) Regulations 2014, the <b>AF Rules</b> and any other regulations or instruments made under Chapter 2 (contracts for difference), Chapter 3 (capacity market) or Chapter 4 (investment contracts) of Part 2 of the Energy Act 2013 which are in force from time to time.
<b>EMR Functions</b>	Has the meaning given to "EMR functions" in Chapter 5 of Part 2 of the Energy Act 2013.

<b>Engineering Recommendations</b>	The documents referred to as such and issued by the Energy Networks Association or the former Electricity Council.
<b>Energisation Operational Notification or EON</b>	A notification (in respect of <b>Plant</b> and <b>Apparatus</b> (including <b>OTSUA</b> ) which is directly connected to the <b>National Electricity Transmission System</b> ) from <b>NGET</b> to a <b>User</b> confirming that the <b>User</b> can in accordance with the <b>Bilateral Agreement</b> and/or <b>Construction Agreement</b> , energise such <b>User's Plant</b> and <b>Apparatus</b> (including <b>OTSUA</b> ) specified in such notification.
<b>Equipment Certificate</b>	A document issued by an authorised certifier for equipment used by a <b>Power Generating Module, Demand Unit, Network Operators System, Non Embedded Customers System, Demand Facility</b> or <b>HVDC System</b> . The <b>Equipment Certificate</b> defines the scope of its validity at a national or other level at which a specific value is selected from the range allowed at a European level. For the purpose of replacing specific parts of the compliance process, the <b>Equipment Certificate</b> may include models that have been verified against actual test results
<b>Estimated Registered Data</b>	Those items of <b>Standard Planning Data</b> and <b>Detailed Planning Data</b> which either upon connection will become <b>Registered Data</b> , or which for the purposes of the <b>Plant</b> and/or <b>Apparatus</b> concerned as at the date of submission are <b>Registered Data</b> , but in each case which for the seven succeeding <b>Financial Years</b> will be an estimate of what is expected.

<b>EU Code User</b>	<p>A User who is any of the following:-</p> <p>(a) A Generator in respect of a Power Generating Module (excluding a DC Connected Power Park Module) or OTSDUA (in respect of an AC Offshore Transmission System) whose Main Plant and Apparatus is connected to the System after 17 May 2019 and who concluded Purchase Contracts for its Main Plant and Apparatus after 17 May 2018</p> <p>(b) A Generator in respect of any Type C or Type D Power Generating Module which is the subject of a Substantial Modification which is effective on or after 17 May 2019.</p> <p>(c) A Generator in respect of any DC Connected Power Park Module whose Main Plant and Apparatus is connected to the System after 28 September 2019 and who had concluded Purchase Contracts for its Main Plant and Apparatus after 28 September 2018.</p> <p>(d) A Generator in respect of any DC Connected Power Park Module which is the subject of a Substantial Modification which is effective on or after 28 September 2019.</p> <p>(e) An HVDC System Owner or OTSDUA (in respect of a DC Offshore Transmission System including a Transmision DC Converter) whose Main Plant and Apparatus is connected to the System after 28 September 2019 and who had concluded Purchase Contracts for its Main Plant and Apparatus after 28 September 2018.</p> <p>(f) An HVDC System Owner or OTSDUA (in respect of a DC Offshore Transmission System including a Transmision DC Converter) whose HVDC System or DC Offshore Transmission System including a Transmission DC Converter) is the subject of a Substantial Modification on or after 28 September 2019.</p> <p>(g) A User which the Authority has determined should be considered as an EU Code User.</p> <p>(h) A Network Operator or Non-Embedded Customer who's Main Plant and Apparatus was connected to the Transmission System after 7 September 2019 or who had placed Purchase Contracts for its Main Plant and Apparatus after 7 September 2018 or had substantially Substantially Modified their Plant and Apparatus after 7 September 2019.</p>
<b>EU Generator</b>	A Generator or OTSDUA who is also an EU Code User.
<b>EU Transparency Availability Data</b>	Such data as Customers and Generators are required to provide under Articles 7.1(a) and 7.1(b) and Articles 15.1(a), 15.1(b), 15.1(c), 15.1(d) of European Commission Regulation (EU) No. 543/2013 respectively (known as the Transparency Regulation), and which also forms part of DRC Schedule 6 (Users' Outage Data).

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**Comment [NG4]:** Demand Customers and Network Operators should be removed from this definition as they would be covered under GC0104. For the purposes of this drafting Demand Customers should satisfy the requirements of the CC's not ECC's.

**Comment [NG5]:** Clarification required for New Transmission Connected Distribution Substations but which are part of an existing Distribution System.

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<b>European Compliance Processes or ECP</b>	That portion of the Grid Code which is identified as the <b>European Compliance Processes</b> .
<b>European Connection Conditions or ECC</b>	That portion of the Grid Code which is identified as the <b>European Connection Conditions</b> being applicable to <b>EU Code New Users</b> .
<del><b>European Data Registration Code or EDRG</b></del>	<del>That portion of the Grid Code which is identified as the <b>European Data Registration Code</b> applying to <b>New User's</b> only.</del>
<b>European Regulation (EU) 2016/631</b>	<b>Commission Regulation (EU) 2016/631</b> of 14 April 2016 establishing a Network Code on Requirements of Generators
<b>European Regulation (EU) 2016/1388</b>	<b>Commission Regulation (EU) 2016/1388</b> of 17 August 2016 establishing a Network Code on Demand Connection
<del><b>European Commission Regulation (EU) 2016/1447</b></del>	<del><b>Commission Regulation (EU) 2016/1447</b> of 26 August 2016 establishing a network code on requirements for Grid Connection of High Voltage Direct Current Systems and Direct Current-connected Power Park Modules</del>
<b>European Specification</b>	A common technical specification, a <b>British Standard</b> 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 <b>Regulations</b> .
<b>Event</b>	An unscheduled or unplanned (although it may be anticipated) occurrence on, or relating to, a <b>System</b> (including <b>Embedded Power Stations</b> ) including, without limiting that general description, faults, incidents and breakdowns and adverse weather conditions being experienced.
<del><b>Existing Generator</b></del>	<del>A <b>Generator</b> which is owned and/or operated by an <b>Existing User</b>.</del>

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<b>Existing User</b>	<p>A <b>User</b> in respect of:-</p> <p>(a) <del>A <b>Generator</b> who's <b>Main Plant and Apparatus</b> was connected to the <b>System</b> before 17 May 2018 or who had placed <b>Purchase Contracts</b> for its <b>Main Plant and Apparatus</b> before 17 May 2018 or has not <b>Substantially Modified</b> their <b>Plant and Apparatus</b> after 17 May 2018.</del></p> <p>(b) <del>A <b>DC Converter Station</b> owner who's <b>Main Plant and Apparatus</b> was connected to the <b>System</b> before 28 September 2018 or who had placed <b>Purchase Contracts</b> for its <b>Main Plant and Apparatus</b> before 28 September 2018 or has not <b>Substantially Modified</b> their <b>Plant and Apparatus</b> after 28<sup>th</sup> September 2018.</del></p> <p>(c) <del>(a) A <b>Network Operator</b> or <b>Non Embedded Customer</b> or who's <b>Main Plant and Apparatus</b> was connected to the <b>System</b> before 7 September 2018 or who had placed <b>Purchase Contracts</b> for its <b>Main Plant and Apparatus</b> before 7 September 2018 or has not <b>Substantially Modified</b> their <b>Plant and Apparatus</b> after 7 September 2018.</del></p>
<b>Exciter</b>	The source of the electrical power providing the field current of a synchronous machine.
<b>Excitation System</b>	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.
<b>Excitation System No-Load Negative Ceiling Voltage</b>	The minimum value of direct voltage that the <b>Excitation System</b> is able to provide from its terminals when it is not loaded, which may be zero or a negative value.
<b>Excitation System Nominal Response</b>	Shall have the meaning ascribed to that term in <b>IEC 34-16-1:1991</b> [equivalent to <b>British Standard BS4999</b> Section 116.1 : 1992]. The time interval applicable is the first half-second of excitation system voltage response.
<b>Excitation System On-Load Positive Ceiling Voltage</b>	Shall have the meaning ascribed to the term 'Excitation system on load ceiling voltage' in <b>IEC 34-16-1:1991</b> [equivalent to <b>British Standard BS4999</b> Section 116.1 : 1992].
<b>Excitation System No-Load Positive Ceiling Voltage</b>	Shall have the meaning ascribed to the term 'Excitation system no load ceiling voltage' in <b>IEC 34-16-1:1991</b> [equivalent to <b>British Standard BS4999</b> Section 116.1 : 1992].
<b>Exemptable</b>	Has the meaning set out in the <b>CUSC</b> .

<b>Existing AGR Plant</b>	<p>The following nuclear advanced gas cooled reactor plant (which was commissioned and connected to the <b>Total System</b> at the <b>Transfer Date</b>):-</p> <ul style="list-style-type: none"> <li>(a) Dungeness B</li> <li>(b) Hinkley Point B</li> <li>(c) Heysham 1</li> <li>(d) Heysham 2</li> <li>(e) Hartlepool</li> <li>(f) Hunterston B</li> <li>(g) Torness</li> </ul>
<b>Existing AGR Plant Flexibility Limit</b>	<p>In respect of each <b>Genset</b> within each <b>Existing AGR Plant</b> 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 <b>NGET</b> in relation to operation in <b>Frequency Sensitive Mode</b> 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 <b>NGET</b>) for the purpose of assisting in the period of low <b>System NRAPM</b> and/or low <b>Localised NRAPM</b> provided that in relation to each <b>Generating Unit</b> 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 <b>NGET</b> 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).</p>
<b>Existing Gas Cooled Reactor Plant</b>	<p>Both <b>Existing Magnox Reactor Plant</b> and <b>Existing AGR Plant</b>.</p>
<b>Existing Magnox Reactor Plant</b>	<p>The following nuclear gas cooled reactor plant (which was commissioned and connected to the <b>Total System</b> at the <b>Transfer Date</b>):-</p> <ul style="list-style-type: none"> <li>(a) Calder Hall</li> <li>(b) Chapelcross</li> <li>(c) Dungeness A</li> <li>(d) Hinkley Point A</li> <li>(e) Oldbury-on-Severn</li> <li>(f) Bradwell</li> <li>(g) Sizewell A</li> <li>(h) Wylfa</li> </ul>
<b>Export and Import Limits</b>	<p>Those parameters listed in Appendix 1 to <b>BC1</b> under the heading <b>BM Unit Data – Export and Import Limits</b>.</p>

<b>External Interconnection</b>	<b>Apparatus</b> for the transmission of electricity to or from the <b>National Electricity Transmission System</b> or a <b>User System</b> into or out of an <b>External System</b> . For the avoidance of doubt, a single <b>External Interconnection</b> may comprise several circuits operating in parallel.
<b>External Interconnection Circuit</b>	<b>Plant</b> or <b>Apparatus</b> which comprises a circuit and which operates in parallel with another circuit and which forms part of the <b>External Interconnection</b> .
<b>Externally Interconnected System Operator</b> or EISO	A person who operates an <b>External System</b> which is connected to the <b>National Electricity Transmission System</b> or a <b>User System</b> by an <b>External Interconnection</b> .
<b>External System</b>	In relation to an <b>Externally Interconnected System Operator</b> means the transmission or distribution system which it owns or operates which is located outside the <b>National Electricity Transmission System Operator Area</b> any <b>Apparatus</b> or <b>Plant</b> which connects that system to the <b>External Interconnection</b> and which is owned or operated by such <b>Externally Interconnected System Operator</b> .
<b>Fast Fault Current</b>	A current delivered by a <b>Power Park Module</b> or <b>HVDC System</b> during and after a voltage deviation caused by an electrical fault within the <b>System</b> with the aim of identifying a fault by network <b>Protection</b> systems at the initial stage of the fault, supporting <b>System</b> voltage retention at a later stage of the fault and <b>System</b> voltage restoration after fault clearance.
<b>Fault Current Interruption Time</b>	The time interval from fault inception until the end of the break time of the circuit breaker (as declared by the manufacturers).
<b>Fault Ride Through</b>	The <b>capability</b> of <b>Power Generating Modules</b> (including <b>DC Connected Power Park Modules</b> ) and <b>HVDC Systems</b> to be able to be able to remain connected to the <b>System</b> and operate through periods of low voltage at the <b>Grid Entry Point</b> or <b>User System Entry Point</b> caused by secured faults
<b>Fast Start</b>	A start by a <b>Genset</b> with a <b>Fast Start Capability</b> .
<b>Fast Start Capability</b>	The ability of a <b>Genset</b> to be <b>Synchronised</b> and <b>Loaded</b> up to full <b>Load</b> within 5 minutes.

<b>Fast Track Criteria</b>	<p>A proposed Grid Code Modification Proposal that, if implemented,</p> <p>(a) would meet the <b>Self-Governance Criteria</b>; and</p> <p>(b) is properly a housekeeping modification required as a result of some error or factual change, including but not limited to:</p> <p>(i) updating names or addresses listed in the <b>Grid Code</b>;</p> <p>(ii) correcting any minor typographical errors;</p> <p>(iii) correcting formatting and consistency errors, such as paragraph numbering; or</p> <p>(iv) updating out of date references to other documents or paragraphs</p>
<b>Final Generation Outage Programme</b>	<p>An outage programme as agreed by <b>NGET</b> with each <b>Generator</b> and each <b>Interconnector Owner</b> at various stages through the <b>Operational Planning Phase</b> and <b>Programming Phase</b> which does not commit the parties to abide by it, but which at various stages will be used as the basis on which <b>National Electricity Transmission System</b> outages will be planned.</p>
<b>Final Operational Notification or FON</b>	<p>A notification from <b>NGET</b> to a <b>Generator</b> or <b>DC Converter Station</b> owner or <b>HVDC System Owner</b> confirming that the <b>User</b> has demonstrated compliance:</p> <p>(a) with the Grid Code, (or where they apply, that relevant derogations have been granted), and</p> <p>(b) where applicable, with Appendices F1 to F5 of the <b>Bilateral Agreement</b>,</p> <p>in each case in respect of the <b>Plant</b> and <b>Apparatus</b> specified in such notification.</p>
<b>Final Physical Notification Data</b>	<p>Has the meaning set out in the <b>BSC</b>.</p>
<b>Final Report</b>	<p>A report prepared by the <b>Test Proposer</b> at the conclusion of a <b>System Test</b> for submission to <b>NGET</b> (if it did not propose the <b>System Test</b>) and other members of the <b>Test Panel</b>.</p>
<b>Financial Year</b>	<p>Bears the meaning given in Condition A1 (Definitions and Interpretation) of <b>NGET's Transmission Licence</b>.</p>

<b>Fixed Proposed Implementation Date</b>	The proposed date(s) for the implementation of a <b>Grid Code Modification Proposal</b> or <b>Workgroup Alternative Grid Code Modification</b> such date to be a specific date by reference to an assumed date by which a direction from the <b>Authority</b> approving the <b>Grid Code Modification Proposal</b> or <b>Workgroup Alternative Grid Code Modification</b> is required in order for the <b>Grid Code Modification Proposal</b> or any <b>Workgroup Alternative Grid Code Modification</b> , if it were approved, to be implemented by the proposed date.
<b>Flicker Severity (Long Term)</b>	A value derived from 12 successive measurements of <b>Flicker Severity (Short Term)</b> (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 <b>Engineering Recommendation P28</b> as current at the <b>Transfer Date</b> .
<b>Flicker Severity (Short Term)</b>	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 <b>Customer</b> complaints.
<b>Forecast Data</b>	Those items of <b>Standard Planning Data</b> and <b>Detailed Planning Data</b> which will always be forecast.
<b>Frequency</b>	The number of alternating current cycles per second (expressed in Hertz) at which a <b>System</b> is running.
<b>Governor Frequency Response Deadband</b>	An interval used intentionally to make the frequency control unresponsive  In the case of mechanical governor systems the Governor Deadband is the same as Frequency Response Insensitivity
<b>Governor Frequency Response Insensitivity</b>	The inherent feature of the control system specified as the minimum magnitude of change in the frequency or input signal that results in a change of output power or output signal
<b>Frequency Sensitive AGR Unit</b>	Each <b>Generating Unit</b> in an <b>Existing AGR Plant</b> for which the <b>Generator</b> has notified <b>NGET</b> that it has a safety case agreed with the Nuclear Installations Inspectorate enabling it to operate in <b>Frequency Sensitive Mode</b> , to the extent that such unit is within its <b>Frequency Sensitive AGR Unit Limit</b> . Each such <b>Generating Unit</b> shall be treated as if it were operating in accordance with BC3.5.1 provided that it is complying with its <b>Frequency Sensitive AGR Unit Limit</b> .

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



<b>Generating Unit Data</b>	<p>The <b>Physical Notification, Export and Import Limits</b> and <b>Other Relevant Data</b> only in respect of each <b>Generating Unit</b> (which could be part of a <b>Power Generating Module</b>):</p> <p>(a) which forms part of the <b>BM Unit</b> which represents that <b>Cascade Hydro Scheme</b>;</p> <p>(b) at an <b>Embedded Exemptable Large Power Station</b>, where the relevant <b>Bilateral Agreement</b> specifies that compliance with <b>BC1</b> and/or <b>BC2</b> is required:</p> <p>(i) to each <b>Generating Unit</b>, or</p> <p>(ii) to each <b>Power Park Module</b> where the <b>Power Station</b> comprises <b>Power Park Modules</b></p>
<b>Generation Capacity</b>	Has the meaning set out in the <b>BSC</b> .
<b>Generation Planning Parameters</b>	Those parameters listed in Appendix 2 of <b>OC2</b> .
<b>Generator</b>	A person who generates electricity under licence or exemption under the <b>Act</b> acting in its capacity as a generator in <b>Great Britain</b> or <b>Offshore</b> . The term <b>Generator</b> includes a <b>EUNew Generator</b> and an <b>ExistingGB Generator</b> .
<b>Generator Performance Chart</b>	A diagram which shows the MW and Mvar capability limits within which a <b>Generating Unit</b> will be expected to operate under steady state conditions.
<b>Genset</b>	A <b>Power Generating Module</b> (including a <b>DC Connected Power Park Module</b> ), <b>Generating Unit</b> , <b>Power Park Module</b> or <b>CCGT Module</b> at a <b>Large Power Station</b> or any <b>Power Generating Module</b> (including a <b>DC Connected Power Park Module</b> ), <b>Generating Unit</b> , <b>Power Park Module</b> or <b>CCGT Module</b> which is directly connected to the <b>National Electricity Transmission System</b> .
<b>Good Industry Practice</b>	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.
<b>Governance Rules or GR</b>	That portion of the <b>Grid Code</b> which is identified as the <b>Governance Rules</b> .
<b>Governor Deadband</b>	The total magnitude of the change in steady state speed (expressed as a range of Hz ( $\pm x$ 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.
<b>Great Britain or GB</b>	The landmass of England and Wales and Scotland, including internal waters.

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<b>Grid Code Fast Track Proposals</b>	A proposal to modify the <b>Grid Code</b> which is raised pursuant to GR.26 and has not yet been approved or rejected by the <b>Grid Code Review Panel</b> .
<b>Grid Code Modification Fast Track Report</b>	A report prepared pursuant to GR.26
<b>Grid Code Modification Register</b>	Has the meaning given in GR.13.1.
<b>Grid Code Modification Report</b>	Has the meaning given in GR.22.1.
<b>Grid Code Modification Procedures</b>	The procedures for the modification of the <b>Grid Code</b> (including the implementation of <b>Approved Modifications</b> ) as set out in the <b>Governance Rules</b> .
<b>Grid Code Modification Proposal</b>	A proposal to modify the <b>Grid Code</b> which is not yet rejected pursuant to GR.15.5 or GR.15.6 and has not yet been implemented.
<b>Grid Code Modification Self- Governance Report</b>	Has the meaning given in GR.24.5
<b>Grid Code Objectives</b>	Means the objectives referred to in Paragraph 1b of Standard Condition C14 of <b>NGET's Transmission Licence</b> .
<b>Grid Code Review Panel or Panel</b>	The panel with the functions set out in GR.1.2.
<b>Grid Code Review Panel Recommendation Vote</b>	The vote of <b>Panel Members</b> undertaken by the <b>Panel Chairman</b> in accordance with Paragraph GR.22.4 as to whether in their view they believe each proposed <b>Grid Code Modification Proposal</b> , or <b>Workgroup Alternative Grid Code Modification</b> would better facilitate achievement of the <b>Grid Code Objective(s)</b> and so should be made.
<b>Grid Code Review Panel Self-Governance Vote</b>	The vote of <b>Panel Members</b> undertaken by the <b>Panel Chairman</b> in accordance with GR.24.9 as to whether they believe each proposed Grid Code Modification Proposal, as compared with the then existing provisions of the <b>Grid Code</b> and any <b>Workgroup Alternative Grid Code Modification</b> set out in the <b>Grid Code Modification Self- Governance Report</b> , would better facilitate achievement of the <b>Grid Code Objective(s)</b> .
<b>Grid Code Self-Governance Proposals</b>	<b>Grid Code Modification Proposals</b> which satisfy the <b>Self Governance Criteria</b> .
<b>Grid Entry Point</b>	An <b>Onshore Grid Entry Point</b> or an <b>Offshore Grid Entry Point</b> .
<b>Grid Supply Point</b>	A point of supply from the <b>National Electricity Transmission System</b> to <b>Network Operators</b> or <b>Non-Embedded Customers</b> .

<b>Group</b>	Those <b>National Electricity Transmission System</b> sub-stations bounded solely by the faulted circuit(s) and the overloaded circuit(s) excluding any third party connections between the <b>Group</b> and the rest of the <b>National Electricity Transmission System</b> , the faulted circuit(s) being a <b>Secured Event</b> .
<b>Headroom</b>	The <b>Power Available</b> (in MW) less the actual <b>Active Power</b> exported from the <b>Power Park Module</b> (in MW).
<b>High Frequency Response</b>	An automatic reduction in <b>Active Power</b> output in response to an increase in <b>System Frequency</b> above the <b>Target Frequency</b> (or such other level of <b>Frequency</b> as may have been agreed in an <b>Ancillary Services Agreement</b> ). This reduction in <b>Active Power</b> output must be in accordance with the provisions of the relevant <b>Ancillary Services Agreement</b> which will provide that it will be released increasingly with time over the period 0 to 10 seconds from the time of the <b>Frequency</b> increase on the basis set out in the <b>Ancillary Services Agreement</b> and fully achieved within 10 seconds of the time of the start of the <b>Frequency</b> increase and it must be sustained at no lesser reduction thereafter. The interpretation of the <b>High Frequency Response</b> to a + 0.5 Hz frequency change is shown diagrammatically in Figure CC.A.3.3.
<b>High Voltage or HV</b>	For <b>E&amp;W Transmission Systems</b> , a voltage exceeding 650 volts. For <b>Scottish Transmission Systems</b> , a voltage exceeding 1000 volts.
<b>Houseload Operation</b>	Operation which ensures that a <b>Power Station</b> is able to continue to supply its in-house load in the event of <b>System</b> faults resulting in <b>Power-Generating Modules</b> being disconnected from the <b>System</b> and tripped onto their auxiliary supplies
<b>HV Connections</b>	<b>Apparatus</b> connected at the same voltage as that of the <b>National Electricity Transmission System</b> , including <b>Users'</b> circuits, the higher voltage windings of <b>Users'</b> transformers and associated connection <b>Apparatus</b> .
<b>HVDC Converter</b>	Any <b>EU CodeNew User Apparatus</b> used to convert alternating current electricity to direct current electricity, or vice versa. An <b>HVDC Converter</b> is a standalone operative configuration at a single site comprising one or more converter bridges, together with one or more converter transformers, reactors, converter control equipment, essential protective and switching devices and auxiliaries, if any, used for conversion. In a bipolar arrangement, an <b>HVDC Converter</b> represents the bipolar configuration.
<b>HVDC Converter Station</b>	Part of an <b>HVDC System</b> which consists of one or more <b>HVDC Converters</b> installed in a single location together with buildings, reactors, filters reactive power devices, control, monitoring, protective, measuring and auxiliary equipment.
<b>HVDC Equipment</b>	Collectively means an <b>HVDC System</b> and a <b>DC Connected Power Park Module</b> and a <b>Remote End HVDC Converter Station</b> .

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<b>HVDC Interface Point</b>	A point at which <b>HVDC Plant</b> and <b>Apparatus</b> <del>equipment</del> is connected to an AC <b>System</b> at which technical specifications affecting the performance of the <del>equipment</del> <b>Plant</b> and <b>Apparatus</b> can be prescribed.
<b>HVDC System</b>	An electrical power system which transfers energy in the form of high voltage direct current between two or more alternating current (AC) buses and comprises at least two <b>HVDC Converter Stations</b> with DC <b>Transmission</b> lines or cables between the <b>HVDC Converter Stations</b> .
<b>HVDC System Owner</b>	A party who owns and is responsible for an <b>HVDC System</b> . For the avoidance of doubt a <b>DC Connected Power Park Module</b> owner would be treated as a <b>Generator</b> .
<b>HV Generator Performance Chart</b>	<del>A diagram showing the <b>Real Power</b> (MW) and <b>Reactive Power</b> (MVAR) capability limits within which a <b>Synchronous Power Generating Module</b> or <b>Power Park Module</b> at its <b>Grid Entry Point</b> or <b>User System Entry Point</b> will be expected to operate under steady state conditions.</del>
<b>HP Turbine Power Fraction</b>	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 <b>Registered Capacity</b> or <b>Maximum Capacity</b> .
<b>IEC</b>	International Electrotechnical Commission.
<b>IEC Standard</b>	A standard approved by the International Electrotechnical Commission.
<b>Implementation Date</b>	Is the date and time for implementation of an <b>Approved Modification</b> as specified in accordance with Paragraph GR.25.3.
<b>Implementing Safety Co-ordinator</b>	The <b>Safety Co-ordinator</b> implementing <b>Safety Precautions</b> .
<b>Import Usable</b>	That portion of <b>Registered Import Capacity</b> which is expected to be available and which is not unavailable due to a <b>Planned Outage</b> .
<b>Incident Centre</b>	A centre established by <b>NGET</b> or a <b>User</b> as the focal point in <b>NGET</b> or in that <b>User</b> , as the case may be, for the communication and dissemination of information between the senior management representatives of <b>NGET</b> , or of that <b>User</b> , as the case may be, and the relevant other parties during a <b>Joint System Incident</b> in order to avoid overloading <b>NGET's</b> , or that <b>User's</b> , as the case may be, existing operational/control arrangements.
<b>Independent Back-Up Protection</b>	A <b>Back-Up Protection</b> system which utilises a discrete relay, different current transformers and an alternate operating principle to the <b>Main Protection</b> systems(s) such that it can operate autonomously in the event of a failure of the <b>Main Protection</b> .
<b>Independent Main Protection</b>	A <b>Main Protection</b> system which utilises a physically discrete relay and different current transformers to any other <b>Main Protection</b> .
<b>Indicated Constraint Boundary Margin</b>	The difference between a constraint boundary transfer limit and the difference between the sum of <b>BM Unit</b> Maximum Export Limits and the forecast of local <b>Demand</b> within the constraint boundary.

Comment [NG7]: Check Definition for HVDC

<b>Indicated Imbalance</b>	The difference between the sum of <b>Physical Notifications</b> for <b>BM Units</b> comprising <b>Generating Units</b> or <b>CCGT Modules</b> or <b>Power Generating Modules</b> and the forecast of <b>Demand</b> for the whole or any part of the <b>System</b> .
<b>Indicated Margin</b>	The difference between the sum of <b>BM Unit</b> Maximum Export Limits submitted and the forecast of <b>Demand</b> for the whole or any part of the <b>System</b>
<b>Installation Document</b>	A simple structured document containing information about a <b>Type A Power Generating Module</b> or a <b>Demand Unit</b> , with demand response connected below 1000 V, and confirming its compliance with the relevant requirements;
<b>Instructor Facilities</b>	A device or system which gives certain <b>Transmission Control Centre</b> instructions with an audible or visible alarm, and incorporates the means to return message acknowledgements to the <b>Transmission Control Centre</b>
<b>Integral Equipment Test or IET</b>	A test on equipment, associated with <b>Plant</b> and/or <b>Apparatus</b> , which takes place when that <b>Plant</b> and/or <b>Apparatus</b> forms part of a <b>Synchronised System</b> and which, in the reasonable judgement of the person wishing to perform the test, may cause an <b>Operational Effect</b> .
<b>Intellectual Property" or "IPRs</b>	Patents, trade marks, service marks, rights in designs, trade names, copyrights and topography rights (whether or not any of the same are registered and including applications for registration of any of the same) and rights under licences and consents in relation to any of the same and all rights or forms of protection of a similar nature or having equivalent or similar effect to any of the same which may subsist anywhere in the world.
<b>Interconnection Agreement</b>	An agreement made between <b>NGET</b> and an <b>Externally Interconnected System Operator</b> and/or an <b>Interconnector User</b> and/or other relevant persons for the <b>External Interconnection</b> relating to an <b>External Interconnection</b> and/or an agreement under which an <b>Interconnector User</b> can use an <b>External Interconnection</b> .
<b>Interconnector Export Capacity</b>	In relation to an <b>External Interconnection</b> means the (daily or weekly) forecast value (in MW) at the time of the (daily or weekly) peak demand, of the maximum level at which the <b>External Interconnection</b> can export to the <b>Grid Entry Point</b> .
<b>Interconnector Import Capacity</b>	In relation to an <b>External Interconnection</b> means the (daily or weekly) forecast value (in MW) at the time of the (daily or weekly) peak demand of the maximum level at which the <b>External Interconnection</b> can import from the <b>Grid Entry Point</b> .
<b>Interconnector Owner</b>	Has the meaning given to the term in the <b>Connection and Use of System Code</b> .

<b>Interconnector User</b>	Has the meaning set out in the <b>BSC</b> .
<b>Interface Agreement</b>	Has the meaning set out in the <b>CUSC</b> .
<b>Interface Point</b>	As the context admits or requires either; (a) the electrical point of connection between an <b>Offshore Transmission System</b> and an <b>Onshore Transmission System</b> , or (b) the electrical point of connection between an <b>Offshore Transmission System</b> and a <b>Network Operator's User System</b> .
<b>Interface Point Capacity</b>	The maximum amount of <b>Active Power</b> transferable at the <b>Interface Point</b> as declared by a <b>User</b> under the <b>OTSDUW Arrangements</b> expressed in whole MW.
<b>Interface Point Target Voltage/Power factor</b>	The nominal target voltage/power factor at an <b>Interface Point</b> which a <b>Network Operator</b> requires <b>NGET</b> to achieve by operation of the relevant <b>Offshore Transmission System</b> .
<b>Interim Operational Notification or ION</b>	A notification from <b>NGET</b> to a <b>Generator</b> or <b>DC Converter Station</b> owner or <b>HVDC System Operator</b> acknowledging that the <b>User</b> has demonstrated compliance, except for the <b>Unresolved Issues</b> ; (a) with the Grid Code, and (b) where applicable, with Appendices F1 to F5 of the <b>Bilateral Agreement</b> , in each case in respect of the <b>Plant</b> and <b>Apparatus</b> (including <b>OTSUA</b> ) specified in such notification and provided that in the case of the <b>OTSDUW Arrangements</b> such notification shall be provided to a <b>Generator</b> in two parts dealing with the <b>OTSUA</b> and <b>Generator's Plant</b> and <b>Apparatus</b> (called respectively " <b>Interim Operational Notification Part A</b> " or " <b>ION A</b> " and " <b>Interim Operational Notification Part B</b> " or " <b>ION B</b> ") as provided for in the <b>CP</b> .
<b>Intermittent Power Source</b>	The primary source of power for a <b>Generating Unit</b> or <b>Power Generating Module</b> that can not be considered as controllable, e.g. wind, wave or solar.
<b>Intertripping</b>	(a) The tripping of circuit-breaker(s) by commands initiated from <b>Protection</b> at a remote location independent of the state of the local <b>Protection</b> ; or (b) <b>Operational Intertripping</b> .
<b>Intertrip Apparatus</b>	<b>Apparatus</b> which performs <b>Intertripping</b> .
<b>IP Turbine Power Fraction</b>	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 <b>Registered Capacity</b> or <b>Maximum Capacity</b> .
<b>Isolating Device</b>	A device for achieving <b>Isolation</b> .

<b>Isolation</b>	<p>The disconnection of <b>HV Apparatus</b> (as defined in OC8A.1.6.2 and OC8B.1.7.2) from the remainder of the <b>System</b> in which that <b>HV Apparatus</b> is situated by either of the following:</p> <p>(a) an <b>Isolating Device</b> maintained in an isolating position. The isolating position must either be:</p> <p>(i) maintained by immobilising and <b>Locking</b> the <b>Isolating Device</b> in the isolating position and affixing a <b>Caution Notice</b> to it. Where the <b>Isolating Device</b> is <b>Locked</b> with a <b>Safety Key</b>, the <b>Safety Key</b> must be secured in a <b>Key Safe</b> and the <b>Key Safe Key</b> must be, where reasonably practicable, given to the authorised site representative of the <b>Requesting Safety Co-Ordinator</b> and is to be retained in safe custody. Where not reasonably practicable the <b>Key Safe Key</b> must be retained by the authorised site representative of the <b>Implementing Safety Co-ordinator</b> in safe custody; or</p> <p>(ii) maintained and/or secured by such other method which must be in accordance with the <b>Local Safety Instructions of NGET</b> or the <b>Safety Rules</b> of the <b>Relevant Transmission Licensee</b> or that <b>User</b>, as the case may be; or</p> <p>(b) an adequate physical separation which must be in accordance with and maintained by the method set out in the <b>Local Safety Instructions of NGET</b> or the <b>Safety Rules</b> of the <b>Relevant Transmission Licensee</b> or that <b>User</b>, as the case may be.</p>
<b>Joint BM Unit Data</b>	Has the meaning set out in the <b>BSC</b> .
<b>Joint System Incident</b>	An <b>Event</b> wherever occurring (other than on an <b>Embedded Medium Power Station</b> or an <b>Embedded Small Power Station</b> ) which, in the opinion of <b>NGET</b> or a <b>User</b> , has or may have a serious and/or widespread effect, in the case of an <b>Event</b> on a <b>User(s) System(s)</b> (other than on an <b>Embedded Medium Power Station</b> or <b>Embedded Small Power Station</b> ), on the <b>National Electricity Transmission System</b> , and in the case of an <b>Event</b> on the <b>National Electricity Transmission System</b> , on a <b>User(s) System(s)</b> (other than on an <b>Embedded Medium Power Station</b> or <b>Embedded Small Power Station</b> ).
<b>Key Safe</b>	A device for the secure retention of keys.
<b>Key Safe Key</b>	A key unique at a <b>Location</b> capable of operating a lock, other than a control lock, on a <b>Key Safe</b> .

<p><b>Large Power Station</b></p>	<p>A <b>Power Station</b> which is</p> <p>(a) directly connected to:</p> <ul style="list-style-type: none"> <li>(i) <b>NGET's Transmission System</b> where such <b>Power Station</b> has a <b>Registered Capacity</b> of 100MW or more; or</li> <li>(ii) <b>SPT's Transmission System</b> where such <b>Power Station</b> has a <b>Registered Capacity</b> of 30MW or more; or</li> <li>(iii) <b>SHETL's Transmission System</b> where such <b>Power Station</b> has a <b>Registered Capacity</b> of 10MW or more; or</li> <li>(iv) an <b>Offshore Transmission System</b> where such <b>Power Station</b> has a <b>Registered Capacity</b> of 10MW or more;</li> </ul> <p>or,</p> <p>(b) <b>Embedded</b> within a <b>User System</b> (or part thereof) where such <b>User System</b> (or part thereof) is connected under normal operating conditions to:</p> <ul style="list-style-type: none"> <li>(i) <b>NGET's Transmission System</b> and such <b>Power Station</b> has a <b>Registered Capacity</b> of 100MW or more; or</li> <li>(ii) <b>SPT's Transmission System</b> and such <b>Power Station</b> has a <b>Registered Capacity</b> of 30MW or more; or</li> <li>(iii) <b>SHETL's Transmission System</b> and such <b>Power Station</b> has a <b>Registered Capacity</b> of 10MW or more;</li> </ul> <p>or,</p> <p>(c) <b>Embedded</b> within a <b>User System</b> (or part thereof) where the <b>User System</b> (or part thereof) is not connected to the <b>National Electricity Transmission System</b>, although such <b>Power Station</b> is in:</p> <ul style="list-style-type: none"> <li>(i) <b>NGET's Transmission Area</b> where such <b>Power Station</b> has a <b>Registered Capacity</b> of 100MW or more; or</li> <li>(ii) <b>SPT's Transmission Area</b> where such <b>Power Station</b> has a <b>Registered Capacity</b> of 30MW or more; or</li> <li>(iii) <b>SHETL's Transmission Area</b> where such <b>Power Station</b> has a <b>Registered Capacity</b> of 10MW or more;</li> </ul> <p>For the avoidance of doubt a <b>Large Power Station</b> could comprise of <b>Type A, Type B, Type C</b> or <b>Type D Power Generating Modules</b>.</p>
<p><b>Legal Challenge</b></p>	<p>Where permitted by law a judicial review in respect of the <b>Authority's</b> decision to approve or not to approve a <b>Grid Code Modification Proposal</b>.</p>
<p><b>Licence</b></p>	<p>Any licence granted to <b>NGET</b> or a <b>Relevant Transmission Licensee</b> or a <b>User</b>, under Section 6 of the <b>Act</b>.</p>

**Comment [NG8]:** House keeping change - space added

<b>Licence Standards</b>	Those standards set out or referred to in Condition C17 of <b>NGET's Transmission Licence</b> and/or Condition D3 and/or Condition E16 of a <b>Relevant Transmission Licensee's Transmission Licence</b> .
<b>Limited Frequency Sensitive Mode</b>	A mode whereby the operation of the <b>Genset</b> or <b>Power Generating Module</b> (or <b>DC Converter</b> at a <b>DC Converter Station</b> or <b>HVDC Systems</b> exporting <b>Active Power</b> to the <b>Total System</b> ) is <b>Frequency</b> insensitive except when the <b>System Frequency</b> exceeds 50.4Hz, from which point <b>Limited High Frequency Response</b> must be provided. For <b>Power Generating Modules</b> (including <b>DC Connected Power Park Modules</b> ) and <b>HVDC Systems</b> , operation in <b>Limited Frequency Sensitive Mode</b> would require <b>Limited Frequency Sensitive Mode – Overfrequency (LFSM-O)</b> capability and <b>Limited Frequency Sensitive Mode – Underfrequency (LFSM-U)</b> capability.
<b>Limited Frequency Sensitive Mode – Overfrequency or LFSM-O</b>	A <b>Power Generating Module</b> (including a <b>DC Connected Power Park Module</b> ) or <b>HVDC System</b> operating mode which will result in <b>Active Power</b> output reduction in response to a change in <b>System Frequency</b> above a certain value.
<b>Limited Frequency Sensitive Mode – Underfrequency or LFSM-U</b>	A <b>Power Generating Module</b> (including a <b>DC Connected Power Park Module</b> ) or <b>HVDC System</b> operating mode which will result in <b>Active Power</b> output increase in response to a change in <b>System Frequency</b> below a certain value.
<b>Limited High Frequency Response</b>	A response of a <b>Genset</b> (or <b>DC Converter</b> at a <b>DC Converter Station</b> exporting <b>Active Power</b> to the <b>Total System</b> ) to an increase in <b>System Frequency</b> above 50.4Hz leading to a reduction in <b>Active Power</b> in accordance with the provisions of BC3.7.2.1
<b>Limited Operational Notification or LON</b>	A notification from <b>NGET</b> to a <b>Generator</b> or <b>DC Converter Station</b> owner or <b>HVDC System Owner</b> stating that the <b>User's Plant</b> and/or <b>Apparatus</b> specified in such notification may be, or is, unable to comply:  (a) with the provisions of the Grid Code specified in the notice, and (b) where applicable, with Appendices F1 to F5 of the <b>Bilateral Agreement</b> ,  and specifying the <b>Unresolved Issues</b> .
<b>Load</b>	The <b>Active, Reactive</b> or <b>Apparent Power</b> , as the context requires, generated, transmitted or distributed.
<b>Loaded</b>	Supplying electrical power to the <b>System</b> .
<b>Load Factor</b>	The ratio of the actual output of a <b>Generating Unit</b> or <b>Power Generating Module</b> to the possible maximum output of that <b>Generating Unit</b> or <b>Power Generating Module</b> .
<b>Load Management Block</b>	A block of <b>Demand</b> controlled by a <b>Supplier</b> or other party through the means of radio teleswitching or by some other means.

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<b>Local Joint Restoration Plan</b>	<p>A plan produced under OC9.4.7.12 detailing the agreed method and procedure by which a <b>Genset</b> at a <b>Black Start Station</b> (possibly with other <b>Gensets</b> at that <b>Black Start Station</b>) will energise part of the <b>Total System</b> and meet complementary blocks of local <b>Demand</b> so as to form a <b>Power Island</b>.</p> <p>In Scotland, the plan may also: cover more than one <b>Black Start Station</b>; include <b>Gensets</b> other than those at a <b>Black Start Station</b> and cover the creation of one or more <b>Power Islands</b>.</p>
<b>Local Safety Instructions</b>	<p>For safety co-ordination in England and Wales, instructions on each <b>User Site</b> and <b>Transmission Site</b>, approved by the relevant <b>NGET</b> or <b>User's</b> manager, setting down the methods of achieving the objectives of <b>NGET's</b> or the <b>User's Safety Rules</b>, as the case may be, to ensure the safety of personnel carrying out work or testing on <b>Plant</b> and/or <b>Apparatus</b> on which his <b>Safety Rules</b> apply and, in the case of a <b>User</b>, any other document(s) on a <b>User Site</b> which contains rules with regard to maintaining or securing the isolating position of an <b>Isolating Device</b>, or maintaining a physical separation or maintaining or securing the position of an <b>Earthing Device</b>.</p>
<b>Local Switching Procedure</b>	<p>A procedure produced under OC7.6 detailing the agreed arrangements in respect of carrying out of <b>Operational Switching</b> at <b>Connection Sites</b> and parts of the <b>National Electricity Transmission System</b> adjacent to those <b>Connection Sites</b>.</p>
<b>Localised Negative Reserve Active Power Margin or Localised NRAPM</b>	<p>That margin of <b>Active Power</b> sufficient to allow transfers to and from a <b>System Constraint Group</b> (as the case may be) to be contained within such reasonable limit as <b>NGET</b> may determine.</p>
<b>Location</b>	<p>Any place at which <b>Safety Precautions</b> are to be applied.</p>
<b>Locked</b>	<p>A condition of <b>HV Apparatus</b> that cannot be altered without the operation of a locking device.</p>
<b>Locking</b>	<p>The application of a locking device which enables <b>HV Apparatus</b> to be <b>Locked</b>.</p>
<b>Low Frequency Relay</b>	<p>Has the same meaning as <b>Under Frequency Relay</b>.</p>
<b>Low Voltage or LV</b>	<p>For <b>E&amp;W Transmission Systems</b> a voltage not exceeding 250 volts. For <b>Scottish Transmission Systems</b>, a voltage exceeding 50 volts but not exceeding 1000 volts.</p>
<b>LV Side of the Offshore Platform</b>	<p>Unless otherwise specified in the <b>Bilateral Agreement</b>, the busbar on the <b>Offshore Platform</b> (typically 33kV) at which the relevant <b>Offshore Grid Entry Point</b> is located.</p>

<b>LV Synchronous Generating Unit Performance Chart</b>	A diagram showing the <b>Real Power</b> (MW) and <b>Reactive Power</b> (MVAR) capability limits within which a <b>Synchronous Generating Unit</b> at its stator terminals will be expected to operate under steady state conditions.
<b>Main Plant and Apparatus</b>	<p>In respect of a <b>Power Station</b> (including <b>Power Stations</b> comprising of <b>DC Connected Power Park Modules</b>) is one <b>or more of the principle items of Plant or Apparatus required to convert thea primary source of energy source into electricity</b>, (including for example at least the <b>Generating Unit</b>, turbine or power electronic conversion equipment which forms part of a <b>Power Generating Module, Generating Unit or Power Park Module</b>).</p> <p>In respect of <b>HVDC Systems</b> or <b>DC Converters</b> or <b>Transmission DC Converters</b> is one of the principle items of <b>Plant or Apparatus</b> used to convert high voltage direct current to high voltage alternating current or visa versa (including for example at least the converter bridges or converter transformers and associated equipment).</p> <p>In respect of a <b>Network Operator, Non Embedded Customer or Demand Facility</b> is one of the principle items of <b>Plant or Apparatus</b> and would include at least one of the following items: motors, transformers, high voltage equipment at the connection point and at the process production plant.</p>
<b>Main Protection</b>	A <b>Protection</b> system which has priority above other <b>Protection</b> in initiating either a fault clearance or an action to terminate an abnormal condition in a power system.
<b>Manufacturer's Data &amp; Performance Report</b>	A report submitted by a manufacturer to <b>NGET</b> relating to a specific version of a <b>Power Park Unit</b> demonstrating the performance characteristics of such <b>Power Park Unit</b> in respect of which <b>NGET</b> has evaluated its relevance for the purposes of the <b>Compliance Processes</b> .
<b>Manufacturer's Test Certificates</b>	A certificate prepared by a manufacturer which demonstrates that its <b>Power Generating Module</b> has undergone appropriate tests and conforms to the performance requirements expected by <b>NGET</b> in satisfying its compliance requirements and thereby satisfies the appropriate requirments of the Grid Code and <b>Bilateral Agreement</b> .
<b>Market Operation Data Interface System (MODIS)</b>	A computer system operated by <b>NGET</b> and made available for use by <b>Customers</b> connected to or using the <b>National Electricity Transmission System</b> for the purpose of submitting <b>EU Transparency Availability Data</b> to <b>NGET</b> .
<b>Market Suspension Threshold</b>	Has the meaning given to the term 'Market Suspension Threshold' in Section G of the <b>BSC</b> .

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Comment [NG9]: This is an issue for GC0104

<b>Material Effect</b>	An effect causing <b>NGET</b> or a <b>Relevant Transmission Licensee</b> to effect any works or to alter the manner of operation of <b>Transmission Plant</b> and/or <b>Transmission Apparatus</b> at the <b>Connection Site</b> (which term shall, in this definition and in the definition of “ <b>Modification</b> ” only, have the meaning ascribed thereto in the <b>CUSC</b> ) or the site of connection or a <b>User</b> to effect any works or to alter the manner of operation of its <b>Plant</b> and/or <b>Apparatus</b> at the <b>Connection Site</b> or the site of connection which in either case involves that party in expenditure of more than £10,000.
<b>Materially Affected Party</b>	Any person or class of persons designated by the <b>Authority</b> as such.
<b>Maximum Export Capacity</b>	The maximum continuous <b>Apparent Power</b> expressed in MVA and maximum continuous <b>Active Power</b> expressed in MW which can flow from an <b>Offshore Transmission System</b> connected to a <b>Network Operator's User System</b> , to that <b>User System</b> .
<b>Maximum Capacity or P<sub>max</sub></b>	The maximum continuous <b>Active Power</b> which a <b>Power Generating Module</b> can produce, less any demand associated solely with facilitating the operation of that <b>Power Generating Module</b> and not fed into the <b>System</b> .
<b>Maximum Generation Service or MGS</b>	A service utilised by <b>NGET</b> in accordance with the <b>CUSC</b> and the <b>Balancing Principles Statement</b> in operating the <b>Total System</b> .
<b>Maximum Generation Service Agreement</b>	An agreement between a <b>User</b> and <b>NGET</b> for the payment by <b>NGET</b> to that <b>User</b> in respect of the provision by such <b>User</b> of a <b>Maximum Generation Service</b> .
<b>Maximum HVDC Active Power Transmission Capacity<sup>2</sup> (PHmax)</b>	The maximum continuous <b>Active Power</b> which an <b>HVDC System</b> can exchange with the network at each <b>Grid Entry Point</b> or <b>User System Entry Point</b> as specified in the <b>Bilateral Agreement</b> or as agreed between <b>NGET</b> and the <b>HVDC System Owner</b> .
<b>Maximum Import Capacity</b>	The maximum continuous <b>Apparent Power</b> expressed in MVA and maximum continuous <b>Active Power</b> expressed in MW which can flow to an <b>Offshore Transmission System</b> connected to a <b>Network Operator's User System</b> , from that <b>User System</b> .

<b>Medium Power Station</b>	<p>A <b>Power Station</b> which is</p> <p>(a) directly connected to <b>NGET's Transmission System</b> where such <b>Power Station</b> has a <b>Registered Capacity</b> of 50MW or more but less than 100MW;</p> <p>or,</p> <p>(b) <b>Embedded</b> within a <b>User System</b> (or part thereof) where such <b>User System</b> (or part thereof) is connected under normal operating conditions to <b>NGET's Transmission System</b> and such <b>Power Station</b> has a <b>Registered Capacity</b> of 50MW or more but less than 100MW;</p> <p>or,</p> <p>(c) <b>Embedded</b> within a <b>User System</b> (or part thereof) where the <b>User System</b> (or part thereof) is not connected to the <b>National Electricity Transmission System</b>, although such <b>Power Station</b> is in <b>NGET's Transmission Area</b> and such <b>Power Station</b> has a <b>Registered Capacity</b> of 50MW or more but less than 100MW.</p> <p>For the avoidance of doubt a <b>Medium Power Station</b> could comprise of <b>Type A, Type B, Type C</b> or <b>Type D Power Generating Modules</b>.</p>
<b>Medium Voltage or MV</b>	For <b>E&amp;W Transmission Systems</b> a voltage exceeding 250 volts but not exceeding 650 volts.
<b>Mills</b>	Milling plant which supplies pulverised fuel to the boiler of a coal fired <b>Power Station</b> .
<b>Minimum Generation</b>	The minimum output (in whole MW) which a <b>Genset</b> can generate or <b>DC Converter</b> at a <b>DC Converter Station</b> can import or export to the <b>Total System</b> under stable operating conditions, as registered with <b>NGET</b> under the <b>PC</b> (and amended pursuant to the <b>PC</b> ). For the avoidance of doubt, the output may go below this level as a result of operation in accordance with BC3.7.
<b>Minimum Active Power Transmission Capacity' (PHmin)</b>	The minimum continuous <b>Active Power</b> which an <b>HVDC System</b> can exchange with the System at each <b>Grid Entry Point</b> or <b>User System Entry Point</b> as specified in the <b>Bilateral Agreement</b> or as agreed between <b>NGET</b> and the <b>HVDC System Owner</b>
<b>Minimum Import Capacity</b>	The minimum input (in whole MW) into a <b>DC Converter</b> at a <b>DC Converter Station</b> or <b>HVDC System</b> at an <b>HVDC Converter</b> (in any of its operating configurations) at the <b>Onshore Grid Entry Point</b> (or in the case of an <b>Embedded DC Converter</b> or an <b>Embedded HVDC Converter</b> at the <b>User System Entry Point</b> ) at which a <b>DC Converter</b> or <b>HVDC Converter</b> can operate in a stable manner, as registered with <b>NGET</b> under the <b>PC</b> (and amended pursuant to the <b>PC</b> ).

<b>Minimum Regulating Level</b>	The minimum <b>Active Power</b> , as specified in the <b>Bilateral Agreement</b> or as agreed between <b>NGET</b> and the <b>Generator</b> , down to which the <b>Power Generating Module</b> can control <b>Active Power</b> ;
<b>Minimum Stable Operating Level</b>	The minimum <b>Active Power</b> , as specified in the <b>Bilateral Agreement</b> or as agreed between <b>NGET</b> and the <b>Generator</b> , at which the <b>Power Generating Module</b> can be operated stably for an unlimited time.
<b>Modification</b>	Any actual or proposed replacement, renovation, modification, alteration or construction by or on behalf of a <b>User</b> or <b>NGET</b> to either that <b>User's Plant</b> or <b>Apparatus</b> or <b>Transmission Plant</b> or <b>Apparatus</b> , as the case may be, or the manner of its operation which has or may have a <b>Material Effect</b> on <b>NGET</b> or a <b>User</b> , as the case may be, at a particular <b>Connection Site</b> .
<b>Mothballed DC Connected Power Park Module</b>	<u>A <b>DC Connected Power Park Module</b> that has previously generated which the <b>Generator</b> plans not to use to generate for the remainder of the current <b>Financial Year</b> but which could be returned to service.</u>
<b>Mothballed DC Converter at a DC Converter Station</b>	A <b>DC Converter</b> at a <b>DC Converter Station</b> that has previously imported or exported power which the <b>DC Converter Station</b> owner plans not to use to import or export power for the remainder of the current <b>Financial Year</b> but which could be returned to service.
<b>Mothballed HVDC System</b>	<u>An <b>HVDC System</b> that has previously imported or exported power which the <b>HVDC System Owner</b> plans not to use to import or export power for the remainder of the current <b>Financial Year</b> but which could be returned to service.</u>
<b>Mothballed HVDC Converter at a HVDC Converter Station</b>	An <b>HVDC Converter</b> which is part of an <b>HVDC System</b> at a <b>HVDC Converter Station</b> that has previously imported or exported power which the <b>HVDC System Owner</b> plans not to use to import or export power for the remainder of the current <b>Financial Year</b> but which could be returned to service.
<b>Mothballed Generating Unit</b>	A <b>Generating Unit</b> that has previously generated which the <b>Generator</b> plans not to use to generate for the remainder of the current <b>Financial Year</b> but which could be returned to service. For the avoidance of doubt a <b>Mothballed Generating Unit</b> could be part of a <b>Power Generating Module</b> .
<b>Mothballed Power Generating Module</b>	A <b>Power Generating Module</b> that has previously generated which the <b>Generator</b> plans not to use to generate for the remainder of the current <b>Financial Year</b> but which could be returned to service.
<b>Mothballed Power Park Module</b>	A <b>Power Park Module</b> that has previously generated which the <b>Generator</b> plans not to use to generate for the remainder of the current <b>Financial Year</b> but which could be returned to service.
<b>Multiple Point of Connection</b>	A double (or more) <b>Point of Connection</b> , being two (or more) <b>Points of Connection</b> interconnected to each other through the <b>User's System</b> .

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<b>National Demand</b>	<p>The amount of electricity supplied from the <b>Grid Supply Points</b> plus:-</p> <ul style="list-style-type: none"> <li>• that supplied by <b>Embedded Large Power Stations</b>, and</li> <li>• <b>National Electricity Transmission System Losses</b>,</li> </ul> <p>minus:-</p> <ul style="list-style-type: none"> <li>• the <b>Demand</b> taken by <b>Station Transformers</b> and <b>Pumped Storage Units</b>'</li> </ul> <p>and, for the purposes of this definition, does not include:-</p> <ul style="list-style-type: none"> <li>• any exports from the <b>National Electricity Transmission System</b> across <b>External Interconnections</b>.</li> </ul>
<b>National Electricity Transmission System</b>	The <b>Onshore Transmission System</b> and, where owned by <b>Offshore Transmission Licensees</b> , <b>Offshore Transmission Systems</b> .
<b>National Electricity Transmission System Demand</b>	<p>The amount of electricity supplied from the <b>Grid Supply Points</b> plus:-</p> <ul style="list-style-type: none"> <li>• that supplied by <b>Embedded Large Power Stations</b>, and</li> <li>• exports from the <b>National Electricity Transmission System</b> across <b>External Interconnections</b>, and</li> <li>• <b>National Electricity Transmission System Losses</b>,</li> </ul> <p>and, for the purposes of this definition, includes:-</p> <ul style="list-style-type: none"> <li>• the <b>Demand</b> taken by <b>Station Transformers</b> and <b>Pumped Storage Units</b>.</li> </ul>
<b>National Electricity Transmission System Losses</b>	The losses of electricity incurred on the <b>National Electricity Transmission System</b> .
<b>National Electricity Transmission System Operator Area</b>	Has the meaning set out in Schedule 1 of <b>NGET's Transmission Licence</b> .
<b>National Electricity Transmission System Study Network Data File</b>	A computer file produced by <b>NGET</b> which in <b>NGET's</b> view provides an appropriate representation of the <b>National Electricity Transmission System</b> for a specific point in time. The computer file will contain information and data on <b>Demand</b> on the <b>National Electricity Transmission System</b> and on <b>Large Power Stations</b> including <b>Genset</b> power output consistent with <b>Output Usable</b> and <b>NGET's</b> view of prevailing system conditions.

<b>National Electricity Transmission System Warning</b>	A warning issued by <b>NGET</b> to <b>Users</b> (or to certain <b>Users</b> only) in accordance with OC7.4.8.2, which provides information relating to <b>System</b> conditions or <b>Events</b> and is intended to :  (a) alert <b>Users</b> to possible or actual <b>Plant</b> shortage, <b>System</b> problems and/or <b>Demand</b> reductions; (b) inform of the applicable period; (c) indicate intended consequences for <b>Users</b> ; and (d) enable specified <b>Users</b> to be in a state of readiness to receive instructions from <b>NGET</b> .
<b>National Electricity Transmission System Warning - Demand Control Imminent</b>	A warning issued by <b>NGET</b> , in accordance with OC7.4.8.7, which is intended to provide short term notice, where possible, to those <b>Users</b> who are likely to receive <b>Demand</b> reduction instructions from <b>NGET</b> within 30 minutes.
<b>National Electricity Transmission System Warning - High Risk of Demand Reduction</b>	A warning issued by <b>NGET</b> , in accordance with OC7.4.8.6, which is intended to alert recipients that there is a high risk of <b>Demand</b> reduction being implemented and which may normally result from an <b>Electricity Margin Notice</b> .
<b>National Electricity Transmission System Warning - Electricity Margin Notice</b>	A warning issued by <b>NGET</b> , in accordance with OC7.4.8.5, which is intended to invite a response from and to alert recipients to a decreased <b>System Margin</b> .
<b>National Electricity Transmission System Warning - Risk of System Disturbance</b>	A warning issued by <b>NGET</b> , in accordance with OC7.4.8.8, which is intended to alert <b>Users</b> of the risk of widespread and serious <b>System</b> disturbance which may affect <b>Users</b> .
<b>Network Data</b>	The data to be provided by <b>NGET</b> to <b>Users</b> in accordance with the <b>PC</b> , as listed in Part 3 of the Appendix to the <b>PC</b> .
<b>Network Operator</b>	A person with a <b>User System</b> directly connected to the <b>National Electricity Transmission System</b> to which <b>Customers</b> and/or <b>Power Stations</b> (not forming part of the <b>User System</b> ) are connected, acting in its capacity as an operator of the <b>User System</b> , but shall not include a person acting in the capacity of an <b>Externally Interconnected System Operator</b> or a <b>Generator</b> in respect of <b>OTSUA</b> .
<del><b>New Generator</b></del>	<del>A <b>Generator</b> which is owned and/or operated by a <b>New User</b>.</del>

**Comment [NG10]:** Check with Legal this works.

<b>New-User</b>	<p>A <del>User</del> in respect of:-</p> <p>(a) <del>A Generator in respect of a Power Generating Module (including a DC Connected Power Park Module) who's Main Plant and Apparatus was connected to the System after 17 May 2018 or who had placed Purchase Contracts for its Main Plant and Apparatus after 17 May 2018 or any Type C or Type D Power Generating Module who had Substantially Modified their Plant and Apparatus after 17 May 2018.</del></p> <p>(b) <del>An HVDC System Owner or DC Converter Station owner or OTSUA (in respect of a Transmision DC Converter) who's Main Plant and Apparatus was connected to the System after 28 September 2018 or who had placed Purchase Contracts for its Main Plant and Apparatus after 28 September 2018 or who had Substantially Modified their Plant and Apparatus after 28<sup>th</sup> September 2018.</del></p> <p>(c)(i) <del>A Network Operator or Non-Embedded Customer or who's Main Plant and Apparatus was connected to the System after 7 September 2018 or who had placed Purchase Contracts for its Main Plant and Apparatus after 7 September 2018 or had substantially Substantially Modified their Plant and Apparatus after 7 September 2018.</del></p>
<b>NGET</b>	National Grid Electricity Transmission plc (NO: 2366977) whose registered office is at 1-3 Strand, London, WC2N 5EH.
<b>NGET Control Engineer</b>	The nominated person employed by NGET to direct the operation of the <b>National Electricity Transmission System</b> or such person as nominated by NGET.
<b>NGET Operational Strategy</b>	NGET's operational procedures which form the guidelines for operation of the <b>National Electricity Transmission System</b> .
<b>No-Load Field Voltage</b>	Shall have the meaning ascribed to that term in IEC 34-16-1:1991 [equivalent to <b>British Standard BS4999</b> Section 116.1 : 1992].
<b>No System Connection</b>	As defined in OC8A.1.6.2 and OC8B.1.7.2
<b>Notification of User's Intention to Synchronise</b>	A notification from a <b>Generator</b> or <b>DC Converter Station</b> owner or <b>HVDC System Owner</b> to NGET informing NGET of the date upon which any <b>OTSUA</b> , a <b>Generating Unit(s)</b> , <b>CCGT Module(s)</b> , <b>Power Park Module(s)</b> , <b>Power Generating Module(s)</b> (including a <b>DC Connected Power Park Module(s)</b> ), <b>HVDC System</b> or <b>DC Converter(s)</b> will be ready to be <b>Synchronised</b> to the <b>Total System</b> .
<b>Non-Embedded Customer</b>	A <b>Customer</b> in <b>Great Britain</b> , except for a <b>Network Operator</b> acting in its capacity as such, receiving electricity direct from the <b>Onshore Transmission System</b> irrespective of from whom it is supplied.

<b>Non-Synchronous Generating Unit</b>	An <b>Onshore Non-Synchronous Generating Unit</b> or <b>Offshore Non-Synchronous Generating Unit</b> which could form part of a <b>Power Generating Module</b> .
<b>Normal CCGT Module</b>	A <b>CCGT Module</b> other than a <b>Range CCGT Module</b> .
<b>Novel Unit</b>	A tidal, wave, wind, geothermal, or any similar, <b>Generating Unit</b> .
<b>OC9 De-synchronised Island Procedure</b>	Has the meaning set out in OC9.5.4.
<b>Offshore</b>	Means wholly or partly in <b>Offshore Waters</b> , and when used in conjunction with another term and not defined means that the associated term is to be read accordingly.
<b>Offshore DC Converter</b>	Any <b>User Apparatus</b> located <b>Offshore</b> used to convert alternating current electricity to direct current electricity, or vice versa. An <b>Offshore DC Converter</b> is a standalone operative configuration at a single site comprising one or more converter bridges, together with one or more converter transformers, converter control equipment, essential protective and switching devices and auxiliaries, if any, used for conversion.
<b>Offshore HVDC Converter</b>	Any <b>User Apparatus</b> located <b>Offshore</b> used to convert alternating current electricity to direct current electricity, or vice versa. An <b>Offshore HVDC Converter</b> is a standalone operative configuration at a single site comprising one or more converter bridges, together with one or more converter transformers, converter control equipment, essential protective and switching devices and auxiliaries, if any, used for conversion.
<b>Offshore Development Information Statement</b>	A statement prepared by <b>NGET</b> in accordance with Special Condition C4 of <b>NGET's Transmission Licence</b> .
<b>Offshore Generating Unit</b>	Unless otherwise provided in the Grid Code, any <b>Apparatus</b> located <b>Offshore</b> which produces electricity, including, an <b>Offshore Synchronous Generating Unit</b> and <b>Offshore Non-Synchronous Generating Unit</b> which could also be part of a <b>Power Generating Module</b> .

<b>Offshore Grid Entry Point</b>	<p>In the case of:-</p> <p>(a) an <b>Offshore Generating Unit</b> or an <b>Offshore Synchronous Power Generating Module</b> or an <b>Offshore DC Converter</b> or an <b>Offshore HVDC Converter</b>, as the case may be, which is directly connected to an <b>Offshore Transmission System</b>, the point at which it connects to that <b>Offshore Transmission System</b>, or;</p> <p>(b) an <b>Offshore Power Park Module</b> which is directly connected to an <b>Offshore Transmission System</b>, the point where one <b>Power Park String</b> (registered by itself as a <b>Power Park Module</b>) or the collection of points where a number of <b>Offshore Power Park Strings</b> (registered as a single <b>Power Park Module</b>) connects to that <b>Offshore Transmission System</b>, or;</p> <p>(c) an <b>External Interconnection</b> which is directly connected to an <b>Offshore Transmission System</b>, the point at which it connects to that <b>Offshore Transmission System</b>.</p>
<b>Offshore Non-Synchronous Generating Unit</b>	An <b>Offshore Generating Unit</b> that is not an <b>Offshore Synchronous Generating Unit</b> including for the avoidance of doubt a <b>Power Park Unit</b> located <b>Offshore</b> .
<b>Offshore Platform</b>	A single structure comprising of <b>Plant</b> and <b>Apparatus</b> located <b>Offshore</b> which includes one or more <b>Offshore Grid Entry Points</b> .
<b>Offshore Power Park Module</b>	<p>A collection of one or more <b>Offshore Power Park Strings</b> (registered as a <b>Power Park Module</b> under the <b>PC</b>). There is no limit to the number of <b>Power Park Strings</b> within the <b>Power Park Module</b>, so long as they either:</p> <p>(a) connect to the same busbar which cannot be electrically split; or</p> <p>(b) connect to a collection of directly electrically connected busbars of the same nominal voltage and are configured in accordance with the operating arrangements set out in the relevant <b>Bilateral Agreement</b>.</p>
<b>Offshore Power Park String</b>	A collection of <b>Offshore Generating Units</b> or <b>Power Park Units</b> that are powered by an <b>Intermittent Power Source</b> , joined together by cables forming part of a <b>User System</b> with a single point of connection to an <b>Offshore Transmission System</b> . The connection to an <b>Offshore Transmission System</b> may include a <b>DC Converter</b> or <b>HVDC Converter</b> .
<b>Offshore Synchronous Generating Unit</b>	An <b>Offshore Generating Unit</b> which could be part of an <b>Offshore Synchronous Power Generating Module</b> in which, under all steady state conditions, the rotor rotates at a mechanical speed equal to the electrical frequency of the <b>National Electricity Transmission System</b> divided by the number of pole pairs of the <b>Generating Unit</b> .
<b>Offshore Synchronous Power Generating Module</b>	A <b>Synchronous Power Generating Module</b> located <b>Offshore</b> .

<b>Offshore Tender Process</b>	The process followed by the <b>Authority</b> to make, in prescribed cases, a determination on a competitive basis of the person to whom an offshore transmission licence is to be granted.
<b>Offshore Transmission Distribution Connection Agreement</b>	An agreement entered into by <b>NGET</b> and a <b>Network Operator</b> in respect of the connection to and use of a <b>Network Operator's User System</b> by an <b>Offshore Transmission System</b> .
<b>Offshore Transmission Licensee</b>	Such person in relation to whose <b>Transmission Licence</b> the standard conditions in Section E (offshore transmission owner standard conditions) of such <b>Transmission Licence</b> have been given effect, or any person in that prospective role who has acceded to the <b>STC</b> .
<b>Offshore Transmission System</b>	A system consisting (wholly or mainly) of high voltage electric lines and used for the transmission of electricity from one <b>Power Station</b> to a sub-station or to another <b>Power Station</b> or between sub-stations, and includes any <b>Plant</b> and <b>Apparatus</b> (including <b>OTSUA</b> ) and meters in connection with the transmission of electricity but does not include any <b>Remote Transmission Assets</b> . An <b>Offshore Transmission System</b> extends from the <b>Interface Point</b> , or the <b>Offshore Grid Entry Point(s)</b> and may include <b>Plant</b> and <b>Apparatus</b> located <b>Onshore</b> and <b>Offshore</b> and, where the context permits, references to the <b>Offshore Transmission System</b> includes <b>OTSUA</b> .
<b>Offshore Transmission System Development User Works or OTSDUW</b>	In relation to a particular <b>User</b> where the <b>OTSDUW Arrangements</b> apply, means those activities and/or works for the design, planning, consenting and/or construction and installation of the <b>Offshore Transmission System</b> to be undertaken by the <b>User</b> as identified in Part 2 of Appendix I of the relevant <b>Construction Agreement</b> .
<b>Offshore Transmission System User Assets or OTSUA</b>	<b>OTSDUW Plant and Apparatus</b> constructed and/or installed by a <b>User</b> under the <b>OTSDUW Arrangements</b> which form an <b>Offshore Transmission System</b> that once transferred to a <b>Relevant Transmission Licensee</b> under an <b>Offshore Tender Process</b> will become part of the <b>National Electricity Transmission System</b> .
<b>Offshore Waters</b>	Has the meaning given to "offshore waters" in Section 90(9) of the Energy Act 2004.
<b>Offshore Works Assumptions</b>	In relation to a particular <b>User</b> means those assumptions set out in Appendix P of the relevant <b>Construction Agreement</b> as amended from time to time.
<b>Onshore</b>	Means within <b>Great Britain</b> , and when used in conjunction with another term and not defined means that the associated term is to be read accordingly.

**Comment [NG11]:** Moved into alphabetical order - house keeping change

**Comment [NG12]:** House Keeping change - moved into alphabetical order

<b>Onshore DC Converter</b>	Any <b>User Apparatus</b> located <b>Onshore</b> with a <b>Completion Date</b> after 1 <sup>st</sup> April 2005 used to convert alternating current electricity to direct current electricity, or vice versa. An <b>Onshore DC Converter</b> is a standalone operative configuration at a single site comprising one or more converter bridges, together with one or more converter transformers, converter control equipment, essential protective and switching devices and auxiliaries, if any, used for conversion. In a bipolar arrangement, an <b>Onshore DC Converter</b> represents the bipolar configuration.
<b>Onshore Generating Unit</b>	Unless otherwise provided in the Grid Code, any <b>Apparatus</b> located <b>Onshore</b> which produces electricity, including, an <b>Onshore Synchronous Generating Unit</b> and <b>Onshore Non-Synchronous Generating Unit</b> which could also be part of a <b>Power Generating Module</b> .
<b>Onshore Grid Entry Point</b>	A point at which a <b>Onshore Generating Unit</b> or a <b>CCGT Module</b> or a <b>CCGT Unit</b> or an <b>Onshore Power Generating Module</b> or a <b>Onshore DC Converter</b> or an <b>Onshore HVDC Converter</b> or a <b>Onshore Power Park Module</b> or an <b>External Interconnection</b> , as the case may be, which is directly connected to the <b>Onshore Transmission System</b> connects to the <b>Onshore Transmission System</b> .
<b>Onshore HVDC Converter</b>	Any <b>User Apparatus</b> located <b>Onshore</b> used to convert alternating current electricity to direct current electricity, or vice versa. An <b>Onshore HVDC Converter</b> is a standalone operative configuration at a single site comprising one or more converter bridges, together with one or more converter transformers, converter control equipment, essential protective and switching devices and auxiliaries, if any, used for conversion. In a bipolar arrangement, an <b>Onshore HVDC Converter</b> represents the bipolar configuration.
<b>Onshore Non-Synchronous Generating Unit</b>	A <b>Generating Unit</b> located <b>Onshore</b> that is not a <b>Synchronous Generating Unit</b> including for the avoidance of doubt a <b>Power Park Unit</b> located <b>Onshore</b> .
<b>Onshore Power Park Module</b>	A collection of <b>Non-Synchronous Generating Units</b> (registered as a <b>Power Park Module</b> under the <b>PC</b> ) that are powered by an <b>Intermittent Power Source</b> or connected through power electronic conversion technology, joined together by a <b>System</b> with a single electrical point of connection directly to the <b>Onshore Transmission System</b> (or <b>User System</b> if <b>Embedded</b> ) with no intermediate <b>Offshore Transmission System</b> connections. The connection to the <b>Onshore Transmission System</b> (or <b>User System</b> if <b>Embedded</b> ) may include a <b>DC Converter</b> or <b>HVDC Converter</b> .

<b>Onshore Synchronous Generating Unit</b>	An <b>Onshore Generating Unit</b> (which could also be part of an <b>Onshore Power Generating Module</b> ) including, for the avoidance of doubt, a <b>CCGT Unit</b> in which, under all steady state conditions, the rotor rotates at a mechanical speed equal to the electrical frequency of the <b>National Electricity Transmission System</b> divided by the number of pole pairs of the <b>Generating Unit</b> .
<b>Onshore Synchronous Power Generating Module</b>	A <b>Synchronous Power Generating Module</b> located <b>Onshore</b> .
<b>Onshore Transmission Licensee</b>	<b>NGET, SPT, or SHETL</b> .
<b>Onshore Transmission System</b>	The system consisting (wholly or mainly) of high voltage electric lines owned or operated by <b>Onshore Transmission Licensees</b> and used for the transmission of electricity from one <b>Power Station</b> to a substation or to another <b>Power Station</b> or between substations or to or from <b>Offshore Transmission Systems</b> or to or from any <b>External Interconnection</b> , and includes any <b>Plant</b> and <b>Apparatus</b> and meters owned or operated by any <b>Onshore Transmission Licensee</b> in connection with the transmission of electricity but does not include any <b>Remote Transmission Assets</b> .
<b>On-Site Generator Site</b>	A site which is determined by the <b>BSC Panel</b> to be a Trading Unit under the <b>BSC</b> by reason of having fulfilled the Class 1 or Class 2 requirements as such terms are used in the <b>BSC</b> .
<b>Operating Code or OC</b>	That portion of the Grid Code which is identified as the <b>Operating Code</b> .
<b>Operating Margin</b>	<b>Contingency Reserve</b> plus <b>Operating Reserve</b> .
<b>Operating Reserve</b>	The additional output from <b>Large Power Stations</b> or the reduction in <b>Demand</b> , which must be realisable in real-time operation to respond in order to contribute to containing and correcting any <b>System Frequency</b> fall to an acceptable level in the event of a loss of generation or a loss of import from an <b>External Interconnection</b> or mismatch between generation and <b>Demand</b> .
<b>Operation</b>	A scheduled or planned action relating to the operation of a <b>System</b> (including an <b>Embedded Power Station</b> ).
<b>Operational Data</b>	Data required under the <b>Operating Codes</b> and/or <b>Balancing Codes</b> .
<b>Operational Day</b>	The period from 0500 hours on one day to 0500 on the following day.
<b>Operation Diagrams</b>	Diagrams which are a schematic representation of the <b>HV Apparatus</b> and the connections to all external circuits at a <b>Connection Site</b> (and in the case of <b>OTSDUW, Transmission Interface Site</b> ), incorporating its numbering, nomenclature and labelling.

<b>Operational Effect</b>	Any effect on the operation of the relevant other <b>System</b> which causes the <b>National Electricity Transmission System</b> or the <b>System</b> of the other <b>User</b> or <b>Users</b> , 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.
<b>Operational Intertripping</b>	The automatic tripping of circuit-breakers to prevent abnormal system conditions occurring, such as over voltage, overload, <b>System</b> instability, etc. after the tripping of other circuit-breakers following power <b>System</b> fault(s) which includes <b>System</b> to <b>Generating Unit</b> , <b>System</b> to <b>CCGT Module</b> , <b>System</b> to <b>Power Park Module</b> , <b>System</b> to <b>DC Converter</b> , <b>System</b> to <b>Power Generating Module</b> , <b>System</b> to <b>HVDC Converter</b> and <b>System</b> to <b>Demand</b> intertripping schemes.
<b>Operational Notifications</b>	Any <b>Energisation Operational Notification</b> , <b>Preliminary Operational Notification</b> , <b>Interim Operational Notification</b> , <b>Final Operational Notification</b> or <b>Limited Operational Notification</b> issued from <b>NGET</b> to a <b>User</b> .
<b>Operational Planning</b>	Planning through various timescales the matching of generation output with forecast <b>National Electricity Transmission System Demand</b> together with a reserve of generation to provide a margin, taking into account outages of certain <b>Generating Units</b> or <b>Power Generating Modules</b> , of parts of the <b>National Electricity Transmission System</b> and of parts of <b>User Systems</b> to which <b>Power Stations</b> and/or <b>Customers</b> are connected, carried out to achieve, so far as possible, the standards of security set out in <b>NGET's Transmission Licence</b> , each <b>Relevant Transmission Licensee's Transmission Licence</b> or <b>Electricity Distribution Licence</b> , as the case may be.
<b>Operational Planning Margin</b>	An operational planning margin set by <b>NGET</b> .
<b>Operational Planning Phase</b>	The period from 8 weeks to the end of the 5 <sup>th</sup> year ahead of real time operation.
<b>Operational Procedures</b>	Management instructions and procedures, both in support of the <b>Safety Rules</b> and for the local and remote operation of <b>Plant</b> and <b>Apparatus</b> , issued in connection with the actual operation of <b>Plant</b> and/or <b>Apparatus</b> at or from a <b>Connection Site</b> .
<b>Operational Switching</b>	Operation of <b>Plant</b> and/or <b>Apparatus</b> to the instruction of the relevant <b>Control Engineer</b> . For the avoidance of doubt, the operation of <b>Transmission Plant</b> and/or <b>Apparatus</b> forming part of the <b>National Electricity Transmission System</b> in England and Wales, will be to the instruction of <b>NGET</b> and in Scotland and <b>Offshore</b> will be to the instruction of the <b>Relevant Transmission Licensee</b> .
<b>Other Relevant Data</b>	The data listed in BC1.4.2(f) under the heading <b>Other Relevant Data</b> .

<del>Offshore Transmission System Development User Works or OTSDUW</del>	<del>In relation to a particular User where the OTSDUW Arrangements apply, means those activities and/or works for the design, planning, consenting and/or construction and installation of the Offshore Transmission System to be undertaken by the User as identified in Part 2 of Appendix I of the relevant Construction Agreement.</del>
OTSDUW Arrangements	The arrangements whereby certain aspects of the design, consenting, construction, installation and/or commissioning of transmission assets are capable of being undertaken by a User prior to the transfer of those assets to a Relevant Transmission Licensee under an Offshore Tender Process.
OTSDUW Data and Information	The data and information to be provided by Users undertaking OTSDUW, to NGET in accordance with Appendix F of the Planning Code.
OTSDUW DC Converter	A Transmission DC Converter designed and/or constructed and/or installed by a User under the OTSDUW Arrangements and/or operated by the User until the OTSUA Transfer Time.
OTSDUW Development and Data Timetable	The timetable for both the delivery of OTSDUW Data and Information and OTSDUW Network Data and Information as referred to in Appendix F of the Planning Code and the development of the scope of the OTSDUW.
OTSDUW Network Data and Information	The data and information to be provided by NGET to Users undertaking OTSDUW in accordance with Appendix F of the Planning Code.
OTSDUW Plant and Apparatus	Plant and Apparatus, including any OTSDUW DC Converter, designed by the User under the OTSDUW Arrangements.
<del>Offshore Transmission System User Assets or OTSUA</del>	<del>OTSDUW Plant and Apparatus constructed and/or installed by a User under the OTSDUW Arrangements which form an Offshore Transmission System that once transferred to a Relevant Transmission Licensee under an Offshore Tender Process will become part of the National Electricity Transmission System.</del>
OTSUA Transfer Time	The time and date at which the OTSUA are transferred to a Relevant Transmission Licensee.
Out of Synchronism	The condition where a System or Generating Unit or Power Generating Module cannot meet the requirements to enable it to be Synchronised.

<b>Output Usable or OU</b>	<p>The (daily or weekly) forecast value (in MW), at the time of the (daily or weekly) peak demand, of the maximum level at which the <b>Genset</b> can export to the <b>Grid Entry Point</b>, or in the case of <b>Embedded Power Stations</b>, to the <b>User System Entry Point</b>. In addition, for a <b>Genset</b> powered by an <b>Intermittent Power Source</b> the forecast value is based upon the <b>Intermittent Power Source</b> being at a level which would enable the <b>Genset</b> to generate at <b>Registered Capacity</b>.</p> <p>For the purpose of OC2 only, the term <b>Output Usable</b> shall include the terms <b>Interconnector Export Capacity</b> and <b>Interconnector Import Capacity</b> where the term <b>Output Usable</b> is being applied to an <b>External Interconnection</b>.</p>
<b>Over-excitation Limiter</b>	Shall have the meaning ascribed to that term in IEC 34-16-1:1991 [equivalent to <b>British Standard BS4999</b> Section 116.1 : 1992].
<b>Panel Chairman</b>	A person appointed as such in accordance with GR.4.1.
<b>Panel Member</b>	Any of the persons identified as such in GR.4.
<b>Panel Members' Recommendation</b>	The recommendation in accordance with the " <b>Grid Code Review Panel Recommendation Vote</b> "
<b>Panel Secretary</b>	A person appointed as such in accordance with GR.3.1.2(d).
<b>Part 1 System Ancillary Services</b>	<b>Ancillary Services</b> which are required for <b>System</b> reasons and which must be provided by <b>Users</b> in accordance with the <b>Connection Conditions</b> . An exhaustive list of <b>Part 1 System Ancillary Services</b> is included in that part of CC.8.1 headed Part 1.
<b>Part 2 System Ancillary Services</b>	<b>Ancillary Services</b> which are required for <b>System</b> reasons and which must be provided by a <b>User</b> if the <b>User</b> has agreed to provide them under a <b>Bilateral Agreement</b> . A non-exhaustive list of <b>Part 2 System Ancillary Services</b> is included in that part of CC.8.1 headed Part 2.
<b>Part Load</b>	The condition of a <b>Genset</b> , or <b>Cascade Hydro Scheme</b> which is <b>Loaded</b> but is not running at its Maximum Export Limit.

<p><b>Permit for Work for proximity work</b></p>	<p>In respect of <b>E&amp;W Transmission Systems</b>, a document issued by the <b>Relevant E&amp;W Transmission Licensee</b> or an <b>E&amp;W User</b> in accordance with its respective <b>Safety Rules</b> to enable work to be carried out in accordance with OC8A.8 and which provides for <b>Safety Precautions</b> to be applied and maintained. An example format of a <b>Relevant E&amp;W Transmission Licensee's</b> permit for work is attached as Appendix E to <b>OC8A</b>.</p> <p>In respect of <b>Scottish Transmission Systems</b>, a document issued by a <b>Relevant Scottish Transmission Licensee</b> or a <b>Scottish User</b> in accordance with its respective <b>Safety Rules</b> to enable work to be carried out in accordance with OC8B.8 and which provides for <b>Safety Precautions</b> to be applied and maintained. Example formats of <b>Relevant Scottish Transmission Licensees'</b> permits for work are attached as Appendix E to <b>OC8B</b>.</p>
<p><b>Partial Shutdown</b></p>	<p>The same as a <b>Total Shutdown</b> except that all generation has ceased in a separate part of the <b>Total System</b> and there is no electricity supply from <b>External Interconnections</b> or other parts of the <b>Total System</b> to that part of the <b>Total System</b> and, therefore, that part of the <b>Total System</b> is shutdown, with the result that it is not possible for that part of the <b>Total System</b> to begin to function again without <b>NGET's</b> directions relating to a <b>Black Start</b>.</p>
<p><b>Pending Grid Code Modification Proposal</b></p>	<p>A <b>Grid Code Modification Proposal</b> in respect of which, at the relevant time, the <b>Authority</b> has not yet made a decision as to whether to direct such <b>Grid Code Modification Proposal</b> to be made pursuant to the <b>Transmission Licence</b> (whether or not a <b>Grid Code Modification Report</b> has been submitted in respect of such <b>Grid Code Modification Proposal</b>) or, in the case of a <b>Grid Code Self Governance Proposals</b>, in respect of which the <b>Grid Code Review Panel</b> has not yet voted whether or not to approve.</p>
<p><b>Phase (Voltage) Unbalance</b></p>	<p>The ratio (in percent) between the rms values of the negative sequence component and the positive sequence component of the voltage.</p>
<p><b>Physical Notification</b></p>	<p>Data that describes the <b>BM Participant's</b> best estimate of the expected input or output of <b>Active Power</b> of a <b>BM Unit</b> and/or (where relevant) <b>Generating Unit</b>, the accuracy of the <b>Physical Notification</b> being commensurate with <b>Good Industry Practice</b>.</p>
<p><b>Planning Code or PC</b></p>	<p>That portion of the Grid Code which is identified as the <b>Planning Code</b>.</p>

<b>Planned Maintenance Outage</b>	An outage of <b>NGET</b> electronic data communication facilities as provided for in CC.6.5.8 and <b>NGET's</b> associated computer facilities of which normally at least 5 days notice is given, but in any event of which at least twelve hours notice has been given by <b>NGET</b> to the <b>User</b> 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 <b>NGET</b> to the <b>User</b> . It is anticipated that normally any planned outage would only last around one hour.
<b>Planned Outage</b>	An outage of a <b>Large Power Station</b> or of part of the <b>National Electricity Transmission System</b> , or of part of a <b>User System</b> , co-ordinated by <b>NGET</b> under <b>OC2</b> .
<b>Plant</b>	Fixed and movable items used in the generation and/or supply and/or transmission of electricity, other than <b>Apparatus</b> .
<b>Point of Common Coupling</b>	That point on the <b>National Electricity Transmission System</b> electrically nearest to the <b>User</b> installation at which either <b>Demands</b> or <b>Loads</b> are, or may be, connected.
<b>Point of Connection</b>	An electrical point of connection between the <b>National Electricity Transmission System</b> and a <b>User's System</b> .
<b>Point of Isolation</b>	The point on <b>Apparatus</b> (as defined in OC8A.1.6.2 and OC8B.1.7.2) at which <b>Isolation</b> is achieved.
<b>Post-Control Phase</b>	The period following real time operation.
<b>Power Available</b>	A signal prepared in accordance with good industry practice, representing the instantaneous sum of the potential <b>Active Power</b> available from each individual <b>Power Park Unit</b> within the <b>Power Park Module</b> calculated using any applicable combination of meteorological (including wind speed), electrical or mechanical data measured at each <b>Power Park Unit</b> at a specified time. <b>Power Available</b> shall be a value between 0MW and <b>Registered Capacity</b> or <b>Maximum Capacity</b> which is the sum of the potential <b>Active Power</b> available of each <b>Power Park Unit</b> within the <b>Power Park Module</b> . A turbine that is not generating will be considered as not available. For the avoidance of doubt, the <b>Power Available</b> signal would be the <b>Active Power</b> output that a <b>Power Park Module</b> could reasonably be expected to export at the <b>Grid Entry Point</b> or <b>User System Entry Point</b> taking all the above criteria into account including <b>Power Park Unit</b> constraints such as optimisation modes but would exclude a reduction in the <b>Active Power</b> export of the <b>Power Park Module</b> instructed by <b>NGET</b> (for example) for the purposes selecting a <b>Power Park Module</b> to operate in <b>Frequency Sensitive Mode</b> or when an <b>Emergency Instruction</b> has been issued.
<b>Power Factor</b>	The ratio of <b>Active Power</b> to <b>Apparent Power</b> .
<b>Power-Generating Module</b>	Either a <b>Synchronous Power-Generating Module</b> or a <b>Power Park Module</b> owned or operated by an <b>EUNew Generator</b> .

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<b>Power-Generating Module Document (PGMD)</b>	A document provided by the <b>Generator</b> to <b>NGET</b> for a <b>Type B</b> or <b>Type C Power Generating Module</b> which confirms that the <b>Power Generating Module's</b> compliance with the technical criteria set out in the Grid Code has been demonstrated and provides the necessary data and statements, including a statement of compliance.
<b>Power Generating Module Performance Chart</b>	<u>A diagram showing the <b>Real Power (MW)</b> and <b>Reactive Power (MVAR)</b> capability limits within which a <b>Synchronous Power Generating Module</b> or <b>Power Park Module</b> at its <b>Grid Entry Point</b> or <b>User System Entry Point</b> will be expected to operate under steady state conditions.</u>
<b>Power Island</b>	<b>Generators</b> at an isolated <b>Power Station</b> , together with complementary local <b>Demand</b> . In Scotland a <b>Power Island</b> may include more than one <b>Power Station</b> .
<b>Power Park Module</b>	Any <b>Onshore Power Park Module</b> or <b>Offshore Power Park Module</b> .
<b>Power Park Module Availability Matrix</b>	The matrix described in Appendix 1 to BC1 under the heading <b>Power Park Module Availability Matrix</b> .
<b>Power Park Module Planning Matrix</b>	A matrix in the form set out in Appendix 4 of OC2 showing the combination of <b>Power Park Units</b> within a <b>Power Park Module</b> which would be expected to be running under normal conditions.
<b>Power Park Unit</b>	A <b>Generating Unit</b> within a <b>Power Park Module</b> .
<b>Power Station</b>	An installation comprising one or more <b>Generating Units</b> or <b>Power Park Modules</b> or <b>Power Generating Modules</b> (even where sited separately) owned and/or controlled by the same <b>Generator</b> , which may reasonably be considered as being managed as one <b>Power Station</b> .
<b>Power System Stabiliser or PSS</b>	Equipment controlling the <b>Exciter</b> 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).
<b>Preface</b>	The preface to the Grid Code (which does not form part of the Grid Code and therefore is not binding).
<b>Preliminary Notice</b>	A notice in writing, sent by <b>NGET</b> both to all <b>Users</b> identified by it under OC12.4.2.1 and to the <b>Test Proposer</b> , notifying them of a proposed <b>System Test</b> .
<b>Preliminary Project Planning Data</b>	Data relating to a proposed <b>User Development</b> at the time the <b>User</b> applies for a <b>CUSC Contract</b> but before an offer is made and accepted.

<b>Preliminary Operational Notification or PON</b>	<p>A notification from <b>NGET</b> to a <b>Generator</b> in respect of a <b>Power Station</b> comprising <b>Type B</b> or <b>Type C Power Generating Modules</b> acknowledging that the <b>User</b> has demonstrated compliance, except for the <b>Unresolved Issues</b>;</p> <p>(a) with the Grid Code, and</p> <p>(b) where applicable, with Appendices F1 to F5 of the <b>Bilateral Agreement</b>,</p>
<b>Primary Response</b>	<p>The automatic increase in <b>Active Power</b> output of a <b>Genset</b> or, as the case may be, the decrease in <b>Active Power Demand</b> in response to a <b>System Frequency</b> fall. This increase in <b>Active Power</b> output or, as the case may be, the decrease in <b>Active Power Demand</b> must be in accordance with the provisions of the relevant <b>Ancillary Services Agreement</b> 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 <b>Frequency</b> fall on the basis set out in the <b>Ancillary Services Agreement</b> and fully available by the latter, and sustainable for at least a further 20 seconds. The interpretation of the <b>Primary Response</b> to a – 0.5 Hz frequency change is shown diagrammatically in Figure CC.A.3.2 and Figure ECC.A.3.2</p>
<b>Private Network</b>	<p>A <b>User</b> which connects to a <b>Network Operators System</b> and that <b>User</b> is not classified as a <b>Generator</b>, <b>Network Operator</b> or <b>Non Embedded Customer</b>.</p>
<b>Programming Phase</b>	<p>The period between the <b>Operational Planning Phase</b> and the <b>Control Phase</b>. It starts at the 8 weeks ahead stage and finishes at 17:00 on the day ahead of real time.</p>
<b>Proposal Notice</b>	<p>A notice submitted to <b>NGET</b> by a <b>User</b> which would like to undertake a <b>System Test</b>.</p>
<b>Proposal Report</b>	<p>A report submitted by the <b>Test Panel</b> which contains:</p> <p>(a) proposals for carrying out a <b>System Test</b> (including the manner in which the <b>System Test</b> is to be monitored);</p> <p>(b) an allocation of costs (including un-anticipated costs) between the affected parties (the general principle being that the <b>Test Proposer</b> will bear the costs); and</p> <p>(c) such other matters as the <b>Test Panel</b> considers appropriate.</p> <p>The report may include requirements for indemnities to be given in respect of claims and losses arising from a <b>System Test</b>.</p>
<b>Proposed Implementation Date</b>	<p>The proposed date(s) for the implementation of a <b>Grid Code Modification Proposal</b> or <b>Workgroup Alternative Grid Code Modification</b> such date(s) to be either (i) described by reference to a specified period after a direction from the Authority approving the <b>Grid Code Modification Proposal</b> or <b>Workgroup Alternative Grid Code Modification</b> or (ii) a <b>Fixed Proposed Implementation Date</b>.</p>

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<b>Protection</b>	The provisions for detecting abnormal conditions on a <b>System</b> and initiating fault clearance or actuating signals or indications.
<b>Protection Apparatus</b>	A group of one or more <b>Protection</b> relays and/or logic elements designated to perform a specified <b>Protection</b> function.
<b>Pump Storage</b>	A a hydro unit in which water can be raised by means of pumps and stored to be used for the generation of electrical energy;
<b>Pumped Storage Generator</b>	A <b>Generator</b> which owns and/or operates any <b>Pumped Storage Plant</b> .
<b>Pumped Storage Plant</b>	The Dinorwig, Ffestiniog, Cruachan and Foyers <b>Power Stations</b> .
<b>Pumped Storage Unit</b>	A <b>Generating Unit</b> within a <b>Pumped Storage Plant</b> .
<b>Purchase Contracts</b>	A final and binding contract for the purchase of the <b>Main Plant and Apparatus</b> .
<b>Q/Pmax</b>	<p>The ratio of <b>Reactive Power</b> to the <b>Maximum Capacity</b>. The relationship between <b>Power Factor</b> and <b>Q/Pmax</b> is given by the formula:-</p> $\text{Power Factor} = \text{Cos} \left[ \arctan \left[ \frac{Q}{P_{max}} \right] \right]$ <p>For example, a <b>Power Park Module</b> with a Q/P value of +0.33 would equate to a <b>Power Factor</b> of <math>\text{Cos}(\arctan 0.33) = 0.95</math> <b>Power Factor</b> lag.</p>
<b>Quiescent Physical Notification or QPN</b>	Data that describes the MW levels to be deducted from the <b>Physical Notification</b> of a <b>BM Unit</b> to determine a resultant operating level to which the <b>Dynamic Parameters</b> associated with that <b>BM Unit</b> apply, and the associated times for such MW levels. The MW level of the <b>QPN</b> must always be set to zero.
<b>Range CCGT Module</b>	A <b>CCGT Module</b> where there is a physical connection by way of a steam or hot gas main between that <b>CCGT Module</b> and another <b>CCGT Module</b> or other <b>CCGT Modules</b> , which connection contributes (if open) to efficient modular operation, and which physical connection can be varied by the operator.
<b>Rated Field Voltage</b>	Shall have the meaning ascribed to that term in <b>IEC 34-16-1:1991</b> [equivalent to <b>British Standard BS4999 Section 116.1 : 1992</b> ].

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<b>Rated MW</b>	<p>The “rating-plate” MW output of a <b>Power Generating Module, Generating Unit, Power Park Module, HVDC Converter or DC Converter</b>, being:</p> <p>(a) that output up to which the <b>Generating Unit</b> was designed to operate (Calculated as specified in <b>British Standard BS EN 60034 – 1: 1995</b>); or</p> <p>(b) the nominal rating for the MW output of a <b>Power Park Module</b> or <b>Power Generating Module</b> being the maximum continuous electric output power which the <b>Power Park Module</b> or <b>Power Generating Module</b> was designed to achieve under normal operating conditions; or</p> <p>(c) the nominal rating for the MW import capacity and export capacity (if at a <b>DC Converter Station</b> or <b>HVDC Converter Station</b>) of a <b>DC Converter</b> or <b>HVDC Converter</b>.</p>
<b>Reactive Despatch Instruction</b>	Has the meaning set out in the <b>CUSC</b> .
<b>Reactive Despatch Network Restriction</b>	A restriction placed upon an <b>Embedded Power Generating Module, Embedded Generating Unit, Embedded Power Park Module or DC Converter</b> at an <b>Embedded DC Converter Station</b> or <b>HVDC Converter</b> at an <b>Embedded HVDC Converter Station</b> by the <b>Network Operator</b> that prevents the <b>Generator or DC Converter Station owner or HVDC System Owner</b> in question (as applicable) from complying with any <b>Reactive Despatch Instruction</b> with respect to that <b>Power Generating Module, Generating Unit, Power Park Module or DC Converter</b> at a <b>DC Converter Station</b> or <b>HVDC Converter</b> at a <b>HVDC Converter Station</b> , whether to provide Mvars over the range referred to in CC 6.3.2, ECC.6.3.2 or otherwise.
<b>Reactive Energy</b>	The integral with respect to time of the <b>Reactive Power</b> .
<b>Reactive Power</b>	<p>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:</p> <p>1000 VAR = 1 kVAR</p> <p>1000 kVAR = 1 Mvar</p>
<b>Record of Inter-System Safety Precautions or RISSP</b>	A written record of inter-system <b>Safety Precautions</b> to be compiled in accordance with the provisions of <b>OC8</b> .

<p><b>Registered Capacity</b></p>	<p>(a) In the case of a <b>Generating Unit</b> other than that forming part of a <b>CCGT Module</b> or <b>Power Park Module</b> or <b>Power Generating Module</b>, the normal full load capacity of a <b>Generating Unit</b> as declared by the <b>Generator</b>, less the MW consumed by the <b>Generating Unit</b> through the <b>Generating Unit's Unit Transformer</b> when producing the same (the resultant figure being expressed in whole MW, or in MW to one decimal place).</p> <p>(b) In the case of a <del>Power Generating Module</del> or <b>CCGT Module</b> or <b>Power Park Module</b> owned or operated by a <b>GB Generator</b>, the normal full load capacity of the <del>Power Generating Module</del> or <b>CCGT Module</b> or <b>Power Park Module</b> (as the case may be) as declared by the <b>GB Generator</b>, being the <b>Active Power</b> declared by the <b>GB Generator</b> as being deliverable by the <del>Power Generating Module</del>, <b>CCGT Module</b> or <b>Power Park Module</b> at the <b>Grid Entry Point</b> (or in the case of an <b>Embedded Power Generating Module</b>, <b>CCGT Module</b> or <b>Power Park Module</b>, at the <b>User System Entry Point</b>), expressed in whole MW, or in MW to one decimal place. <u>For the avoidance of doubt <b>Maximum Capacity</b> would apply to <b>Power Generating Modules</b> which form part of a <b>Large, Medium</b> or <b>Small Power Stations</b>.</u></p> <p>(c) In the case of a <b>Power Station</b>, the maximum amount of <b>Active Power</b> deliverable by the <b>Power Station</b> at the <b>Grid Entry Point</b> (or in the case of an <b>Embedded Power Station</b> at the <b>User System Entry Point</b>), as declared by the <b>Generator</b>, expressed in whole <u>MW</u>, or in MW to one decimal place. The maximum <b>Active Power</b> deliverable is the maximum amount deliverable simultaneously by the <b>Power Generating Modules</b> and/or <b>Generating Units</b> and/or <b>CCGT Modules</b> and/or <b>Power Park Modules</b> less the <u>MW</u> consumed by the <b>Power Generating Modules</b> and/or <b>Generating Units</b> and/or <b>CCGT Modules</b> in producing that <b>Active Power</b> <u>and forming part of a <b>Power Station</b>.</u></p> <p>(d) In the case of a <b>DC Converter</b> at a <b>DC Converter Station</b> or <b>HVDC Converter</b> at an <b>HVDC Converter Station</b>, the normal full load amount of <b>Active Power</b> transferable from a <b>DC Converter</b> or <b>HVDC Converter</b> at the <b>Onshore Grid Entry Point</b> (or in the case of an <b>Embedded DC Converter Station</b> or an <b>Embedded HVDC Converter Station</b> at the <b>User System Entry Point</b>), as declared by the <b>DC Converter Station</b> owner or <b>HVDC System Owner</b>, expressed in whole MW, or in MW to one decimal place.</p> <p>(e) In the case of a <b>DC Converter Station</b> or <b>HVDC Converter Station</b>, the maximum amount of <u>Active Power</u> transferable from a <b>DC Converter Station</b> or <b>HVDC Converter Station</b> at the <b>Onshore Grid Entry Point</b> (or in the case of an <b>Embedded DC Converter Station</b> or <b>Embedded HVDC Converter Station</b> at the <b>User System Entry Point</b>), as declared by the <b>DC Converter Station</b> owner or <b>HVDC System Owner</b>, expressed in whole MW, or in MW to one decimal place.</p>
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<b>Registered Data</b>	Those items of <b>Standard Planning Data</b> and <b>Detailed Planning Data</b> which upon connection become fixed (subject to any subsequent changes).
<b>Registered Import Capability</b>	<p>In the case of a <b>DC Converter Station</b> or <b>HVDC Converter Station</b> containing <b>DC Converters</b> or <b>HVDC Converters</b> connected to an <b>External System</b>, the maximum amount of <b>Active Power</b> transferable into a <b>DC Converter Station</b> or <b>HVDC Converter Station</b> at the <b>Onshore Grid Entry Point</b> (or in the case of an <b>Embedded DC Converter Station</b> or <b>Embedded HVDC Converter Station</b> at the <b>User System Entry Point</b>), as declared by the <b>DC Converter Station</b> owner or <b>HVDC System Owner</b>, expressed in whole MW.</p> <p>In the case of a <b>DC Converter</b> or <b>HVDC Converter</b> connected to an <b>External System</b> and in a <b>DC Converter Station</b> or <b>HVDC Converter Station</b>, the normal full load amount of <b>Active Power</b> transferable into a <b>DC Converter</b> or <b>HVDC Converter</b> at the <b>Onshore Grid Entry Point</b> (or in the case of an <b>Embedded DC Converter Station</b> or <b>Embedded HVDC Converter Station</b> at the <b>User System Entry Point</b>), as declared by the <b>DC Converter</b> owner or <b>HVDC System Owner</b>, expressed in whole MW.</p>
<b>Regulations</b>	The Utilities Contracts Regulations 1996, as amended from time to time.
<b>Reheater Time Constant</b>	Determined at <b>Registered Capacity</b> , 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.
<b>Rejected Grid Code Modification Proposal</b>	A <b>Grid Code Modification Proposal</b> in respect of which the <b>Authority</b> has decided not to direct <b>The Company</b> to modify the <b>Grid Code</b> pursuant to the <b>Transmission Licence</b> in the manner set out herein or, in the case of a <b>Grid Code Self Governance Proposals</b> , in respect of which the <b>Grid Code Review Panel</b> has voted not to approve.
<b>Related Person</b>	means, in relation to an individual, any member of his immediate family, his employer (and any former employer of his within the previous 12 months), any partner with whom he is in partnership, and any company or Affiliate of a company in which he or any member of his immediate family controls more than 20% of the voting rights in respect of the shares of the company;
<b>Relevant E&amp;W Transmission Licensee</b>	As the context requires <b>NGET</b> and/or an <b>E&amp;W Offshore Transmission Licensee</b> .
<b>Relevant Party</b>	Has the meaning given in GR15.10(a).
<b>Relevant Scottish Transmission Licensee</b>	As the context requires <b>SPT</b> and/or <b>SHETL</b> and/or a <b>Scottish Offshore Transmission Licensee</b> .

<b>Relevant Transmission Licensee</b>	Means SP Transmission Ltd ( <b>SPT</b> ) in its <b>Transmission Area</b> or Scottish Hydro-Electric Transmission Ltd ( <b>SHETL</b> ) in its <b>Transmission Area</b> or any <b>Offshore Transmission Licensee</b> in its <b>Transmission Area</b> .
<b>Relevant Unit</b>	As defined in the <b>STC</b> , Schedule 3.
<b>Remote End HVDC Converter Station</b>	An <b>HVDC Converter Station</b> which forms part of an <b>HVDC System</b> and is not directly connected to the AC part of the <b>GB Synchronous Area</b> .
<b>Remote Transmission Assets</b>	Any <b>Plant</b> and <b>Apparatus</b> or meters owned by <b>NGET</b> which: <ul style="list-style-type: none"> <li>(a) are <b>Embedded</b> in a <b>User System</b> and which are not directly connected by <b>Plant</b> and/or <b>Apparatus</b> owned by <b>NGET</b> to a sub-station owned by <b>NGET</b>; and</li> <li>(b) are by agreement between <b>NGET</b> and such <b>User</b> operated under the direction and control of such <b>User</b>.</li> </ul>
<b>Requesting Safety Co-ordinator</b>	The <b>Safety Co-ordinator</b> requesting <b>Safety Precautions</b> .
<b>Responsible Engineer/ Operator</b>	A person nominated by a <b>User</b> to be responsible for <b>System</b> control.
<b>Responsible Manager</b>	A manager who has been duly authorised by a <b>User</b> or <b>NGET</b> to sign <b>Site Responsibility Schedules</b> on behalf of that <b>User</b> or <b>NGET</b> , as the case may be.  For <b>Connection Sites</b> in Scotland and <b>Offshore</b> a manager who has been duly authorised by the <b>Relevant Transmission Licensee</b> to sign <b>Site Responsibility Schedules</b> on behalf of that <b>Relevant Transmission Licensee</b> .
<b>Re-synchronisation</b>	The bringing of parts of the <b>System</b> which have become <b>Out of Synchronism</b> with any other <b>System</b> back into <b>Synchronism</b> , and like terms shall be construed accordingly.
<b>Safety Co-ordinator</b>	A person or persons nominated by a <b>Relevant E&amp;W Transmission Licensee</b> and each <b>E&amp;W User</b> in relation to <b>Connection Points</b> (or in the case of <b>OTSUA</b> operational prior to the <b>OTSUA Transfer Time, Transmission Interface Points</b> ) on an <b>E&amp;W Transmission System</b> and/or by the <b>Relevant Scottish Transmission Licensee</b> and each <b>Scottish User</b> in relation to <b>Connection Points</b> (or in the case of <b>OTSUA</b> operational prior to the <b>OTSUA Transfer Time, Transmission Interface Points</b> ) on a <b>Scottish Transmission System</b> to be responsible for the co-ordination of <b>Safety Precautions</b> at each <b>Connection Point</b> (or in the case of <b>OTSUA</b> operational prior to the <b>OTSUA Transfer Time, Transmission Interface Points</b> ) when work (which includes testing) is to be carried out on a <b>System</b> which necessitates the provision of <b>Safety Precautions</b> on <b>HV Apparatus</b> (as defined in OC8A.1.6.2 and OC8B.1.7.2), pursuant to <b>OC8</b> .
<b>Safety From The System</b>	That condition which safeguards persons when work is to be carried out on or near a <b>System</b> from the dangers which are inherent in the <b>System</b> .

<b>Safety Key</b>	A key unique at the <b>Location</b> capable of operating a lock which will cause an <b>Isolating Device</b> and/or <b>Earthing Device</b> to be <b>Locked</b> .
<b>Safety Log</b>	A chronological record of messages relating to safety co-ordination sent and received by each <b>Safety Co-ordinator</b> under <b>OC8</b> .
<b>Safety Precautions</b>	<b>Isolation</b> and/or <b>Earthing</b> .
<b>Safety Rules</b>	The rules of <b>NGET</b> (in England and Wales) and the <b>Relevant Transmission Licensee</b> (in Scotland or <b>Offshore</b> ) or a <b>User</b> that seek to ensure that persons working on <b>Plant</b> and/or <b>Apparatus</b> to which the rules apply are safeguarded from hazards arising from the <b>System</b> .
<b>Scottish Offshore Transmission System</b>	An <b>Offshore Transmission System</b> with an <b>Interface Point</b> in Scotland.
<b>Scottish Offshore Transmission Licensee</b>	A person who owns or operates a <b>Scottish Offshore Transmission System</b> pursuant to a <b>Transmission Licence</b> .
<b>Scottish Transmission System</b>	Collectively <b>SPT's Transmission System</b> and <b>SHETL's Transmission System</b> and any <b>Scottish Offshore Transmission Systems</b> .
<b>Scottish User</b>	A <b>User</b> in Scotland or any <b>Offshore User</b> who owns or operates <b>Plant</b> and/or <b>Apparatus</b> connected (or which will at the <b>OTSUA Transfer Time</b> be connected) to a <b>Scottish Offshore Transmission System</b>
<b>Secondary Response</b>	The automatic increase in <b>Active Power</b> output of a <b>Genset</b> or, as the case may be, the decrease in <b>Active Power Demand</b> in response to a <b>System Frequency</b> fall. This increase in <b>Active Power</b> output or, as the case may be, the decrease in <b>Active Power Demand</b> must be in accordance with the provisions of the relevant <b>Ancillary Services Agreement</b> which will provide that it will be fully available by 30 seconds from the time of the start of the <b>Frequency</b> fall and be sustainable for at least a further 30 minutes. The interpretation of the <b>Secondary Response</b> to a -0.5 Hz frequency change is shown diagrammatically in Figure CC.A.3.2 or Figure ECC.A.3.2.
<b>Secretary of State</b>	Has the same meaning as in the <b>Act</b> .
<b>Secured Event</b>	Has the meaning set out in the <b>Security and Quality of Supply Standard</b> .
<b>Security and Quality of Supply Standard (SQSS)</b>	The version of the document entitled 'Security and Quality of Supply Standard' established pursuant to the <b>Transmission Licence</b> in force at the time of entering into the relevant <b>Bilateral Agreement</b> .

<b>Self-Governance Criteria</b>	<p>A proposed <b>Modification</b> that, if implemented,</p> <p>(a) is unlikely to have a material effect on:</p> <ul style="list-style-type: none"> <li>(i) existing or future electricity consumers; and</li> <li>(ii) competition in the generation, distribution, or supply of electricity or any commercial activities connected with the generation, distribution or supply of electricity; and</li> <li>(iii) the operation of the <b>National Electricity Transmission System</b>; and</li> <li>(iv) matters relating to sustainable development, safety or security of supply, or the management of market or network emergencies; and</li> <li>(v) the <b>Grid Code's</b> governance procedures or the <b>Grid Code's</b> modification procedures, and</li> </ul> <p>(b) is unlikely to discriminate between different classes of Users.</p>
<b>Self-Governance Modifications</b>	<p>A <b>Grid Code Modification Proposal</b> that does not fall within the scope of a <b>Significant Code Review</b> and that meets the <b>Self-Governance Criteria</b> or which the <b>Authority</b> directs is to be treated as such any direction under GR.24.4.</p>
<b>Self-Governance Statement</b>	<p>The statement made by the <b>Grid Code Review Panel</b> and submitted to the <b>Authority</b>:</p> <p>(a) confirming that, in its opinion, the <b>Self-Governance Criteria</b> are met and the proposed <b>Grid Code Modification Proposal</b> is suitable for the Self-Governance route; and</p> <p>(b) providing a detailed explanation of the <b>Grid Code Review Panel's</b> reasons for that opinion</p>
<b>Setpoint Voltage</b>	<p>The value of voltage at the <b>Grid Entry Point</b>, or <b>User System Entry Point</b> if <b>Embedded</b>, on the automatic control system steady state operating characteristic, as a percentage of the nominal voltage, at which the transfer of <b>Reactive Power</b> between a <b>Power Park Module</b>, <b>DC Converter</b>, <b>HVDC Converter</b> or <b>Non-Synchronous Generating Unit</b> and the <b>Transmission System</b>, or <b>Network Operator's</b> system if <b>Embedded</b>, is zero.</p>
<b>Settlement Period</b>	<p>A period of 30 minutes ending on the hour and half-hour in each hour during a day.</p>
<b>Seven Year Statement</b>	<p>A statement, prepared by <b>NGET</b> in accordance with the terms of <b>NGET's Transmission Licence</b>, showing for each of the seven succeeding <b>Financial Years</b>, the opportunities available for connecting to and using the <b>National Electricity Transmission System</b> and indicating those parts of the <b>National Electricity Transmission System</b> most suited to new connections and transport of further quantities of electricity.</p>

<b>SF<sub>6</sub> Gas Zone</b>	A segregated zone surrounding electrical conductors within a casing containing SF <sub>6</sub> gas.
<b>SHETL</b>	Scottish Hydro-Electric Transmission Limited
<b>Shutdown</b>	The condition of a <b>Generating Unit</b> where the generator rotor is at rest or on barring.
<b>Significant Code Review</b>	Means the period commencing on the start date of a <b>Significant Code Review</b> as stated in the notice issued by the <b>Authority</b> , and ending in the circumstances described in GR.16.6 or GR.16.7, as appropriate.
<b>Significant Code Review Phase</b>	Means the period commencing on the start date of a <b>Significant Code Review</b> as stated in the notice issued by the <b>Authority</b> , and ending in the circumstances described in GR.16.6 or GR.16.7, as appropriate.
<b>Significant Incident</b>	An <b>Event</b> which either: <ul style="list-style-type: none"> <li>(a) was notified by a <b>User</b> to <b>NGET</b> under <b>OC7</b>, and which <b>NGET</b> considers has had or may have had a significant effect on the <b>National Electricity Transmission System</b>, and <b>NGET</b> requires the <b>User</b> to report that <b>Event</b> in writing in accordance with <b>OC10</b> and notifies the <b>User</b> accordingly; or</li> <li>(b) was notified by <b>NGET</b> to a <b>User</b> under <b>OC7</b>, and which that <b>User</b> considers has had or may have had a significant effect on that <b>User's System</b>, and that <b>User</b> requires <b>NGET</b> to report that <b>Event</b> in writing in accordance with the provisions of <b>OC10</b> and notifies <b>NGET</b> accordingly.</li> </ul>
<b>Simultaneous Tap Change</b>	A tap change implemented on the generator step-up transformers of <b>Synchronised Gensets</b> , effected by <b>Generators</b> in response to an instruction from <b>NGET</b> issued simultaneously to the relevant <b>Power Stations</b> . The instruction, preceded by advance notice, must be effected as soon as possible, and in any event within one minute of receipt from <b>NGET</b> of the instruction.
<b>Single Line Diagram</b>	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 <b>Large Power Stations</b> are connected, and the points at which <b>Demand</b> is supplied.
<b>Single Point of Connection</b>	A single <b>Point of Connection</b> , with no interconnection through the <b>User's System</b> to another <b>Point of Connection</b> .
<b>Site Common Drawings</b>	Drawings prepared for each <b>Connection Site</b> (and in the case of <b>OTSDUW, Transmission Interface Site</b> ) which incorporate <b>Connection Site</b> (and in the case of <b>OTSDUW, Transmission Interface Site</b> ) layout drawings, electrical layout drawings, common protection/ control drawings and common services drawings.

<b>Site Responsibility Schedule</b>	A schedule containing the information and prepared on the basis of the provisions set out in Appendix 1 of the <b>CC</b> and Appendix E1 of the <b>ECC</b> .
<b>Slope</b>	The ratio of the steady state change in voltage, as a percentage of the nominal voltage, to the steady state change in <b>Reactive Power</b> output, in per unit of <b>Reactive Power</b> capability. For the avoidance of doubt, the value indicates the percentage voltage reduction that will result in a 1 per unit increase in <b>Reactive Power</b> generation.
<b>Small Participant</b>	Has the meaning given in the <b>CUSC</b> .

<p><b>Small Power Station</b></p>	<p>A <b>Power Station</b> which is</p> <p>(a) directly connected to:</p> <ul style="list-style-type: none"> <li>(i) <b>NGET's Transmission System</b> where such <b>Power Station</b> has a <b>Registered Capacity</b> of less than 50MW; or</li> <li>(ii) <b>SPT's Transmission System</b> where such <b>Power Station</b> has a <b>Registered Capacity</b> of less than 30MW; or</li> <li>(iii) <b>SHETL's Transmission System</b> where such a <b>Power Station</b> has a <b>Registered Capacity</b> of less than 10 MW; or</li> <li>(iv) an <b>Offshore Transmission System</b> where such <b>Power Station</b> has a <b>Registered Capacity</b> of less than 10MW;</li> </ul> <p>or,</p> <p>(b) <b>Embedded</b> within a <b>User System</b> (or part thereof) where such <b>User System</b> (or part thereof) is connected under normal operating conditions to:</p> <ul style="list-style-type: none"> <li>(i) <b>NGET's Transmission System</b> and such <b>Power Station</b> has a <b>Registered Capacity</b> of less than 50MW; or</li> <li>(ii) <b>SPT's Transmission System</b> and such <b>Power Station</b> has a <b>Registered Capacity</b> of less than 30MW; or</li> <li>(iii) <b>SHETL's Transmission System</b> and such <b>Power Station</b> has a <b>Registered Capacity</b> of less than 10MW;</li> </ul> <p>or,</p> <p>(c) <b>Embedded</b> within a <b>User System</b> (or part thereof) where the <b>User System</b> (or part thereof) is not connected to the <b>National Electricity Transmission System</b>, although such <b>Power Station</b> is in:</p> <ul style="list-style-type: none"> <li>(i) <b>NGET's Transmission Area</b> and such <b>Power Station</b> has a <b>Registered Capacity</b> of less than 50MW; or</li> <li>(ii) <b>SPT's Transmission Area</b> and such <b>Power Station</b> has a <b>Registered Capacity</b> of less than 30MW; or</li> <li>(iii) <b>SHETL's Transmission Area</b> and such <b>Power Station</b> has a <b>Registered Capacity</b> of less than 10MW;</li> </ul> <p><u>For the avoidance of doubt a <b>Small Power Station</b> could comprise of <b>Type A, Type B, Type C</b> or <b>Type D Power Generating Modules</b>.</u></p>
<p><b>Speeder Motor Setting Range</b></p>	<p>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 <b>Generating Unit</b> terminals are on open circuit.</p>
<p><b>SPT</b></p>	<p>SP Transmission Limited</p>

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<b>Standard Modifications</b>	A <b>Grid Code Modification Proposal</b> that does not fall within the scope of a <b>Significant Code Review</b> subject to any direction by the <b>Authority</b> pursuant to GR.16.3 and GR.16.4, nor meets the <b>Self-Governance Criteria</b> subject to any direction by the <b>Authority</b> pursuant to GR.24.4 and in accordance with any direction under GR.24.2.
<b>Standard Planning Data</b>	The general data required by <b>NGET</b> under the <b>PC</b> . It is generally also the data which <b>NGET</b> requires from a new <b>User</b> in an application for a <b>CUSC Contract</b> , as reflected in the <b>PC</b> .
<b>Start Time</b>	The time named as such in an instruction issued by <b>NGET</b> pursuant to the <b>BC</b> .
<b>Start-Up</b>	The action of bringing a <b>Generating Unit</b> from <b>Shutdown</b> to <b>Synchronous Speed</b> .
<b>Statement of Readiness</b>	Has the meaning set out in the <b>Bilateral Agreement</b> and/or <b>Construction Agreement</b> .
<b>Station Board</b>	A switchboard through which electrical power is supplied to the <b>Auxiliaries</b> of a <b>Power Station</b> , and which is supplied by a <b>Station Transformer</b> . It may be interconnected with a <b>Unit Board</b> .
<b>Station Transformer</b>	A transformer supplying electrical power to the <b>Auxiliaries</b> of (a) a <b>Power Station</b> , which is not directly connected to the <b>Generating Unit</b> terminals (typical voltage ratios being 132/11kV or 275/11kV), or (b) a <b>DC Converter Station</b> or <b>HVDC Converter Station</b> .
<b>STC Committee</b>	The committee established under the <b>STC</b> .
<b>Steam Unit</b>	A <b>Generating Unit</b> whose prime mover converts the heat-energy in steam to mechanical energy.
<b>Subtransmission System</b>	The part of a <b>User's System</b> which operates at a single transformation below the voltage of the relevant <b>Transmission System</b> .
<b>Substantial Modification</b>	A <b>Modification</b> in relation to modernisation or replacement of the <b>User's Main Plant and Apparatus</b> , which, following notification by the relevant <b>User</b> to <b>NGET</b> , results in substantial amendment to the <b>Bilateral Agreement</b> and which need not have a <b>Material Effect</b> on <b>NGET</b> or a <b>User</b> . Any actual or proposed replacement which results in the installation of new <b>Main Plant and Apparatus</b> .
<b>Supergrid Voltage</b>	Any voltage greater than 200kV.

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<b>Supplier</b>	<p>(a) A person supplying electricity under an <b>Electricity Supply Licence</b>; or</p> <p>(b) A person supplying electricity under exemption under the <b>Act</b>; in each case acting in its capacity as a supplier of electricity to <b>Customers in Great Britain</b>.</p>
<b>Surplus</b>	<p>A MW figure relating to a <b>System Zone</b> equal to the total <b>Output Usable</b> in the <b>System Zone</b>:</p> <p>(a) minus the forecast of <b>Active Power Demand</b> in the <b>System Zone</b>, and</p> <p>(b) minus the export limit in the case of an export limited <b>System Zone</b>, or plus the import limit in the case of an import limited <b>System Zone</b>, and</p> <p>(c) (only in the case of a <b>System Zone</b> comprising the <b>National Electricity Transmission System</b>) minus the <b>Operational Planning Margin</b>.</p> <p>For the avoidance of doubt, a <b>Surplus</b> of more than zero in an export limited <b>System Zone</b> indicates an excess of generation in that <b>System Zone</b>; and a <b>Surplus</b> of less than zero in an import limited <b>System Zone</b> indicates insufficient generation in that <b>System Zone</b>.</p>
<b>Synchronised</b>	<p>(a) The condition where an incoming <b>Power Generating Module, Generating Unit or Power Park Module or DC Converter or HVDC Converter or System</b> is connected to the busbars of another <b>System</b> so that the <b>Frequencies</b> and phase relationships of that <b>Power Generating Module, Generating Unit, Power Park Module, DC Converter, HVDC Converter or System</b>, as the case may be, and the <b>System</b> to which it is connected are identical, like terms shall be construed accordingly e.g. “<b>Synchronism</b>”.</p> <p>(b) The condition where an importing <b>BM Unit</b> is consuming electricity.</p>
<b>Synchronising Generation</b>	The amount of MW (in whole MW) produced at the moment of synchronising.
<b>Synchronising Group</b>	A group of two or more <b>Gensets</b> ) which require a minimum time interval between their <b>Synchronising or De-Synchronising</b> times.
<b>Synchronous Area</b>	An area covered by synchronously interconnected <b>Transmission Licensees</b> , such as the <b>Synchronous Areas</b> of Continental Europe, Great Britain, Ireland-Northern Ireland and Nordic and the power systems of Lithuania, Latvia and Estonia, together referred to as ‘Baltic’ which are part of a wider <b>Synchronous Area</b> ;

<b>Synchronous Compensation</b>	The operation of rotating synchronous <b>Apparatus</b> for the specific purpose of either the generation or absorption of <b>Reactive Power</b> .
<b>Synchronous Generating Unit</b>	Any <b>Onshore Synchronous Generating Unit</b> or <b>Offshore Synchronous Generating Unit</b> .
<b>Synchronous Generating Unit Performance Chart</b>	<u>A diagram showing the <b>Real Power (MW)</b> and <b>Reactive Power (MVar)</b> capability limits within which a <b>Synchronous Generating Unit</b> at its stator terminals (which is part of a <b>Synchronous Power Generating Module</b>) will be expected to operate under steady state conditions.</u>
<b>Synchronous Power-Generating Module</b>	An indivisible set of installations which can generate electrical energy such that the frequency of the generated voltage, the generator speed and the frequency of network voltage are in a constant ratio and thus in synchronism. For the avoidance of doubt a <b>Synchronous Power Generating Module</b> could comprise of one or more <b>Synchronous Generating Units</b>
<b>Synchronous Power Generating Module Matrix</b>	The matrix described in Appendix 1 to BC1 under the heading <b>Synchronous Power Generating Module Matrix</b> .
<b>Synchronous Power Generating Module Planning Matrix</b>	A matrix in the form set out in Appendix 5 of OC2 showing the combination of <b>Synchronous Generating Units</b> within a <b>Synchronous Power Generating Module</b> which would be running in relation to any given MW output.
<b>Synchronous Power Generating Unit</b>	Has the same meaning as a <b>Synchronous Generating Unit</b> and would be considered to be part of a <b>Power Generating Module</b> .
<b>Synchronous Speed</b>	That speed required by a <b>Generating Unit</b> to enable it to be <b>Synchronised</b> to a <b>System</b> .
<b>System</b>	Any <b>User System</b> and/or the <b>National Electricity Transmission System</b> , as the case may be.
<b>System Ancillary Services</b>	Collectively <b>Part 1 System Ancillary Services</b> and <b>Part 2 System Ancillary Services</b> .
<b>System Constraint</b>	A limitation on the use of a <b>System</b> due to lack of transmission capacity or other <b>System</b> conditions.
<b>System Constrained Capacity</b>	That portion of <b>Registered Capacity</b> or <b>Registered Import Capacity</b> not available due to a <b>System Constraint</b> .
<b>System Constraint Group</b>	A part of the <b>National Electricity Transmission System</b> which, because of <b>System Constraints</b> , is subject to limits of <b>Active Power</b> which can flow into or out of (as the case may be) that part.

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<b>System Fault Dependability Index or Dp</b>	<p>A measure of the ability of <b>Protection</b> to initiate successful tripping of circuit-breakers which are associated with a faulty item of <b>Apparatus</b>. It is calculated using the formula:</p> $Dp = 1 - F_1/A$ <p>Where:</p> <p>A = Total number of <b>System</b> faults</p> <p>F<sub>1</sub> = Number of <b>System</b> faults where there was a failure to trip a circuit-breaker.</p>
<b>System Margin</b>	<p>The margin in any period between</p> <p>(a) the sum of Maximum Export Limits and</p> <p>(b) forecast <b>Demand</b> and the <b>Operating Margin</b>,</p> <p>for that period.</p>
<b>System Negative Reserve Active Power Margin or System NRAPM</b>	<p>That margin of <b>Active Power</b> sufficient to allow the largest loss of <b>Load</b> at any time.</p>
<b>System Operator - Transmission Owner Code or STC</b>	<p>Has the meaning set out in <b>NGET's Transmission Licence</b></p>
<b>System Telephony</b>	<p>An alternative method by which a <b>User's Responsible Engineer/Operator</b> and <b>NGET Control Engineer(s)</b> speak to one and another for the purposes of control of the <b>Total System</b> in both normal operating conditions and where practicable, emergency operating conditions.</p>
<b>System Tests</b>	<p>Tests which involve simulating conditions, or the controlled application of irregular, unusual or extreme conditions, on the <b>Total System</b>, or any part of the <b>Total System</b>, but which do not include commissioning or recommissioning tests or any other tests of a minor nature.</p>
<b>System to Demand Intertrip Scheme</b>	<p>An intertrip scheme which disconnects <b>Demand</b> when a <b>System</b> fault has arisen to prevent abnormal conditions occurring on the <b>System</b>.</p>
<b>System to Generator Operational Intertripping</b>	<p>A <b>Balancing Service</b> involving the initiation by a <b>System to Generator Operational Intertripping Scheme</b> of automatic tripping of the <b>User's</b> circuit breaker(s), or <b>Relevant Transmission Licensee's</b> circuit breaker(s) where agreed by <b>NGET</b>, the <b>User</b> and the <b>Relevant Transmission Licensee</b>, resulting in the tripping of <b>BM Unit(s)</b> or (where relevant) <b>Generating Unit(s)</b> comprised in a <b>BM Unit</b> to prevent abnormal system conditions occurring, such as over voltage, overload, <b>System</b> instability, etc, after the tripping of other circuit-breakers following power <b>System</b> fault(s).</p>

<b>System to Generator Operational Intertripping Scheme</b>	A <b>System to Generating Unit</b> or <b>System to CCGT Module</b> or <b>System to Power Park Module</b> or <b>System to Power Generating Module Intertripping Scheme</b> forming a condition of connection and specified in Appendix F3 of the relevant <b>Bilateral Agreement</b> , being either a <b>Category 1 Intertripping Scheme</b> , <b>Category 2 Intertripping Scheme</b> , <b>Category 3 Intertripping Scheme</b> or <b>Category 4 Intertripping Scheme</b> .
<b>System Zone</b>	A region of the <b>National Electricity Transmission System</b> within a described boundary or the whole of the <b>National Electricity Transmission System</b> , as further provided for in OC2.2.4, and the term "Zonal" will be construed accordingly.
<b>Target Frequency</b>	That <b>Frequency</b> determined by <b>NGET</b> , in its reasonable opinion, as the desired operating <b>Frequency</b> of the <b>Total System</b> . This will normally be 50.00Hz plus or minus 0.05Hz, except in exceptional circumstances as determined by <b>NGET</b> , 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 <b>System</b> during disputes affecting fuel supplies.
<b>Technical Specification</b>	In relation to <b>Plant</b> and/or <b>Apparatus</b> , (a) the relevant <b>European Specification</b> ; or (b) if there is no relevant <b>European Specification</b> , other relevant standards which are in common use in the European Community.
<b>Test Co-ordinator</b>	A person who co-ordinates <b>System Tests</b> .
<b>Test Panel</b>	A panel, whose composition is detailed in <b>OC12</b> , which is responsible, inter alia, for considering a proposed <b>System Test</b> , and submitting a <b>Proposal Report</b> and a <b>Test Programme</b> .
<b>Test Programme</b>	A programme submitted by the <b>Test Panel</b> to <b>NGET</b> , the <b>Test Proposer</b> , and each <b>User</b> identified by <b>NGET</b> 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 <b>System Test</b> (including those responsible for the site safety) and such other matters as the <b>Test Panel</b> deems appropriate.
<b>Test Proposer</b>	The person who submits a <b>Proposal Notice</b> .
<b>Total Shutdown</b>	The situation existing when all generation has ceased and there is no electricity supply from <b>External Interconnections</b> and, therefore, the <b>Total System</b> has shutdown with the result that it is not possible for the <b>Total System</b> to begin to function again without <b>NGET's</b> directions relating to a <b>Black Start</b> .
<b>Total System</b>	The <b>National Electricity Transmission System</b> and all <b>User Systems</b> in the <b>National Electricity Transmission System Operator Area</b> .
<b>Trading Point</b>	A commercial and, where so specified in the Grid Code, an operational interface between a <b>User</b> and <b>NGET</b> , which a <b>User</b> has notified to <b>NGET</b> .

<b>Transfer Date</b>	Such date as may be appointed by the <b>Secretary of State</b> by order under section 65 of the <b>Act</b> .
<b>Transmission</b>	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 <b>National Electricity Transmission System</b> , and not of or with the <b>User System</b> .
<b>Transmission Area</b>	Has the meaning set out in the <b>Transmission Licence</b> of a <b>Transmission Licensee</b> .
<b>Transmission Connected Demand Facilities</b>	A <b>Demand Facility</b> which has a <b>Grid Supply Point</b> connection point to the <b>National Electricity Transmission System</b>
<b>Transmission DC Converter</b>	Any <b>Transmission Licensee Apparatus</b> (or <b>OTSUA</b> that will become <b>Transmission Licensee Apparatus</b> at the <b>OTSUA Transfer Time</b> ) used to convert alternating current electricity to direct current electricity, or vice versa. A <b>Transmission Network DC Converter</b> (which could include an <b>HVDC System</b> owned by an <b>Offshore Transmission Licensee</b> or <b>Generator</b> in respect of <b>OTSUA</b> ) is a standalone operative configuration at a single site comprising one or more converter bridges, together with one or more converter transformers, converter control equipment, essential protective and switching devices and auxiliaries, if any, used for conversion.
<b>Transmission Entry Capacity</b>	Has the meaning set out in the <b>CUSC</b> .
<b>Transmission Interface Circuit</b>	In <b>NGET's Transmission Area</b> , a <b>Transmission</b> circuit which connects a <b>System</b> operating at a voltage above 132kV to a <b>System</b> operating at a voltage of 132kV or below  In <b>SHETL's Transmission Area</b> and <b>SPT's Transmission Area</b> , a <b>Transmission</b> circuit which connects a <b>System</b> operating at a voltage of 132kV or above to a <b>System</b> operating at a voltage below 132kV.
<b>Transmission Interface Point</b>	means the electrical point of connection between the <b>Offshore Transmission System</b> and an <b>Onshore Transmission System</b> .
<b>Transmission Interface Site</b>	the site at which the <b>Transmission Interface Point</b> is located.
<b>Transmission Licence</b>	A licence granted under Section 6(1)(b) of the <b>Act</b> .
<b>Transmission Licensee</b>	Any <b>Onshore Transmission Licensee</b> or <b>Offshore Transmission Licensee</b>

<b>Transmission Site</b>	<p>In England and Wales, means a site owned (or occupied pursuant to a lease, licence or other agreement) by <b>NGET</b> in which there is a <b>Connection Point</b>. For the avoidance of doubt, a site owned by a <b>User</b> but occupied by <b>NGET</b> as aforesaid, is a <b>Transmission Site</b>.</p> <p>In Scotland and <b>Offshore</b>, means a site owned (or occupied pursuant to a lease, licence or other agreement) by a <b>Relevant Transmission Licensee</b> in which there is a <b>Connection Point</b>. For the avoidance of doubt, a site owned by a <b>User</b> but occupied by the <b>Relevant Transmission Licensee</b> as aforesaid, is a <b>Transmission Site</b>.</p>
<b>Transmission System</b>	Has the same meaning as the term "licensee's transmission system" in the <b>Transmission Licence</b> of a <b>Transmission Licensee</b> .
<b>Turbine Time Constant</b>	Determined at <b>Registered Capacity</b> , the turbine time constant will be construed in accordance with the principles of the IEEE Committee Report "Dynamic Models for Steam and Hydro Turbines in Power System Studies" published in 1973 which apply to such phrase.
<b>Type A Power Generating Module</b>	A <b>Power-Generating Module</b> with a <b>Grid Entry Point</b> or <b>User System Entry Point</b> below 110 kV and a <b>Maximum Capacity</b> of 0.8 kW or greater but less than 1MW;
<b>Type B Power Generating Module</b>	A <b>Power-Generating Module</b> with a <b>Grid Entry Point</b> or <b>User System Entry Point</b> below 110 kV and a <b>Maximum Capacity</b> of 1MW or greater but less than 50MW;
<b>Type C Power Generating Module</b>	A <b>Power-Generating Module</b> with a <b>Grid Entry Point</b> or <b>User System Entry Point</b> below 110 kV and a <b>Maximum Capacity</b> of 50MW or greater but less than 75MW;
<b>Type D Power Generating Module</b>	A <b>Power-generating Module</b> : with a <b>Grid Entry Point</b> or <b>User System Entry Point</b> at, or greater than, 110 kV; or with a <b>Grid Entry Point</b> or <b>User System Entry Point</b> below 110 kV and with <b>MaximumRegistered Capacity</b> of 75MW or greater
<b>Unbalanced Load</b>	The situation where the <b>Load</b> on each phase is not equal.
<b>Under-excitation Limiter</b>	Shall have the meaning ascribed to that term in <b>IEC 34-16-1:1991</b> [equivalent to <b>British Standard BS4999 Section 116.1 : 1992</b> ].
<b>Under Frequency Relay</b>	An electrical measuring relay intended to operate when its characteristic quantity ( <b>Frequency</b> ) reaches the relay settings by decrease in <b>Frequency</b> .
<b>Unit Board</b>	A switchboard through which electrical power is supplied to the <b>Auxiliaries</b> of a <b>Generating Unit</b> and which is supplied by a <b>Unit Transformer</b> . It may be interconnected with a <b>Station Board</b> .
<b>Unit Transformer</b>	A transformer directly connected to a <b>Generating Unit's</b> terminals, and which supplies power to the <b>Auxiliaries</b> of a <b>Generating Unit</b> . Typical voltage ratios are 23/11kV and 15/6.6Kv.

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

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<b>User Site</b>	<p>In England and Wales, a site owned (or occupied pursuant to a lease, licence or other agreement) by a <b>User</b> in which there is a <b>Connection Point</b>. For the avoidance of doubt, a site owned by <b>NGET</b> but occupied by a <b>User</b> as aforesaid, is a <b>User Site</b>.</p> <p>In Scotland and <b>Offshore</b>, a site owned (or occupied pursuant to a lease, licence or other agreement) by a <b>User</b> in which there is a <b>Connection Point</b>. For the avoidance of doubt, a site owned by a <b>Relevant Transmission Licensee</b> but occupied by a <b>User</b> as aforesaid, is a <b>User Site</b>.</p>
<b>User System</b>	<p>Any system owned or operated by a <b>User</b> comprising:-</p> <p>(a) <b>Power Generating Modules</b> or <b>Generating Units</b>; and/or</p> <p>(b) Systems consisting (wholly or mainly) of electric lines used for the distribution of electricity from <b>Grid Supply Points</b> or <b>Generating Units</b> or <b>Power Generating Modules</b> or other entry points to the point of delivery to <b>Customers</b>, or other <b>Users</b>;</p> <p>and <b>Plant</b> and/or <b>Apparatus</b> <del>Apparatus</del> (including prior to the <b>OTSUA Transfer Time</b>, any <b>OTSUA</b>) connecting:-</p> <p>(c) The system as described above; or</p> <p>(d) <b>Non-Embedded Customers</b> equipment;</p> <p>to the <b>National Electricity Transmission System</b> or to the relevant other <b>User System</b>, as the case may be.</p> <p>The <b>User System</b> includes any <b>Remote Transmission Assets</b> operated by such <b>User</b> or other person and any <b>Plant</b> and/or <b>Apparatus</b> and meters owned or operated by the <b>User</b> or other person in connection with the distribution of electricity but does not include any part of the <b>National Electricity Transmission System</b>.</p>
<b>User System Entry Point</b>	<p>A point at which a <b>Power Generating Module</b>, <b>Generating Unit</b>, a <b>CCGT Module</b> or a <b>CCGT Unit</b> or a <b>Power Park Module</b> or a <b>DC Converter</b> or an <b>HVDC Converter</b>, as the case may be, which is <b>Embedded</b> connects to the <b>User System</b>.</p>
<b>Water Time Constant</b>	<p>Bears the meaning ascribed to the term "Water inertia time" in IEC308.</p>
<b>Website</b>	<p>The site established by <b>NGET</b> on the World-Wide Web for the exchange of information among <b>Users</b> and other interested persons in accordance with such restrictions on access as may be determined from time to time by <b>NGET</b>.</p>

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<b>Weekly ACS Conditions</b>	Means that particular combination of weather elements that gives rise to a level of peak <b>Demand</b> 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 <b>Demand</b> in all weeks of the year exceeding the annual peak <b>Demand</b> under <b>Annual ACS Conditions</b> is 50%, and in the week of maximum risk the weekly peak <b>Demand</b> under <b>Weekly ACS Conditions</b> is equal to the annual peak <b>Demand</b> under <b>Annual ACS Conditions</b> .
<b>WG Consultation Alternative Request</b>	Any request from an <b>Authorised Electricity Operator</b> ; the <b>Citizens Advice</b> or the <b>Citizens Advice Scotland</b> , <b>NGET</b> or a <b>Materially Affected Party</b> for a <b>Workgroup Alternative Grid Code Modification</b> to be developed by the <b>Workgroup</b> expressed as such and which contains the information referred to at GR.20.13. For the avoidance of doubt any <b>WG Consultation Alternative Request</b> does not constitute either a <b>Grid Code Modification Proposal</b> or a <b>Workgroup Alternative Grid Code Modification</b>
<b>Workgroup</b>	a <b>Workgroup</b> established by the <b>Grid Code Review Panel</b> pursuant to GR.20.1;
<b>Workgroup Consultation</b>	as defined in GR.20.10, and any further consultation which may be directed by the <b>Grid Code Review Panel</b> pursuant to GR.20.17;
<b>Workgroup Alternative Grid Code Modification</b>	an alternative modification to the <b>Grid Code Modification Proposal</b> developed by the <b>Workgroup</b> under the <b>Workgroup</b> terms of reference (either as a result of a <b>Workgroup Consultation</b> or otherwise) and which is believed by a majority of the members of the <b>Workgroup</b> or by the chairman of the <b>Workgroup</b> to better facilitate the <b>Grid Code Objectives</b> than the <b>Grid Code Modification Proposal</b> or the current version of the <b>Grid Code</b> ;
<b>Zonal System Security Requirements</b>	That generation required, within the boundary circuits defining the <b>System Zone</b> , which when added to the secured transfer capability of the boundary circuits exactly matches the <b>Demand</b> within the <b>System Zone</b> .

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.

## GD.2 Construction of References

### GD.2.1 In the Grid Code:

- (i) a table of contents, a Preface, a Revision section, headings, and the Appendix to this **Glossary and Definitions** are inserted for convenience only and shall be ignored in construing the Grid Code;
- (ii) unless the context otherwise requires, all references to a particular paragraph, subparagraph, Appendix or Schedule shall be a reference to that paragraph, subparagraph Appendix or Schedule in or to that part of the Grid Code in which the reference is made;
- (iii) unless the context otherwise requires, the singular shall include the plural and vice versa, references to any gender shall include all other genders and references to persons shall include any individual, body corporate, corporation, joint venture, trust, unincorporated association, organisation, firm or partnership and any other entity, in each case whether or not having a separate legal personality;
- (iv) references to the words "include" or "including" are to be construed without limitation to the generality of the preceding words;
- (v) unless there is something in the subject matter or the context which is inconsistent therewith, any reference to an Act of Parliament or any Section of or Schedule to, or other provision of an Act of Parliament shall be construed at the particular time, as including a reference to any modification, extension or re-enactment thereof then in force and to all instruments, orders and regulations then in force and made under or deriving validity from the relevant Act of Parliament;
- (vi) where the **Glossary and Definitions** refers to any word or term which is more particularly defined in a part of the Grid Code, the definition in that part of the Grid Code will prevail (unless otherwise stated) over the definition in the **Glossary & Definitions** in the event of any inconsistency;
- (vii) a cross-reference to another document or part of the Grid Code shall not of itself impose any additional or further or co-existent obligation or confer any additional or further or co-existent right in the part of the text where such cross-reference is contained;
- (viii) nothing in the Grid Code is intended to or shall derogate from **NGET's** statutory or licence obligations;
- (ix) a "holding company" means, in relation to any person, a holding company of such person within the meaning of section 736, 736A and 736B of the Companies Act 1985 as substituted by section 144 of the Companies Act 1989 and, if that latter section is not in force at the **Transfer Date**, as if such latter section were in force at such date;
- (x) a "subsidiary" means, in relation to any person, a subsidiary of such person within the meaning of section 736, 736A and 736B of the Companies Act 1985 as substituted by section 144 of the Companies Act 1989 and, if that latter section is not in force at the **Transfer Date**, as if such latter section were in force at such date;
- (xi) references to time are to London time; and
- (xii) (a) Save where (b) below applies, where there is a reference to an item of data being expressed in a whole number of MW, fractions of a MW below 0.5 shall be rounded down to the nearest whole MW and fractions of a MW of 0.5 and above shall be rounded up to the nearest whole MW;

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

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

< END OF GLOSSARY & DEFINITIONS >



**EUROPEAN COMPLIANCE PROCESSES**  
**(post RfG Implementation)**

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## EUROPEAN COMPLIANCE PROCESSES

### ECP.1 INTRODUCTION

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ECP.1.1 The **European Compliance Processes** ("ECP") specifies in relation to directly connected and **Embedded Power Stations** (subject to a **Bilateral Agreement**) and **HVDC Systems**:

#### (i) **Type A Power Generating Modules:**

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the process for issuing and receiving an **Installation Document** which must be followed by **NGET** and any **User with a Type A Power Generating Module** to demonstrate its compliance with the **Grid Code** in relation to its **Plant** and **Apparatus** prior to the relevant **Plant** and **Apparatus** being energised.

#### (ii) ~~Type B, or Type C or Power Generating Modules:~~

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~~the process (leading to a Preliminary Operational Notification and Final Operational Notification) which must be followed by NGET and any Generator to demonstrate its compliance with the Grid Code in relation to its Plant and Apparatus. This process shall be followed prior to and during the course of the relevant Plant and Apparatus being energised and Synchronised.~~

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#### ~~(iii) Type D Power Generating Modules and HVDC Systems:~~

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the process (leading to an **Energisation Operational Notification**) which must be followed by **NGET** and any **User with a Type B, Type C or Type D Power Generating Module or HVDC System** to demonstrate its compliance with the **Grid Code** in relation to its **Plant** and **Apparatus** (including any **OTSUA**) prior to the relevant **Plant** and **Apparatus** (including any **OTSUA**) being energised.

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the process (leading to an **Interim Operational Notification** and **Final Operational Notification**) which must be followed by **NGET** and any **User with a Type B, Type C or Type D Power Generating Module or HVDC System Generator** or **HVDC System Owner** to demonstrate its compliance with the **Grid Code** in relation to its **Plant** and **Apparatus** (including and dynamically controlled **OTSUA**). This process shall be followed prior to and during the course of the relevant **Plant** and **Apparatus** (including **OTSUA**) being energised and **Synchronised**.

the process (leading to a **Limited Operational Notification**) which must be followed by **NGET** and each **Generator User with a Type B, Type C or Type D Power Generating Module or HVDC System and HVDC System Owner** where any of its **Plant** and/or **Apparatus** (including any **OTSUA**) becomes unable to comply with relevant provisions of the **Grid Code**, and where applicable with Appendices F1 to F5

of the **Bilateral Agreement** (and in the case of **OTSUA** Appendices OF1 to OF5 of the **Bilateral Agreement**). This process also includes when changes or **Modifications** are made to **Plant** and/or **Apparatus** (including **OTSUA**). This process applies to such **Plant** and/or **Apparatus** after the **Plant** and/or **Apparatus** has become **Operational** and until **Disconnected** from the **Total System**, (or until, in the case of **OTSUA**, the **OTSUA Transfer Time**); when changes or **Modifications** are made.

ECP.1.2 As used in the **ECP** references to **OTSUA** means **OTSUA** to be connected or connected to the **National Electricity Transmission System** prior to the **OTSUA Transfer Time**.

ECP.1.3 Where ~~at~~ **the Generator** or **HVDC System Owner** and/or **NGET** are required to apply for a derogation to the **Authority**, this is not in respect of **OTSUA**.

## ECP.2 OBJECTIVE

ECP.2.1 The objective of the **ECP** is to ensure that there is a clear and consistent process for demonstration of compliance by **UsersEU Code Users** with the **European Connection Conditions** and **Bilateral Agreement** which are similar for all **UsersEU Code Users** of an equivalent category and will enable **NGET** to comply with its statutory and **Transmission Licence** obligations.

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ECP.2.2 Provisions of the **ECP** which apply in relation to **OTSDUW** and **OTSUA** shall (in any particular case) apply up to the **OTSUA Transfer Time**, whereupon such provisions shall (without prejudice to any prior non-compliance) cease to apply.

ECP.2.3 In relation to **OTSDUW**, provisions otherwise to be contained in a **Bilateral Agreement** may be contained in the **Construction Agreement**, and accordingly a reference in the **ECP** to a relevant **Bilateral Agreement** includes the relevant **Construction Agreement**.

## ECP.3 SCOPE

ECP.3.1 The **ECP** applies to **NGET** and to **EU Code Users**, which in the **ECP** means:

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- (a) **Generators** (other than in relation to **Embedded Power Stations** not subject to a **Bilateral Agreement**) including those undertaking **OTSDUW**.
- (b) **Network Operators**;
- (c) **Non-Embedded Customers**;
- (d) **HVDC System Owners** (other than those which only have **Embedded HVDC Systems** not subject to a **Bilateral Agreement**).

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ECP.3.2 The above categories of **UserEU Code User** will become bound by the **ECP** prior to them generating, distributing, supplying or consuming, or in the case of **OTSUA**, transmitting, 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 **UserEU Code Users** actually connected.

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#### ECP.4 CONNECTION PROCESS

ECP.4.1 The **CUSC Contract(s)** contain certain provisions relating to the procedure for connection to the **National Electricity Transmission System** or, in the case of **Embedded Power Stations** or **Embedded HVDC Systems**, becoming operational and include provisions to be complied with by **UserEU Code Users** prior to and during the course of **NGET** notifying the **UserEU Code User** that it has the right to become operational. In addition to such provisions this **ECP** sets out in further detail the processes to be followed to demonstrate compliance. While this **ECP** does not expressly address the processes to be followed in the case **OTSUA** connecting to a **Network Operator's User System** prior to **OTSUA Transfer Time**, the processes to be followed by **NGET** and the **Generator** in respect of **OTSUA** in such circumstances shall be consistent with those set out below by reference **OTSUA** directly connected to the **National Electricity Transmission System**.

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ECP.4.2. The provisions contained in ECP.5 to ECP.7 detail the process to be followed in order for the **UserEU Code User's Plant and Apparatus** (including **OTSUA**) to become operational. This process includes

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(i) the acceptance of an **Installation Document** for a **Type A Power Generating Module**;

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This process includes

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(ii) for energisation an **EON** for **Type B Type C or Type D Power Generating Modules** or **HVDC Equipment** (energisation);

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(iii) for synchronising an **IPON** for (Preliminary connection for **Type B Type C or Type DC Power Generating Modules or HVDC Equipment**) **ION** (interim synchronising) and;

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(iv) for final certification a **FON** (final).

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ECP.4.2.1 The provisions contained in ECP.5 relate to the connection and energisation of **UserEU Code User's Plant and Apparatus** (including **OTSUA**) to the **National Electricity Transmission System** or where **Embedded**, to a **User's System**.

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ECP.4.2.2 The provisions contained in ECP.6, ~~ECP.6A, ECP.6B~~ and ECP.7 provide the process for **Generators** and **HVDC System Owners** to demonstrate compliance with the **Grid Code** and with, where applicable, the **CUSC Contract(s)** prior to and during the course of such **Generator's** or **HVDC System Owner's Plant and Apparatus** (including **OTSUA** up to the **OTSUA Transfer Time**) becoming operational.

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ECP.4.2.3 The provisions contained in ECP.8 detail the process to be followed when:

- (a) a **Generator** or **HVDC System Owner's Plant** and/or **Apparatus** (including the **OTSUA**) is unable to comply with any provisions of the **Grid Code** and **Bilateral Agreement**; or,
- (b) following any notification by a **Generator** or a **HVDC System Owner** under the **PC** of any change to its **Plant** and **Apparatus** (including any **OTSUA**); or,
- (c) a **Modification** to a **Generator** or a **HVDC System Owner's Plant** and/or **Apparatus**.

ECP.4.3 **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** and **Embedded HVDC Equipment** not subject to a **Bilateral Agreement**

ECP.4.3.1 In the case of ~~an~~ **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** and **Embedded HVDC Equipment Stations Systems** not subject to a **Bilateral Agreement**, ensuring the obligations of the **ECC** and Appendix E of the relevant **Bilateral Agreement** between **NGET** and the host **Network Operator** are performed and discharged by the relevant party. For the avoidance of doubt the process in this **ECP** does not apply to ~~an~~ **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** and **Embedded HVDC Equipment** not subject to a **Bilateral Agreement**.

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ECP.5 **ENERGISATION OPERATIONAL NOTIFICATION**

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ECP.5.1 The following provisions apply in relation to the issue of an **Energisation Operational Notification** in respect of a **Power Station** consisting of **Type B, Type C or Type D Power Generating Modules** or an **HVDC System**.

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ECP.5.1.1 Certain provisions relating to the connection and energisation of the ~~User~~ **EU Code User's Plant** and **Apparatus** at the **Connection Site** and **OTSUA** at the **Transmission Interface Point** and in certain cases of **Embedded Plant** and **Apparatus** are specified in the **CUSC** and/or **CUSC Contract(s)**. For other **Embedded Plant** and **Apparatus** the **Distribution Code**, the **DCUSA** and the **Embedded Development Agreement** for the connection specify equivalent provisions. Further detail on this is set out in ECP.5 below.

ECP.5.2 The items for submission prior to the issue of an **Energisation Operational Notification** are set out in ECC.5.2

ECP.5.3 In the case of a **Generator** or **HVDC System Owner** the items referred to in ECC.5.2 shall be submitted using the **Power Generating Module Document or User Data File Structure as applicable.**

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ECP.5.4 Not less than 28 days, or such shorter period as may be acceptable in **NGET's** reasonable opinion, prior to the **EU Code User** wishing to energise its **Plant** and **Apparatus** (including passive **OTSUA**) for the first time the **EU Code User** will submit to

**NGET** a Certificate of Readiness to Energise **High Voltage** Equipment which specifies the items of **Plant** and **Apparatus** (including **OTSUA**) ready to be energised in a form acceptable to **NGET**.

ECP.5.5 If the relevant obligations under the provisions of the **CUSC** and/or **CUSC Contract(s)** and the conditions of ECP.5 have been completed to **NGET's** reasonable satisfaction then **NGET** shall issue an **Energisation Operational Notification**. Any dynamically controlled reactive compensation **OTSUA** (including Statcoms or Static Var Compensators) shall not be **Energised** until the appropriate **Interim Operational Notification** has been issued in accordance with ECP.6.

**ECP.6 OPERATIONAL NOTIFICATION PROCESSES**

**ECP.6.1A OPERATIONAL NOTIFICATION PROCESS (Type A)**

ECP.6.1.1A The following provisions apply in relation to the notification process in respect of a **Power Station** consisting of **Type A Power Generating Modules**.

ECP.6.1.2A Not less than 7 days, or such shorter period as may be acceptable in **NGET's** reasonable opinion, prior to the **Generator** wishing to **Synchronise** its **Plant** and **Apparatus** for the first time the **Generator** will:

- (i) submit to **NGET** a **Notification of the User's Intention to Connect**; and
- (ii) submit to **NGET** an **Installation Document** containing at least but not limited to the items referred to at ECP.6.1.3A.

ECP.6.1.3A Items for submission prior to connection.

ECP.6.1.3.1A Prior to the issue of an acknowledgment to connect the **Generator** must submit to **NGET** to **NGET's** satisfaction an **Installation Document** containing at least but not limited to:

- (i) The location at which the connection is made;
- (ii) The date of the connection;
- (iii) The maximum capacity of the installation in kW;
- (iv) The type of primary energy source;
- (v) The classification of the **Power Generating Module** as an emerging technology;
- (vi) A list of references to **Equipment Certificates** issued by an authorised certifier or otherwise agreed with **NGET** used for equipment that is installed at the site or copies of the relevant **Equipment Certificates** issued by an **Authorised**

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**C**ertifier or otherwise where these are relied upon as part of the evidence of compliance;

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- (vii) As regards equipment used, for which an **Equipment Certificate** has not been received, information shall be provided as directed by ~~the~~ **NET** or the **Relevant Network Operator**; and
- (viii) The contact details of the **Generator** and the installer and their signatures.

ECP.66.1.3.2A The items referred to in ECP.66.1.3A shall be submitted by the **Generator** in the form of an **Installation Document** for each applicable **Power Generating Module**.

ECP.66.1.4A No **Power Generating Module** shall be **Synchronised** to the **Total System** until the later of:

- (a) the date specified by the **Generator** in the **Installation Document** issued in respect of each applicable **Power Generating Module(s)**; and,
- (b) acknowledgement is received from **NET** confirming receipt of the **Installation Document**.

ECP.66.1.5A When the requirements of ECP.66.1.2A to ECP.66.1.4A have been met, **NET** will notify the **Generator** that the **Power Generating Module** may (subject to the **Generator** having fulfilled the requirements of ECP.6.1.3 where that applies) be **Synchronised** to the **Total System**.

ECP.66.1.6A Not less than 7 days, or such shorter period as may be acceptable in **NET's** reasonable opinion, prior to the **Generator** wishing to decommission its **Plant** and **Apparatus** the **Generator** will:

(iii) ~~submit to~~ **NET** a **Notification of User's Intention to Disconnect**.

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ECP.66.2B ~~PRELIMINARY~~ **OPERATIONAL NOTIFICATION (Type B and Type C)**

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ECP.6.2.1B The following provisions apply ~~in relation to the issue of a Preliminary Operational Notification~~ in respect of a **Power Station** consisting of **Type B** and(or) **Type C Power Generating Modules**.

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ECP.66.2.2B Not less than 28 days, or such shorter period as may be acceptable in **NET's** reasonable opinion, prior to the **Generator** wishing to **Synchronise** its **Plant** and **Apparatus** or dynamically controlled **OTSUA** for the first time the **Generator** or **HVDC Equipment** owner will:

~~(iv)~~(iii) submit to **NET** a **Notification of User's Intention to Synchronise**; and

~~(v)~~(iv) submit to **NGET** an initial **Power Generating Module Document** containing at least but not limited to the items referred to at ECP.66.2.3B.

ECP.66.2.3B Items for submission prior to issue of the **Preliminary Operational Notification**.

ECP.66.2.3.1B ~~Prior to the issue of a Preliminary Operational Notification~~ in respect of the **UserEU Code User's Plant** and **Apparatus** or dynamically controlled **OTSUA** the **Generator** must submit to **NGET** to **NGET's** satisfaction a **preliminary Power Generating Module Document** containing at least but not limited to:

- (i) 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**;
- (ii) for **Type C Power Generating Modules** the simulation models;
- (iii) details of any special **Power Generating Module(s)** protection ~~as required by ECC.6.2.2.3 as applicable~~. This may include Pole Slipping protection and islanding protection schemes as applicable;
- (iv) simulation study provisions of Appendix ECP.A.3 and the results demonstrating compliance with **Grid Code** requirements of:

PC.A.5.4.2  
PC.A.5.4.3.2,  
ECC.6.3.4,  
ECC.6.3.7.3.1 to ECC.6.3.7.3.6,  
ECC.6.3.15, ECC.6.3.16  
ECC.A.6.2.5.6  
ECC.A.7.2.3.1

as applicable to the **Power Generating Module(s)** or dynamically controlled **OTSUA** unless agreed otherwise by **NGET**;

- (v) a detailed schedule of the tests and the procedures for the tests required to be carried out by the **Generator** under ECP.7.2 to demonstrate compliance with relevant **Grid Code** requirements. Such schedule to be consistent with Appendix ECP.A.5 (in the case of a **Synchronous Power Generating Module**) or Appendix ECP.A.6 (in the case of a **Power Park Modules**) and **OTSUA** as applicable);
- (vi) copies of **Manufacturer's Test Certificates** or **Equipment Certificates** issued by an **Authorised Certifier** or

equivalent as agreed with **NGET** where these are relied upon as part of the evidence of compliance and

- (vii) a **Compliance Statement** and a **User Self Certification of Compliance** completed by the **UserEU Code User** (including any **Unresolved Issues**) against the relevant **Grid Code** requirements including details of any requirements that the **Generator** has identified that will not or may not be met or demonstrated.

ECP.66.2.3.2B The items referred to in ECP.66.2.3B shall be submitted by the **Generator** in the form of a **Power Generating Module Document (PGMD)** for each applicable **Power Generating Module**.

ECP.66.2.4B No **Generating Unit** or dynamically controlled **OTSUA** shall be **Synchronised** to the **Total System** (and for the avoidance of doubt, dynamically controlled **OTSUA** will not be able to transmit)- until the later of:

- (a) the date specified by **NGET** in the **Preliminary/Final Operational Notification** issued in respect of each applicable **Power Generating Module(s)** or dynamically controlled **OTSUA**; and,

- (b) in the case of **Synchronous Power Generating Module(s)** only after the date of receipt by the **Generator** of written confirmation from **NGET** that the **Synchronous Power Generating Module** or **CCGT Module** as applicable has completed the following tests to demonstrate compliance with the relevant provisions of the **Connection Conditions** to **NGET's** satisfaction:

- (i) those tests required to establish the open and short circuit saturation characteristics of the **Synchronous Power Generating Module** (as detailed in Appendix ECP.A.4.3) to enable assessment of the short circuit ratio in accordance with ECC.6.3.2. Such tests may be carried out at a location other than the **Power Station** site and supplied in the form of an **Equipment Certificate** or as otherwise agreed by **NGET**; and

- (ii) open circuit step response tests (as detailed in Appendix ECP.A.5.2) to demonstrate compliance with ECC.A.6.2.4.1.

ECP.66.2.5B **NGET** shall assess the schedule of tests submitted by the **Generator** with the **Notification of User's Intention to Synchronise** under ECP.66.2.3B and shall determine whether such schedule has been completed to **NGET's** satisfaction.

ECP.66.2.6B When the requirements of ECP.66.2.2B to ECP.66.2.5B have been met, **NGET** will notify the **Generator** that the:

**Synchronous Power Generating Module,**  
**CCGT Module,**  
**Power Park Module** or  
Dynamically controlled **OTSUA**

as applicable may (subject to the **Generator** having fulfilled the requirements of ECP.66.2.3B where that applies) be **Synchronised** to the **Total System** through the issue of an **Preliminary Operational Notification**. Where the **Generator** is undertaking OTSDUW then the **Preliminary Operational Notification** will be in two parts, with the "**Preliminary Interim Operational Notification Part A**" applicable to OTSUA and the **Preliminary Final Operational Notification Part B**" applicable to the **UserEU Code Users Plant and Apparatus**. For the avoidance of doubt, the "**Preliminary Interim Operational Notification Part A**" and the "**Preliminary Final Operational Notification Part B**" can be issued together or at different times. In respect of an **Embedded Power Station or Embedded HVDC Equipment Station** (other than a **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** and **Embedded HVDC Equipment Stations** not subject to a **Bilateral Agreement**), NGET will notify the **Network Operator** that an **Preliminary Operational Notification**s ~~has~~ been issued.

~~ECP.6.2.7 Where a **Generator** has submitted a **Power Generation Module Document** which in **NGET's** reasonable opinion is complete and adequate **NGET** will issue a **Final Operational Notification** following the process set out in ECP7..~~

~~ECP.6.2.8 Where a **Generator** has submitted a **Power Generation Module Document** which in **NGET's** reasonable opinion is not complete and/or adequate the **Generator** may opt to follow the process set out in ECP.6.3 in order to permit the operation of the **Power Generation Module** while **Unresolved Issues** are addressed.~~

~~ECP.6.6.1B The **Preliminary Operational Notification** will be time limited, the expiration date being specified at the time of issue. The **Preliminary Operational Notification** may be renewed by **NGET**.~~

~~ECP.6.6.2B The **Generator** must operate the **Power Generating Module** or **OTSUA** in accordance with the terms, arising from the **Unresolved Issues**, of the **Preliminary Operational Notification**. Where practicable, **NGET** will discuss such terms with the **Generator** prior to including them in the **Preliminary Operational Notification**.~~

~~ECP.6.6.3B The **Preliminary Operational Notification** will include the following limitations:~~

~~(a) In the case of **OTSUA**, the **Preliminary Operational Notification Part A** permits **Synchronisation** of the dynamically controlled **OTSUA** to the **Total System** only for the purposes of active control of voltage and reactive power and not for the purpose of exporting **Active Power**.~~

~~(b) In the case of a **Power Park Module** the **Preliminary Operational Notification** (and where **OTSDUW Arrangements** apply, this reference will be to the **Interim Operational Notification Part B**) will limit the proportion of the **Power Park Module** which can be simultaneously **Synchronised** to the **Total System** such that neither of the following figures is exceeded:~~

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~~(i) 20% of the **Maximum Capacity** of the **Power Park Module** (or the output of a single **Power Park Unit** where this exceeds 20% of the **Power Station's Maximum Capacity**)~~

~~until the **Generator** has completed the voltage control tests (detailed in ECP.A.6.2) (including in respect of any dynamically controlled **OTSUA**) to **NGET's** reasonable satisfaction. Following successful completion of this test each additional **Power Park Unit** should be included in the voltage control scheme as soon as is technically possible (unless **NGET** agrees otherwise).~~

~~(c) not applicable~~

~~(d) In the case of a **Synchronous Power Generating Module** employing a static **Excitation System** the **Preliminary Operational Notification** (and where **OTSDUW Arrangements** apply, this reference will be to the **Interim Operational Notification Part B**) may, if applicable, limit the maximum **Active Power** output and **Reactive Power** output of the **Synchronous Power Generating Module** or **CCGT module** prior to the successful commissioning of the **Power System Stabiliser** to **NGET's** satisfaction, if applicable.~~

~~ECP.6.6.4B Operation in accordance with the **Preliminary Operational Notification** whilst it is in force will meet the requirements for compliance by the **Generator** and **NGET** of all the relevant provisions of the **European Connection Conditions**.~~

~~ECP.6.7B Other than **Unresolved Issues** that are subject to tests required under ECP.7.2 to be witnessed by **NGET**, the **Generator** must resolve any **Unresolved Issues** prior to the commencement of the tests, unless **NGET** agrees to a later resolution. The **Generator** must liaise with **NGET** in respect of such resolution. The tests that may be witnessed by **NGET** are specified in ECP.7.2.~~

~~ECP.6.8B Not less than 28 days, or such shorter period as may be acceptable in **NGET's** reasonable opinion, prior to the **Generator** wishing to commence tests required under ECP.7 to be witnessed by **NGET**, the **Generator** will notify **NGET** that the **Power Generating Module(s)** as applicable is ready to commence such tests.~~

~~ECP.6.9B The items referred to at ECP.7.3 shall be submitted by the **Generator** after successful completion of the tests required under ECP.7.2.~~

~~ECP.66.3 INTERIM OPERATIONAL NOTIFICATION (Type D and HVDC Equipment)~~

~~ECP.66.3.1 The following provisions apply in relation to the issue of an **Interim Operational Notification** in respect of a **Power Station** consisting of **Type D Power Generating Modules** or an **HVDC System**.~~

~~ECP.66.3.2 Not less than 28 days, or such shorter period as may be acceptable in **NGET's** reasonable opinion, prior to the **Generator** or **HVDC System Owner** wishing to **Synchronise** its **Plant** and **Apparatus** or **dynamically controlled OTSUA** for the first time the **Generator** or **HVDC System Owner** will:~~

- ~~i. submit to **NGET** a **Notification of User's Intention to Synchronise**; and~~

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ii. submit to **NGET** the items referred to at ECP.66.3.3.

ECP.66.3.3 Items for submission prior to issue of the **Interim Operational Notification**.

ECP.66.3.3.1 Prior to the issue of an **Interim Operational Notification** in respect of the **UserEU Code User's Plant and Apparatus** or dynamically controlled **OTSUA the Generator or HVDC System Owner** must submit to **NGET** to **NGET's** satisfaction:

- (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**;
- (b) details of any special **Power Generating Module(s)** or **HVDC Equipment** protection as applicable. This may include Pole Slipping protection and islanding protection schemes;
- (c) any items required by ECP.5.2, updated by the **UserEU Code User** as necessary;
- (d) simulation study provisions of Appendix ECP.A.3 and the results demonstrating compliance with **Grid Code** requirements of:

PC.A.5.4.2  
PC.A.5.4.3.2,  
ECC.6.3.4,  
ECC.6.3.7.3.1 to ECC.6.3.7.3.6,  
ECC.6.3.15, **ECC.6.3.16**  
ECC.A.6.2.5.6  
ECC.A.7.2.3.1

as applicable to the **Power Station, Synchronous Power Generating Module(s), Power Park Module(s), HVDC Equipment** or dynamically controlled **OTSUA** unless agreed otherwise by **NGET**;

- (e) a detailed schedule of the tests and the procedures for the tests required to be carried out by the **Generator** or **HVDC System Owner** under ECP.7.2 to demonstrate compliance with relevant **Grid Code** requirements. Such schedule to be consistent with Appendix ECP.A.5 (in the case of **Synchronous Power Generating Modules**) or Appendix ECP.A.6 (in the case of **Power Park Modules** and **OTSUA** as applicable) or Appendix ECP.A.7 (in the case of **HVDC Equipment**); and
- (f) an interim **Compliance Statement** and a **User Self Certification of Compliance** completed by the **UserEU Code User** (including any **Unresolved Issues**) against the

relevant **Grid Code** requirements including details of any requirements that the **Generator** or **HVDC System Owner** has identified that will not or may not be met or demonstrated.

- | ECP.66.3.3.2 The items referred to in ECP.66.3.3 shall be submitted by the **Generator** or **HVDC System Owner** using the **User Data File Structure**.
  
- | ECP.66.3.4 No **Power Generating Module** or **HVDC Equipment** shall be **Synchronised** to the **Total System** (and for the avoidance of doubt, dynamically controlled **OTSUA** will not be able to transmit) until the later of:
  - (a) the date specified by **NGET** in the **Interim Operational Notification** issued in respect of the **Power Generating Module(s)** or **HVDC Equipment** or dynamically controlled **OTSUA**; and,
  - (b) if **Embedded**, the date of receipt of a confirmation from the **Network Operator** in whose **System** the **Plant and Apparatus** is connected that it is acceptable to the **Network Operator** that the **Plant and Apparatus** be connected and **Synchronised**; and,
  - (c) in the case of **Synchronous Power Generating Module(s)** only after the date of receipt by **Generator** of written confirmation from **NGET** that the **Synchronous Power Generating Module** ~~or **CCGT Module** as applicable~~ has completed the following tests to demonstrate compliance with the relevant provisions of the **Connection Conditions** to **NGET's** satisfaction:
    - (i) those tests required to establish the open and short circuit saturation characteristics of the **Synchronous Power Generating Module** (as detailed in Appendix ECP.A.5.3) to enable assessment of the short circuit ratio in accordance with ECC.6.3.2. Such tests may be carried out at a location other than the **Power Station** site; and
    - (ii) open circuit step response tests (as detailed in Appendix ECP.A.5.2) to demonstrate compliance with ECC.A.6.2.4.1.
  
- | ECP.66.3.5 **NGET** shall assess the schedule of tests submitted by the **Generator** or **HVDC System Owner** with the **Notification of User's Intention to Synchronise** under ECP.66.3.1 and shall determine whether such schedule has been completed to **NGET's** satisfaction.
  
- | ECP.66.3.6 When the requirements of ECP.66.3.2 to ECP.66.3.5 have been met, **NGET** will notify the **Generator** or **HVDC System Owner** that the:  
**Synchronous Power Generating Module,**  
**CCGT Module,**  
**Power Park Module**  
Dynamically controlled **OTSUA** or

### **HVDC Equipment,**

as applicable may (subject to the **Generator** or **HVDC System Owner** having fulfilled the requirements of ECP.66.3.3 where that applies) be **Synchronised** to the **Total System** through the issue of an **Interim Operational Notification**. Where the **Generator** is undertaking **OTSDUW** then the **Interim Operational Notification** will be in two parts, with the “**Interim Operational Notification Part A**” applicable to **OTSUA** and the “**Interim Operational Notification Part B**” applicable to the **UserEU Code Users Plant and Apparatus**. For the avoidance of doubt, the “**Interim Operational Notification Part A**” and the “**Interim Operational Notification Part B**” can be issued together or at different times. In respect of an **Embedded Power Station or Embedded HVDC Equipment Station** (other than a **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** and **Embedded HVDC Equipment Stations** not subject to a **Bilateral Agreement**), **NGET** will notify the **Network Operator** that an **Interim Operational Notification** has been issued.

ECP.66.3.6.1 The **Interim Operational Notification** will be time limited, the expiration date being specified at the time of issue. The **Interim Operational Notification** may be renewed by **NGET** for up to a maximum of 24 months from the date of the first issue of the **Interim Operational Notification**. **NGET** may only issue an extension to an **Interim Operational Notification** beyond 24 months provided the **Generator** or **HVDC System Owner** has applied for a derogation for any remaining **Unresolved Issues** to the **Authority** as detailed in ECP.9.

ECP.66.3.6.2 The **Generator** or **HVDC System Owner** must operate the **Power Generating Module or HVDC Equipment** in accordance with the terms, arising from the **Unresolved Issues**, of the **Interim Operational Notification**. Where practicable, **NGET** will discuss such terms with the **Generator** or **HVDC System Owner** prior to including them in the **Interim Operational Notification**.

ECP.66.3.6.3 The **Interim Operational Notification** will include the following limitations:

(a) In the case of **OTSUA**, the **Interim Operational Notification Part A** permits **Synchronisation** of the dynamically controlled **OTSUA** to the **Total System** only for the purposes of active control of voltage and reactive power and not for the purpose of exporting **Active Power**.

(b) In the case of a **Power Park Module** the **Interim Operational Notification** (and where **OTSDUW** Arrangements apply, this reference will be to the **Interim Operational Notification Part B**) will limit the proportion of the **Power Park Module** which can be simultaneously **Synchronised** to the **Total System** such that neither of the following figures is exceeded:

(i) 20% of the **Maximum Capacity** of the **Power Park Module** (or the output of a single **Power Park Unit**

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where this exceeds 20% of the **Power Station's Maximum Capacity**); nor

(ii) 50MW

until the **Generator** has completed the voltage control tests (detailed in ECP.A.66.3.2) to **NGET's** reasonable satisfaction. Following successful completion of this test each additional **Power Park Unit** should be included in the voltage control scheme as soon as is technically possible (unless **NGET** agrees otherwise).

(c) In the case of a **Power Park Module** with a **Maximum Capacity** greater or equal to 100MW, the **Interim Operational Notification** (and where **OTSDUW** Arrangements apply, this reference will be to the **Interim Operational Notification Part B**) will limit the proportion of the **Power Park Module** which can be simultaneously **Synchronised** to the **Total System** to 70% of **Maximum Capacity** until the **Generator** has completed the **Limited Frequency Sensitive Mode (LFSM-O)** control tests with at least 50% of the **Maximum Capacity** of the **Power Park Module** in service ( detailed in ECP.A.66.3.3) to **NGET's** reasonable satisfaction.

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(d) In the case of a **Synchronous Power Generating Module** employing a static **Excitation System** or a **Power Park Module** employing a **Power System Stabiliser** the **Interim Operational Notification** (and where **OTSDUW** Arrangements apply, this reference will be to the Interim Operational Notification Part B) may if applicable limit the maximum **Active Power** output and **Reactive Power** output of the **Synchronous Power Generating Module** or **CCGT module** prior to the successful commissioning of the **Power System Stabiliser** to **NGET's** satisfaction.

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ECP.66.3.6.4 Operation in accordance with the **Interim Operational Notification** whilst it is in force will meet the requirements for compliance by the **Generator** or **HVDC System Owner** and **NGET** of all the relevant provisions of the **European Connection Conditions**.

ECP.66.3.7 Other than **Unresolved Issues** that are subject to tests required under ECP.7.2 to be witnessed by **NGET**, the **Generator** or **HVDC System Owner** must resolve any **Unresolved Issues** prior to the commencement of the tests, unless **NGET** agrees to a later resolution. The **Generator** or **HVDC System Owner** must liaise with **NGET** in respect of such resolution. The tests that may be witnessed by **NGET** are specified in ECP.7.2.

ECP.66.3.8 Not less than 28 days, or such shorter period as may be acceptable in **NGET's** reasonable opinion, prior to the **Generator** or **HVDC System Owner** wishing to commence tests required under ECP.7 to be witnessed by **NGET**, the **Generator** or **HVDC System Owner** will notify **NGET** that the **Power Generating Module(s)** or **HVDC Equipment(s)** as applicable is ready to commence such tests.

ECP.66.3.9 The items referred to at ECP.7.3 shall be submitted by the **Generator** or the **HVDC System Owner** after successful completion of the tests required under ECP.7.2.

ECP.7. FINAL OPERATIONAL NOTIFICATION

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ECP.7.1 The following provisions apply in relation to the issue of a **Final Operational Notification** in respect of a **Power Station** consisting of **Type B, Type C** and **Type D Power Generating Modules** or an **HVDC System**.

ECP.7.2 Tests to be carried out prior to issue of the **Final Operational Notification**.

ECP.7.2.1 Prior to the issue of a **Final Operational Notification** the **Generator** or **HVDC System Owner** must have completed the tests specified in this ECP.7.2.2 to **NGET's** satisfaction to demonstrate compliance with the relevant **Grid Code** provisions.

ECP.7.2.2 In the case of any **Power Generating Module, OTSUA** (if applicable) or **HVDC Equipment** these tests will reflect the relevant technical requirements and will comprise one or more of the following:

- (a) Reactive capability tests to demonstrate that the **Power Generating Module, OTSUA** (if applicable) or **HVDC Equipment** can meet the requirements of ECC.6.3.2. These may be witnessed by **NGET** on site if there is no metering to the **NGET** Control Centre.
- (b) voltage control system tests to demonstrate that the **Power Generating Module, OTSUA** (if applicable) or **HVDC Equipment** can meet the requirements of ECC.6.3.6.3, ECC.6.3.8 and, in the case of **Power Park Module, OTSUA** (if applicable) and **HVDC Equipment**, the requirements of ECC.A.7 or ECC.A.8 and, in the case of **Synchronous Power Generating Module** and **CCGT Module**, the requirements of ECC.A.6, and any terms specified in the **Bilateral Agreement** as applicable. These tests may also be used to validate the **Excitation System** model (PC.A.5.3) or voltage control system model (PC.A.5.4) as applicable. These tests may be witnessed by **NGET**.
- (c) governor or frequency control system tests to demonstrate that the **Power Generating Module, OTSUA** (if applicable) or **HVDC Equipment** can meet the requirements of ECC.6.3.6.2, ECC.6.3.7, where applicable ECC.A.3, and BC.3.7. In the case of a **Type B Power Generating Module** only tests BC3 and BC4 in ECP.A.5.8 Figure 2 or ECP.A.6.6 Figure 2 must be completed. The results will also validate the **Mandatory Service Agreement** required by ECC.8.1. These tests may also be used to validate the **gGovernor** model (PC.A.5.3) or frequency control system model (PC.A.5.4) as applicable. These tests may be witnessed by **NGET**.

- (d) fault ride through tests in respect of a **Power Station** with a **Maximum Capacity** of 100MW or greater, comprised of one or more **Power Park Modules**, to demonstrate compliance with ECC.6.3.15, ECC.6.3.16 and ECC.A.4. Where test results from a **Manufacturers Data & Performance Report** as defined in ECP.10 have been accepted this test will not be required.
- (e) any further tests reasonably required by **NGET** and agreed with the UserEU Code User to demonstrate any aspects of compliance with the **Grid Code** and the **CUSC Contracts**.

ECP.7.2.3 **NGET's** preferred range of tests to demonstrate compliance with the **ECCs** are specified in Appendix ECP.A.5 (in the case of **Synchronous Power Generating Modules**) or Appendix ECP.A.6 (in the case of a **Power Park Modules** or **OTSUA** (if applicable)) or Appendix ECP.A.7 (in the case of **HVDC Equipment** and are to be carried out by the UserEU Code User with the results of each test provided to **NGET**. The UserEU Code User may carry out an alternative range of tests if this is agreed with **NGET**. **NGET** may agree a reduced set of tests where there is a relevant **Manufacturers Data & Performance Report** as detailed in ECP.10 or an applicable **Equipment Certificate** has been accepted.

ECP.7.2.4 In the case of **Offshore Power Park Modules** which do not contribute to **Offshore Transmission Licensee Reactive Power** capability as described in ECC.6.3.2.5 or ECC.6.3.2.6 or Voltage Control as described in ECC.6.3.8.5 the tests outlined in ECP.7.2.2 (a) and ECP.7.2.2 (b) are not required. However, the offshore **Reactive Power** transfer tests outlined in ECP.A.5.8 shall be completed in their place.

ECP.7.2.5 Following completion of each of the tests specified in this ECP.7.2, **NGET** will notify the **Generator** or **HVDC System Owner** whether, in the opinion of **NGET**, the results demonstrate compliance with the relevant **Grid Code** conditions.

ECP.7.2.6 The **Generator** or **HVDC System Owner** is responsible for carrying out the tests and retains the responsibility for safety and personnel during the test.

ECP.7.3 Items for submission prior to issue of the **Final Operational Notification**

ECP.7.3.1 Prior to the issue of a **Final Operational Notification** the **Generator** or **HVDC System Owner** must submit to **NGET** to **NGET's** satisfaction:

- (a) updated **Planning Code** data (both **Standard Planning Data** and **Detailed Planning Data**), with validated actual values and updated estimates for the future including **Forecast Data** items such as **Demand**;

- (b) any items required by ECP.5.2 and ECP.6.2.3 or ECP.6.3.3B as applicable, updated by the UserEU Code User as necessary;
- (c) evidence to **NGET's** satisfaction that demonstrates that the controller models and/or parameters (as required under PC.A.5.3.2(c) option 2, PC.A.5.3.2(d) option 2, PC.A.5.4.2, and/or PC.A.5.4.3.2) supplied to **NGET** provide a reasonable representation of the behaviour of the UserEU Code User's **Plant and Apparatus** and **OTSUA** if applicable;
- (d) copies of **Manufacturer's Test Certificates** or **Equipment Certificates** issued by an **Authorised Certifier** or equivalent where these are relied upon as part of the evidence of compliance;
- (e) results from the tests required in accordance with ECP.7.2 carried out by the **Generator** to demonstrate compliance with relevant **Grid Code** requirements including the tests witnessed by **NGET**; and
- (f) the final **Compliance Statement** and a **User Self Certification of Compliance** signed by the UserEU Code User and a statement of any requirements that the **Generator** or **HVDC System Owner** has identified that have not been met together with a copy of the derogation in respect of the same from the **Authority**.

ECP.7.3.2 The items in ECP.7.3 should be submitted by the **Generator** (including in respect of any **OTSUA** if applicable) or **HVDC System Owner** using the **User Data File Structure**.

ECP.7.4 If the requirements of ECP.7.2 and ECP.7.3 have been successfully met, **NGET** will notify the **Generator** or **HVDC System Owner** that compliance with the relevant **Grid Code** provisions has been demonstrated for the **Power Generating Module(s)**, **OTSUA** if applicable or **HVDC Equipment** as applicable through the issue of a **Final Operational Notification**. In respect of a **Embedded Power Station** or **Embedded HVDC Equipment** other than a **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** and **Embedded HVDC Equipment** not subject to a **Bilateral Agreement**, **NGET** will notify the **Network Operator** that a **Final Operational Notification** has been issued.

ECP.7.5 If a **Final Operational Notification** can not be issued because the requirements of ECP.7.2 and ECP.7.3 have not been successfully met prior to the expiry of an ~~Preliminary Operational Notification~~ or ~~an~~ **Interim Operational Notification** then the **Generator** or **HVDC System Owner** (where licensed in respect of its activities) and/or **NGET** shall apply to the **Authority** for a derogation. The provisions of ECP.9 shall then apply.

ECP.8 LIMITED OPERATIONAL NOTIFICATION

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ECP.8.1 Following the issue of a **Final Operational Notification** for a **Power Station** consisting of ~~Type B, Type C or~~ **Type D Power Generating Module** or an **HVDC System** if:

- (i) the **Generator** or **HVDC System Owner** becomes aware, that its **Plant** and/or **Apparatus**<sup>2</sup> (including **OTSUA** if applicable) capability to meet any provisions of the **Grid Code**, or where applicable the **Bilateral Agreement** is not fully available then the **Generator** or **HVDC System Owner** shall follow the process in ECP.8.2 to ECP.8.11; or,
- (ii) a **Network Operator** becomes aware, that the capability of **Plant** and/or **Apparatus**<sup>2</sup> belonging to a **Embedded Power Station** or **Embedded HVDC Equipment Station** (other than a **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** and **Embedded HVDC Equipment Stations** not subject to a **Bilateral Agreement**) is failing to meet any provisions of the **Grid Code**, or where applicable the **Bilateral Agreement** then the **Network Operator** shall inform **NGET** and **NGET** shall inform the **Generator** or **HVDC System Owner** and then follow the process in ECP.8.2 to ECP.8.11; or,
- (iii) **NGET** becomes aware through monitoring as described in OC5.4, that a **Generator** or **HVDC System Owner Plant** and/or **Apparatus**<sup>2</sup> (including **OTSUA** if applicable) capability to meet any provisions of the **Grid Code**, or where applicable the **Bilateral Agreement** is not fully available then **NGET** shall inform the other party. Where **NGET** and the **Generator** or **HVDC System Owner** cannot agree from the monitoring as described in OC5.4 whether the **Plant and/or Apparatus** (including **OTSUA** if applicable) is fully available and/or is compliant with the requirements of the **Grid Code** and where applicable the **Bilateral Agreement**, the parties shall first apply the process in OC5.5.1, before applying the process defined in ECP.8 (**LON**) if applicable. Where the testing instructed in accordance with OC.5.5.1 indicates that the **Plant** and/or **Apparatus** (including **OTSUA** if applicable) is not fully available and/or is not compliant with the requirements of the **Grid Code** and/or the **Bilateral Agreement**, or if the parties so agree, the process in ECP.8.2 to ECP.8.11 shall be followed.

ECP.8.2 Immediately upon a **Generator** or **HVDC System Owner** becoming aware that its **Power Generating Module**, **OTSUA** (if applicable) or **HVDC Equipment** as applicable may be unable to comply with certain provisions of the **Grid Code** or (where applicable) the **Bilateral Agreement**, the **Generator** or **HVDC System Owner** shall notify **NGET** in writing. Additional details of any operating restrictions or changes in applicable data arising from the potential non-compliance and an indication of the date from when the restrictions will be removed and full compliance demonstrated shall be provided as soon as reasonably practical.

ECP.8.3 If the nature of any unavailability and/or potential non-compliance described in ECP.8.1 causes or can reasonably be expected to cause a material adverse effect on the business or condition of **NGET** or other **UserEU Code Users** or the **National Electricity Transmission System** or any **UserEU Code User Systems** then **NGET** may, notwithstanding the provisions of this ECP.8 follow the provisions of Paragraph 5.4 of the **CUSC**.

ECP.8.4 Except where the provisions of ECP.8.3 apply, where the restriction notified in ECP.8.2 is not resolved in 28 days then the **Generator** or **HVDC System Owner** with input from and discussion of conclusions with **NGET**, and the **Network Operator** where the **Synchronous Power Generating Module, CCGT Module, Power Park Module** or **Power Station** as applicable is **Embedded**, shall undertake an investigation to attempt to determine the causes of and solution to the non-compliance. Such investigation shall continue for no longer than 56 days. During such investigation the **Generator** or **HVDC System Owner** shall provide to **NGET** the relevant data which has changed due to the restriction in respect of ECP.7.3.1 as notified to the **Generator** or **HVDC System Owner** by **NGET** as being required to be provided.

ECP.8.5 Issue and Effect of LON

ECP.8.5.1 Following the issue of a **Final Operational Notification**, **NGET** will issue to the **Generator** or **HVDC System Owner** a **Limited Operational Notification** if:

- (a) by the end of the 56 day period referred to at ECP.8.4, the investigation has not resolved the non-compliance to **NGET's** satisfaction; or
- (b) **NGET** is notified by a **Generator** or **HVDC Equipment Systemation Owner** of a **Modification** to its **Plant** and **Apparatus** (including **OTSUA** if applicable); or
- (c) **NGET** receives a submission of data, or a statement from a **Generator** or **HVDC System Owner** indicating a change in **Plant** or **Apparatus** (including **OTSUA** if applicable) or settings (including but not limited to governor and excitation control systems) that may in **NGETs** reasonable opinion, acting in accordance with **Good Industry Practice** be expected to result in a material change of performance.

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In the case of an **Embedded Generator** or **Embedded HVDC System Owner**, **NGET** will issue a copy of the **Limited Operational Notification** to the **Network Operator**.

ECP.8.5.2 The **Limited Operational Notification** will be time limited (in the case of **Type D** or **HVDC Systems** to expire no later than 12 months from the start of the non-compliance or restriction or from reconnection following a change). **NGET** may agree a longer duration in the case of a **Limited Operational Notification** following a **Modification** or whilst the **Authority** is considering the application for a derogation in accordance with ECP.9.1.

- ECP.8.5.3 The **Limited Operational Notification** will notify the **Generator** or **HVDC System Owner** of any restrictions on the operation of the **Synchronous Power Generating Module(s)**, **CCGT Module(s)**, **Power Park Module(s)**, **OTSUA** if applicable or **HVDC Equipment** and will specify the **Unresolved Issues**. The **Generator** or **HVDC System Owner** must operate in accordance with any notified restrictions and must resolve the **Unresolved Issues**.
- ECP.8.5.4 The **User** and **NGET** will be deemed compliant with all the relevant provisions of the **Grid Code** provided operation is in accordance with the **Limited Operational Notification**, whilst it is in force, and that the provisions of and referred to in ECP.8 are complied with.
- ECP.8.5.5 The **Unresolved Issues** included in a **Limited Operational Notification** will show the extent that the provisions of ECP.7.2 (testing) and ECP.7.3 (final data submission) shall apply. In respect of selecting the extent of any tests which may in **NGET's** view reasonably be needed to demonstrate the restored capability and in agreeing the time period in which the tests will be scheduled, **NGET** shall, where reasonably practicable, take account of the **Generator** or **HVDC System Owner's** input to contain its costs associated with the testing.
- ECP.8.5.6 In the case of a change or **Modification** the **Limited Operational Notification** may specify that the affected **Plant** and/or **Apparatus** (including **OTSUA** if applicable) or associated **Synchronous Power Generating Module(s)** or **Power Park Unit(s)** must not be **Synchronised** until all of the following items, that in **NGET's** reasonable opinion are relevant, have been submitted to **NGET** to **NGET's** satisfaction:
- (a) updated **Planning Code** data (both **Standard Planning Data** and **Detailed Planning Data**);
  - (b) details of any relevant special **Power Station**, **Synchronous Power Generating Module(s)**, **Power Park Module(s)**, **OTSUA** (if applicable) or **HVDC Equipment Station(s)** protection as applicable. This may include Pole Slipping protection and islanding protection schemes; and
  - (c) simulation study provisions of Appendix ECP.A.3 and the results demonstrating compliance with **Grid Code** requirements relevant to the change or **Modification** as agreed by **NGET**; and
  - (d) a detailed schedule of the tests and the procedures for the tests required to be carried out by the **Generator** or **HVDC Equipment Station** to demonstrate compliance with relevant **Grid Code** requirements as agreed by **NGET**. The schedule of tests shall be consistent with Appendix ECP.A.5 or Appendix ECP.A.6 as appropriate; and
  - (e) an interim **Compliance Statement** and a **User Self Certification of Compliance** completed by the **User**

(including any **Unresolved Issues**) against the relevant **Grid Code** requirements including details of any requirements that the **Generator** or **HVDC System Owner** has identified that will not or may not be met or demonstrated; and

(f) any other items specified in the **LON**.

ECP.8.5.7 The items referred to in ECP.8.5.6 shall be submitted by the **Generator** (including in respect of any **OTSUA** if applicable) or **HVDC System Owner** using the **User Data File Structure** ~~or **Power Generation Module Document** as applicable.~~

ECP.8.5.8 In the case of **Synchronous Power Generating Module(s)** only, the **Unresolved Issues** of the **LON** may require that the **Generator** must complete the following tests to **NGET's** satisfaction to demonstrate compliance with the relevant provisions of the **CCs** prior to the **Synchronous Power Generating Module** being **Synchronised** to the **Total System**:

- (a) those tests required to establish the open and short circuit saturation characteristics of the **Synchronous Power Generating Module** (as detailed in Appendix ECP.A.5.3) to enable assessment of the short circuit ratio in accordance with ECC.6.3.2.3.4 or ECC.6.3.2.5. Such tests may be carried out at a location other than the **Power Station** site; and
- (b) open circuit step response tests (as detailed in Appendix ECP.A.5.2) to demonstrate compliance with ECC.A.6.2.4.1.

ECP.8.6 In the case of a change or **Modification**, not less than 28 days, or such shorter period as may be acceptable in **NGET's** reasonable opinion, prior to the **Generator** or **HVDC System Owner** wishing to **Synchronise** its **Plant** and **Apparatus** (including **OTSUA** if applicable) for the first time following the change or **Modification**, the **Generator** or **HVDC System Owner** will:

- (i) submit a **Notification of User's Intention to Synchronise**; and
- (ii) submit to **NGET** the items referred to at ECP.8.5.6.

ECP.8.7 Other than **Unresolved Issues** that are subject to tests to be witnessed by **NGET**, the **Generator** or **HVDC System Owner** must resolve any **Unresolved Issues** prior to the commencement of the tests, unless **NGET** agrees to a later resolution. The **Generator** or **HVDC System Owner** must liaise with **NGET** in respect of such resolution. The tests that may be witnessed by **NGET** are specified in ECP.7.2.2.

ECP.8.8 Not less than 28 days, or such shorter period as may be acceptable in **NGET's** reasonable opinion, prior to the **Generator** or **HVDC System Owner** wishing to commence tests listed as **Unresolved Issues** to be witnessed by **NGET**, the **Generator** or **HVDC System Owner** will notify **NGET** that the **Synchronous Power Generating**

**Module(s), CCGT Module(s), Power Park Module(s), OTSUA** if applicable or **HVDC Equipment** as applicable is ready to commence such tests.

ECP.8.9 The items referred to at ECP.7.3 and listed as **Unresolved Issues** shall be submitted by the **Generator** or the **HVDC System Owner** after successful completion of the tests.

ECP.8.10 Where the **Unresolved Issues** have been resolved a **Final Operational Notification** will be issued to the ~~User~~**EU Code User**.

ECP.8.11 If a **Final Operational Notification** has not been issued by **NGET** as referred to at ECP.8.5.2 (or where agreed following a **Modification** by the expiry time of the **LON**) then the **Generator** or **HVDC System Owner** (where licensed in respect of its activities) and **NGET** shall apply to the **Authority** for a derogation.

#### ECP.9 PROCESSES RELATING TO DEROGATIONS

ECP.9.1 Whilst the **Authority** is considering the application for a derogation, the ~~Preliminary Operational Notification, Interim Operational Notification~~ or **Limited Operational Notification** will be extended to remain in force until the **Authority** has notified **NGET** and the **Generator** or **HVDC System Owner** of its decision. Where the **Generator** or **HVDC System Owner** is not licensed **NGET** may propose any necessary changes to the **Bilateral Agreement** with such unlicensed **Generator** or **HVDC System Owner**.

ECP.9.2 If the **Authority**:

- (a) grants a derogation in respect of the **Plant** and/or **Apparatus**, then **NGET** shall issue **Final Operational Notification** once all other **Unresolved Issues** are resolved; or
- (b) decides a derogation is not required in respect of the **Plant** and/or **Apparatus** then **NGET** will reconsider the relevant **Unresolved Issues** and may issue a **Final Operational Notification** once all other **Unresolved Issues** are resolved; or
- (c) decides not to grant any derogation in respect of the **Plant** and/or **Apparatus**, then there will be no **Operational Notification** in place and **NGET** and the ~~User~~**EU Code User** shall consider its rights pursuant to the **CUSC**.

ECP.9.3 Where a ~~Preliminary Operational Notification, Interim Operational Notification~~ or **Limited Operational Notification** is so conditional upon a derogation and such derogation includes any conditions (including any time limit to such derogation) the **Generator** or **HVDC System Owner** will progress the resolution of any **Unresolved Issues** and / or progress and / or comply with any conditions upon such derogation and the provisions of ECP.6.9 to ECP.7.4 shall apply and shall be followed.

#### ECP.10 MANUFACTURER'S DATA & PERFORMANCE REPORT

ECP.10.1.1 Data and performance characteristics in respect of certain **Grid Code** requirements may be registered with **NGET** by **Power Park Unit** manufacturers in respect of specific models of **Power Park Units** by submitting information in the form of a **Manufacturer's Data and Performance Report** to **NGET**.

ECP.10.1.2 A **Generator** planning to construct a new **Power Station** containing the appropriate version of **Power Park Units** in respect of which a **Manufacturer's Data & Performance Report** has been submitted to **NGET** may reference the **Manufacturer's Data & Performance Report** in its submissions to **NGET**. Any **Generator** considering referring to a **Manufacturer's Data & Performance Report** for any aspect of its **Plant** and **Apparatus** may contact **NGET** to discuss the suitability of the relevant **Manufacturer's Data & Performance Report** to its project to determine if, and to what extent, the data included in the **Manufacturer's Data & Performance Report** contributes towards demonstrating compliance with those aspects of the **Grid Code** applicable to the **Generator**. **NGET** will inform the **Generator** if the reference to the **Manufacturer's Data & Performance Report** is not appropriate or not sufficient for its project.

ECP.10.1.3 The process to be followed by **Power Park Unit** manufacturers submitting a **Manufacturer's Data & Performance Report** is agreed by **NGET**. ECP.10.2 indicates the specific **Grid Code** requirement areas in respect of which a **Manufacturer's Data & Performance Report** may be submitted.

ECP.10.1.4 **NGET** will maintain and publish a register of those **Manufacturer's Data & Performance Reports** which **NGET** has received and accepted as being an accurate representation of the performance of the relevant **Plant** and / or **Apparatus**. Such register will identify the manufacturer, the model(s) of **Power Park Unit(s)** to which the report applies and the provisions of the **Grid Code** in respect of which the report contributes towards the demonstration of compliance. The inclusion of any report in the register does not in any way confirm that any **Power Park Modules** which utilise any **Power Park Unit(s)** covered by a report is or will be compliant with the **Grid Code**.

ECP.10.2 A **Manufacturer's Data & Performance Report** in respect of **Power Park Units** may cover one (or part of one) or more of the following provisions of the **Grid Code**:

(a) Fault Ride Through capability ECC.6.3.15, ECC.6.3.16.

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(b) Power Park Module mathematical model PC.A.5.4.2.

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ECP.10.3 Reference to a **Manufacturer's Data & Performance Report** in a UserEU Code User's submissions does not by itself constitute compliance with the **Grid Code**.

ECP.10.4 A **Generator** referencing a **Manufacturer's Data & Performance Report** should insert the relevant **Manufacturer's Data & Performance Report** reference in the appropriate place in the **DRC** data submission, Power Generating Module Document and / or in

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the **User Data File Structure**. **NGET** will consider the suitability of a **Manufacturer's Data & Performance Report**:

- (a) in place of **DRC** data submissions a mathematical model suitable for representation of the entire **Power Park Module** as per ECP.A.3.4.4. For the avoidance of doubt only the relevant sections as specified in PC.A.2.5.5.7 apply. Site specific parameters will still need to be submitted by the **Generator**.
- (b) in place of Fault simulation studies as follows;

**NGET** will not require Fault Ride Through simulation studies to be conducted as per ECP.A.3.5.1 and qualified in ECP.A.3.5.2 provided that;

- (i) Adequate and relevant **Power Park Unit** data is included in respect of Fault Ride Through testing covered in ECP.A.6.7 in the relevant **Manufacturer's Data & Performance Report** , and
  - (ii) For each type and duration of fault as detailed in ECP.A.3.5.1, the expected minimum retained voltage is greater than the corresponding minimum voltage achieved and successfully ridden through in the fault ride through tests covered by the **Manufacturer's Data & Performance Report**.
- (c) to reduce the scope of compliance site tests as follows;
    - (i) Where there is a **Manufacturer's Data & Performance Report** in respect of a **Power Park Unit** which covers Fault Ride Through, **NGET** may agree that no Fault Ride Through testing is required.

ECP.10.5 It is the responsibility of the **User/EU Code User** to ensure that the correct reference for the **Manufacturer's Data & Performance Report** is used and the **User/EU Code User** by using that reference accepts responsibility for the accuracy of the information. The **User/EU Code User** shall ensure that the manufacturer has kept **NGET** informed of any relevant variations in plant specification since the submission of the relevant **Manufacturer's Data & Performance Report** which could impact on the validity of the information.

ECP.10.6 **NGET** may contact the **Power Park Unit** manufacturer directly to verify the relevance of the use of such **Manufacturer's Data & Performance Report**. If **NGET** believe the use some or all of such **Manufacturer's Data & Performance Report** information is incorrect or the referenced data is inappropriate then the reference to the **Manufacturer's Data & Performance Report** may be declared invalid by **NGET**. Where, and to the extent possible, the data included in the **Manufacturer's Data & Performance Report** is appropriate, the compliance assessment process will be continued using the data included in the **Manufacturer's Data & Performance Report**.

APPENDIX 1  
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APPENDIX 2

**USER SELF CERTIFICATION OF COMPLIANCE (Interim/Final)**

<b>Power Station/ HVDC Equipment Station</b>	[Name of Connection Site/site of connection]	<b>User:</b>	[Full User name]	<b>Maximum Capacity (MW) of Plant:</b>	
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This **User Self Certification of Compliance** records the compliance by the **UserEU Code User** in respect of [NAME] **Power Station/HVDC Equipment Station** with the **Grid Code** and the requirements of the **Bilateral Agreement** and **Construction Agreement** dated [ ] with reference number [ ]. It is completed by the **Power Station/HVDC System Owner** in the case of **Plant** and/or **Apparatus** connected to the **National Electricity Transmission System** and for **Embedded Plant**.

We have recorded our compliance against each requirement of the **Grid Code** which applies to the **Power Station/HVDC Equipment Station**, together with references to supporting evidence and a commentary where this is appropriate, and have provided this to **NGET**. A copy of the **Compliance Statement** is attached.

Supporting evidence, in the form of simulation results, test results, manufacturer's data and other documentation, is attached in the **User Data File Structure**.

The **UserEU Code User** hereby certifies that, to the best of its knowledge and acting in accordance with **Good Industry Practice**, the **Power Station** is compliant with the **Grid Code** and the **Bilateral Agreement** in all aspects [with the following **Unresolved Issues\***] [with the following derogation(s)\*\*]:

<b>Connection Condition</b>	<b>Requirement</b>	<b>Ref:</b>	<b>Issue</b>

<b>Compliance certified by:</b>	Name:	Title:
	[PERSON]	[PERSON DESIGNATION]
	Signature:	Of
	[PERSON]	[User details]
	Date:	

\* Include for Interim User Self Certification of Compliance ahead of Interim Operational Notification.  
 \*\* Include for final User Self Certification of Compliance ahead of Final Operational Notification where derogation(s) have been granted. If no derogation(s) required delete wording and Table.

## APPENDIX 3

### SIMULATION STUDIES

#### ECP.A.3.1 SCOPE

- ECP.A.3.1.1 This Appendix sets out the simulation studies required to be submitted to **NGET** to demonstrate compliance with the Connection Conditions unless otherwise agreed with **NGET**. This Appendix should be read in conjunction with ECP.6 with regard to the submission of the reports to **NGET**. Where there is any inconsistency in the technical requirements in respect of which compliance is being demonstrated by simulation in this Appendix and ECC.6.3 and the **Bilateral Agreement**, the provisions of the **Bilateral Agreement** and ECC.6.3 prevail. The studies specified in this Appendix will normally be sufficient to demonstrate compliance. However **NGET** may agree an alternative set of studies proposed by the **Generator** or **HVDC System Owner** provided **NGET** deem the alternative set of studies sufficient to demonstrate compliance with the **Grid Code** and the **Bilateral Agreement**.
- ECP.A.3.1.2 The **Generator** or **HVDC System Owner** shall submit simulation studies in the form of a report to demonstrate compliance. In all cases the simulation studies must utilise models applicable to the **Synchronous Power Generating Module, HVDC Equipment** or **Power Park Module** with proposed or actual parameter settings. Reports should be submitted in English with all diagrams and graphs plotted clearly with legible axes and scaling provided to ensure any variations in plotted values is clear. In all cases the simulation studies must be presented over a sufficient time period to demonstrate compliance with all applicable requirements.
- ECP.A.3.1.3 In the case of an **Offshore Power Station** where **OTSDUW Arrangements** apply simulation studies by the **Generator** should include the action of any relevant **OTSUA** where applicable to demonstrate compliance with the **Grid Code** and the **Bilateral Agreement** at the **Interface Point**.
- ECP.A.3.1.4 **NGET** will permit relaxation from the requirement ECP.A.3.2 to ECP.A.3.8 where an **Equipment Certificate** for the **Power Generating Module** or **HVDC Equipment** has been provided which details the characteristics from appropriate simulations on a representative installation with the same equipment and settings and the performance of the **Power Generating Module** or **HVDC Equipment** can, in **NGET's** opinion, reasonably represent that of the installed **Power Generating Module** or **HVDC Equipment**.
- ECP.A.3.1.5 For **Type B, Type C** and **Type D Power Generating Modules** the relevant **Equipment Certificate** must be supplied in the **Power Generating Module Document** or **Users Data File structure** as applicable. For **HVDC Equipment** the relevant **Equipment Certificates** must be supplied in the **Users Data File structure**.

#### ECP.A.3.2 Power System Stabiliser Tuning

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ECP.A.3.2.1 In the case of a **Synchronous Power Generating Module** with an **Excitation System Power System Stabiliser** the **Power System Stabiliser** tuning simulation study report required by ECC.A.6.2.5.6 or required by the **Bilateral Agreement** shall contain:

- (i) the **Excitation System** model including the **Power System Stabiliser** with settings as required under the **Planning Code** (PC.A.5.3.2(c))
- (ii) open circuit time series simulation study of the response of the **Excitation System** to a +10% step change from 90% to 100% terminal voltage.
- (iii) on load time series dynamic simulation studies of the response of the **Excitation System** with and without the **Power System Stabiliser** to 2% and 10% steps in the reference voltage and a three phase short circuit fault applied to the higher voltage side of the **Synchronous Power Generating Module** transformer for 100ms. The simulation studies should be carried out with the **Synchronous Power Generating Module** operating at full **Active Power** and maximum leading **Reactive Power** import with the fault level at the **Supergrid** HV connection point at minimum or as otherwise agreed with **NGET**. The results should show the **Synchronous Power Generating Module** field voltage, terminal voltage, **Power System Stabiliser** output, **Active Power** and **Reactive Power** output.
- (iv) gain and phase Bode diagrams for the open loop frequency domain response of the **Synchronous Power Generating Module Excitation System** with and without the **Power System Stabiliser**. These should be in a suitable format to allow assessment of the phase contribution of the **Power System Stabiliser** and the gain and phase margin of the **Excitation System** with and without the **Power System Stabiliser** in service.
- (v) an eigenvalue plot to demonstrate that all modes remain stable when the **Power System Stabiliser** gain is increased by at least a factor of 3 from the designed operating value.
- (vi) gain Bode diagram for the closed loop on load frequency domain response of the **Synchronous Power Generating Module Excitation System** with and without the **Power System Stabiliser**. The **Synchronous Power Generating Module** operating at full load and at unity power factor. These diagrams should be in a suitable format to allow comparison of the **Active Power** damping across the frequency range specified in ECC.A.6.2.6.3 with and without the **Power System Stabiliser** in service.

ECP.A.3.2.2 In the case of **Onshore Non-Synchronous Power Generating Module**, **Onshore HVDC Equipment** and **Onshore Power Park Modules** and **OTSDUW Plant** and

**Apparatus** at the **Interface Point** the **Power System Stabiliser** tuning simulation study report required by ECC.A.7.2.4.1 or ECC.A.8.2.4 or required by the **Bilateral Agreement** shall contain:

- (i) the **Voltage Control System** model including the **Power System Stabiliser** with settings as required under the **Planning Code** (PC.A.5.4) and **Bilateral Agreement**.
- (ii) on load time series dynamic simulation studies of the response of the **Voltage Control System** with and without the **Power System Stabiliser** to 2% and 10% steps in the reference voltage and a three phase short circuit fault applied to the **Grid Entry Point** or the **Interface Point** in the case of **OTSDUW Plant** and **Apparatus** for 100ms. The simulation studies should be carried out operating at full **Active Power** and maximum leading **Reactive Power** import condition with the fault level at the **Supergrid** HV connection point at minimum or as otherwise agreed with **NGET**. The results should show appropriate signals to demonstrate the expected damping performance of the **Power System Stabiliser**.
- (iii) any other simulation as specified in the **Bilateral Agreement** or agreed between the **Generator** or **HVDC System Owner** or **Offshore Transmission Licensee** and **NGET**.

ECP.A.3.3 Reactive Capability across the Voltage Range

ECP.A.3.3.1 (a) The **Generator** or ~~HVDC System Owner~~ shall supply simulation studies to demonstrate the capability to meet ECC.6.3.4.1 by submission of a report containing:

- (i) a load flow simulation study result to demonstrate the maximum lagging **Reactive Power** capability of the **Synchronous Power Generating Module**, ~~HVDC Equipment~~, **OTSUA** or **Power Park Module** at **Maximum Capacity** when the **Grid Entry Point** or **User System Entry Point** if **Embedded** or **Interface Point** (in the case of **OTSUA**) voltage is at 105% of nominal.
- (ii) a load flow simulation study result to demonstrate the maximum leading **Reactive Power** capability of the **Synchronous Power Generating Module**, ~~HVDC Equipment~~, **OTSUA** or **Power Park Module** at **Maximum Capacity** when the **Grid Entry Point** or **User System Entry Point** if **Embedded** or **Interface Point** (in the case of **OTSUA**) voltage ~~if Embedded~~ is at 95% of nominal.
- (iii) a load flow simulation study result to demonstrate the maximum lagging **Reactive Power** capability of the **Synchronous Power Generating Module**, ~~HVDC Equipment~~ **OTSUA** or **Power Park Module** at the **Minimum Regulating Level** when the **Grid Entry Point** or **User System Entry Point** if **Embedded** or **Interface Point** (in the case of **OTSUA**) voltage is at 105% of nominal.

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- (iv) a load flow simulation study result to demonstrate the maximum leading **Reactive Power** capability of the **Synchronous Power Generating Module, OTSUA HVDC Equipment** or **Power Park Module** at the **Minimum Regulating Level** when the **Grid Entry Point** or **User System Entry Point** ~~voltage~~ if **Embedded** or **Interface Point** (in the case of **OTSUA**) ~~voltage~~ is at 95% of nominal.

ECP.A.3.3.1 (b) The HVDC System Owner shall supply simulation studies to demonstrate the capability to meet ECC.6.3.4.1 by submission of a report containing:

- (i) a load flow simulation study result to demonstrate the maximum lagging **Reactive Power** capability of the **Synchronous Power Generating Module, HVDC Equipment, OTSUA or Power Park Module** at **Maximum HVDC Active Power Transmission Capacity** when the **Grid Entry Point** or **User System Entry Point** if **Embedded** or **Interface Point** (in case of **OTSUA**) ~~voltage~~ is at 105% of nominal.
- (ii) a load flow simulation study result to demonstrate the maximum leading **Reactive Power** capability of the **Synchronous Power Generating Module, HVDC Equipment, OTSUA or Power Park Module** at **Maximum HVDC Active Power Transmission Capacity** when the **Grid Entry Point** or **User System Entry Point** if **Embedded** or **Interface Point** (in case of **OTSUA**) ~~voltage~~ is at 95% of nominal.
- (iii) a load flow simulation study result to demonstrate the maximum lagging **Reactive Power** capability of the **Synchronous Power Generating Module, HVDC Equipment or Power Park Module** at the **Minimum HVDC Active Power Transmission Capacity** when the **Grid Entry Point** or **User System Entry Point** if **Embedded** or **Interface Point** (in case of **OTSUA**) ~~voltage~~ is at 105% of nominal.
- (iv) a load flow simulation study result to demonstrate the maximum leading **Reactive Power** capability of the **Synchronous Power Generating Module, HVDC Equipment or Power Park Module** at the **Minimum HVDC Active Power Transmission Capacity** when the **Grid Entry Point** or **User System Entry Point** ~~voltage~~ if **Embedded** or **Interface Point** (in case of **OTSUA**) ~~is~~ at 95% of nominal.

ECP.A.3.3.2 In the case of a **Synchronous- Power Generating Module** the terminal voltage in the simulation should be the nominal voltage for the machine.

ECP.A.3.3.3 In the case of a **Power Park Module** where the load flow simulation studies show that the individual **Power Park Units** deviate from nominal voltage to meet the **Reactive Power** requirements then evidence must be provided from factory (e.g. in a **Manufacturer's**

**Data & Performance Report**) or site testing that the **Power Park Unit** is capable of operating continuously at the operating points determined in the load flow simulation studies.

ECP.A.3.4 Voltage Control and Reactive Power Stability

ECP.A.3.4.1 This section applies to **HVDC Equipment**; and **Type C & Type D Power Park Modules** to demonstrate the voltage control capability and **Type B Power Park Modules** to demonstrate the voltage control capability if specified by **NGET**.

In the case of a power station containing **Power Park Modules** and/or **OTSUA** the **Generator** shall provide a report to demonstrate the dynamic capability and control stability of the **Power Park Module**. The report shall contain:

- (i) a dynamic time series simulation study result of a sufficiently large negative step in **System** voltage to cause a change in **Reactive Power** from zero to the maximum lagging value at **Rated MW**.
- (ii) a dynamic time series simulation study result of a sufficiently large positive step in **System** voltage to cause a change in **Reactive Power** from zero to the maximum leading value at **Rated MW**.
- (iii) a dynamic time series simulation study result to demonstrate control stability at the lagging **Reactive Power** limit by application of a -2% voltage step while operating within 5% of the lagging **Reactive Power** limit.
- (iv) a dynamic time series simulation study result to demonstrate control stability at the leading **Reactive Power** limit by application of a +2% voltage step while operating within 5% of the leading **Reactive Power** limit.

ECP.A.3.4.2 All the above studies should be completed with a ~~nominal~~ network operating at the voltage applicable for zero **Reactive Power** transfer at the **Grid Entry Point** or **User System Entry Point** if **Embedded** or, in the case of **OTSUA**, **Interface Point** unless stated otherwise. The ~~and the~~ fault level at the HV connection point should be set at the minimum level as agreed with **NGET**.

ECP.A.3.5 Fault Ride Through and Fast Fault Current Injection

ECP.A.3.5.1 This section applies to **Type B, Type C and Type D Power Generating Modules** and **HVDC Equipment** to demonstrate the modules fault ride through and **Fast Fault Current** injection capability.

The **Generator** or **HVDC System Owner** shall supply time series simulation study results to demonstrate the capability of **Synchronous Power Generating Module, HVDC Equipments, and Power Park Modules** and **OTSUA** to meet ECC.6.3.15 and ECC.6.3.16 by submission of a report containing:

- (i) a time series simulation study of a 140ms three phase short circuit fault with a retained voltage as detailed in table A.3.5.1 below applied at the **Grid Entry Point** or (**User System Entry Point if Embedded**) of the **Power Generating Module** or **HVDC Equipment** or **OTSUA**.
- (ii) a time series simulation study of 140ms unbalanced short circuit faults with a retained voltage as detailed in table ~~A.3.5.4-1~~ on the faulted phase(s) applied at the **Grid Entry Point** or (**User System Entry Point if Embedded**) of the **Power Generating Module** or **HVDC Equipment** or **OTSUA**. The unbalanced faults to be simulated are:
1. a phase to phase fault
  2. a two phase to earth fault
  3. a single phase to earth fault.

<b>Power Generating Module</b>	Retained Voltage
<b>Synchronous Power Generating Module</b>	
Type B	30%
Type C or Type D with Grid connection point voltage <110kV	10%
Type D with connection point voltage >110kV	0%
<b>Power Park Module</b>	
Type B or Type C or Type D with connection point voltage < 110kV	10%
Type D with connection point voltage >110kV	0%
<b>HVDC Equipment</b>	10%

Table A.3.5.1

For a **Power Generating Module** or **HVDC Equipment** or **OTSUA** the simulation study should be completed with the **Power Generating Module** or **HVDC Equipment** or **OTSUA** operating at full **Active Power** and maximum leading **Reactive Power** and the fault level at the **Supergrid** HV connection point at minimum or as otherwise agreed with **NGET** as detailed in ECC.6.3.15.8.

- (iii) time series simulation studies of balanced **Supergrid** voltage dips applied on the nearest point of the **National Electricity Transmission System** operating at **Supergrid** voltage to the **Synchronous Power Generating Module** or **OTSUA**. The simulation studies should include:
1. 50% retained voltage lasting 0.45 seconds
  2. 70% retained voltage lasting 0.81 seconds
  3. 80% retained voltage lasting 1.00 seconds
  4. 85% retained voltage lasting 180 seconds.

For a ~~Type C or Type D~~ **Synchronous Power Generating Module** or **OTSUA**, the simulation study should be completed with the **Synchronous Power Generating Module** or **OTSUA** operating at full **Active Power** and zero **Reactive Power** output and the fault level at

the **Supergrid** HV connection point at minimum or as otherwise agreed with **NGET**. Where the **Synchronous Power Generating Module** is **Embedded** the minimum **Network Operator's System** impedance to the **Supergrid** HV connection point shall be used which may be calculated from the maximum fault level at the **User System Entry Point**.

(iii) time series simulation studies of balanced **Supergrid** voltage dips applied on the nearest point of the **National Electricity Transmission System** operating at **Supergrid** voltage to the **HVDC Equipment** or **Power Park Module**. The simulation studies should include:

1. 30% retained voltage lasting 0.384 seconds
2. 50% retained voltage lasting 0.71 seconds
3. 80% retained voltage lasting 2.5 seconds
4. 85% retained voltage lasting 180 seconds.

For **HVDC Equipment** or **Power Park Modules** the simulation study should be completed with the **HVDC Equipment** or **Power Park Module** operating at full **Active Power** and zero **Reactive Power** output and the fault level at the **Supergrid** HV connection point at minimum or as otherwise agreed with **NGET**. Where the **HVDC Equipment** or **Power Park Module** is **Embedded** the minimum **Network Operator's System** impedance to the **Supergrid** HV connection point shall be used which may be calculated from the maximum fault level at the **User System Entry Point**.

For **HVDC Equipment** the simulations should include the duration of each voltage dip 1 to 4 above for which the **HVDC Equipment** will remain connected.

ECP.A.3.5.2 In the case of **Power Park Modules** comprised of **Power Park Units** in respect of which the **User's** reference to a **Manufacturer's Data & Performance Report** has been accepted by **NGET** for Fault Ride Through, ECP.A.3.5.1 will not apply provided:

(i) the **Generator** or **HVDC System Owner** demonstrates by load flow simulation study result that the faults and voltage dips at either side of the **Power Park Unit** transformer corresponding to the required faults and voltage dips in ECP.A.3.5.1 applied at the nearest point of the **National Electricity Transmission System** operating at **Supergrid** voltage are less than those included in the **Manufacturer's Data & Performance Report**,

or;

(ii) the same or greater percentage faults and voltage dips in ECP.A.3.5.1 have been applied at either side of the **Power Park Unit** transformer in the **Manufacturer's Data & Performance Report**.

ECP.A.3.6 **Limited Frequency Sensitive Mode – Over Frequency (LFSM-O)**

ECP.A.3.6.1 This section applies to **Type B, Type C and Type D Power Generating Modules, HVDC Equipment** to demonstrate the

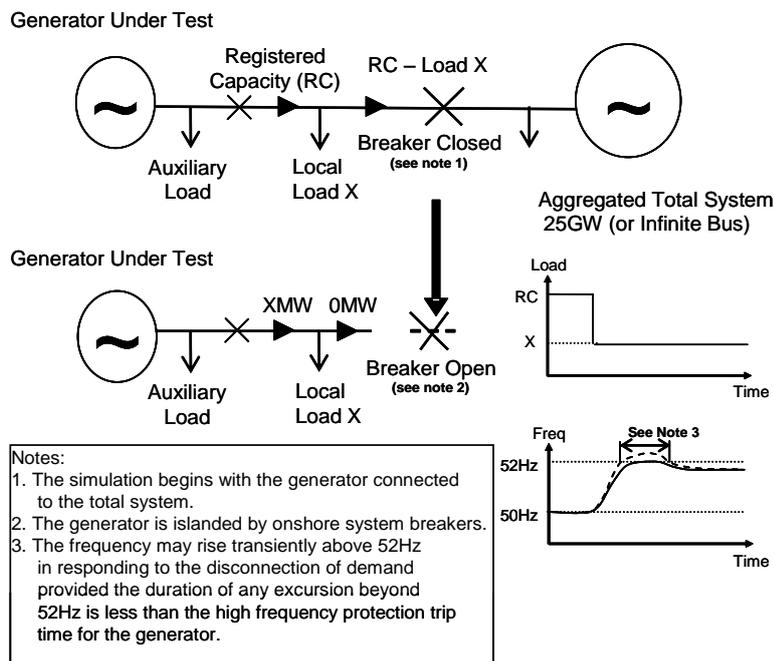
capability to modulate Active Power at high frequency as required by ECC6.3.7.3.5(ii).

ECP.A.3.6.2 The simulation study should comprise of a **Power Generating Module** or **HVDC Equipment** connected to the total **System** with a local load shown as "X" in figure ECP.A.3.6.1. The load "X" is in addition to any auxiliary load of the **Power Station** connected directly to the **Power Generating Module** or **HVDC Equipment** and represents a small portion of the **System** to which the **Power Generating Module** or **HVDC Equipment** is attached. The value of "X" should be the minimum for which the **Power Generating Module** or **HVDC Equipment** can control the power island frequency to less than 52Hz consistent with ECC.6.3.7.3.5(ii). Where transient excursions above 52Hz occur the **Generator** or **HVDC Equipment Owner** should ensure that the duration above 52Hz is less than any high frequency protection system applied to the **Power Generating Module** or **HVDC Equipment**.

ECP.A.3.6.3 For HVDC Equipment and Power Park Modules consisting of units connected wholly by power electronic devices the simulation methodology may be modified by the addition of a **Synchronous Power Generating Module** (G2) connected as indicated in Figure ECP.A.3.6.2. This additional **Synchronous Power Generating Module** should have an inertia constant of 3.5MWs/MVA, be initially operating at rated power output and unity power factor. The mechanical power of the **Synchronous Power Generating Module** (G2) should remain constant throughout the simulation.

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ECP.A.3.6.4 At the start of the simulation study the **Power Generating Module** or **HVDC Equipment** will be operating maximum **Active Power** output. The **Power Generating Module** or **HVDC Equipment** will then be islanded from the **Total System** but still supplying load "X" by the opening of a breaker, which is not the **Power Generating Module** or **HVDC Equipment** connection circuit breaker (the governor should therefore, not receive any signals that the breaker has opened other than the reduction in load and subsequent increase in speed). A schematic arrangement of the simulation study is illustrated by Figure ECP.A.3.6.1.



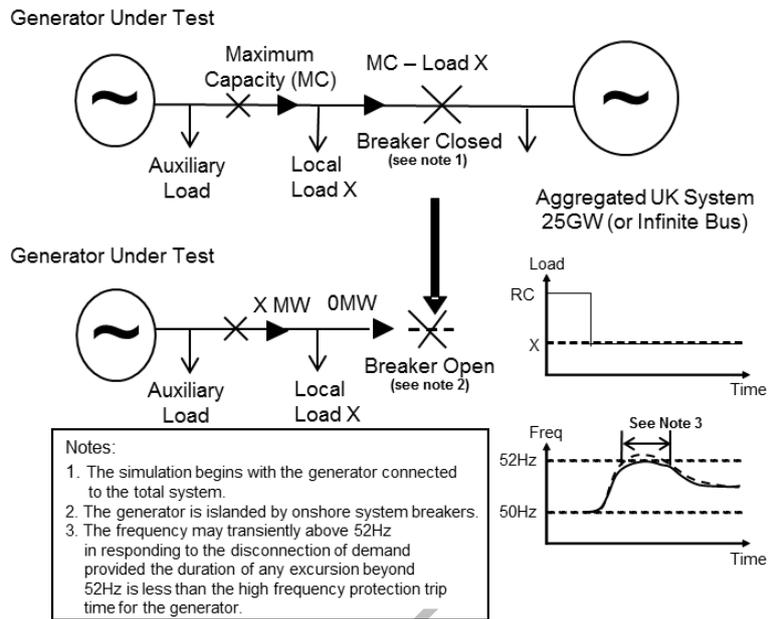


Figure ECP.A.3.6.1 – Diagram of Load Rejection Study

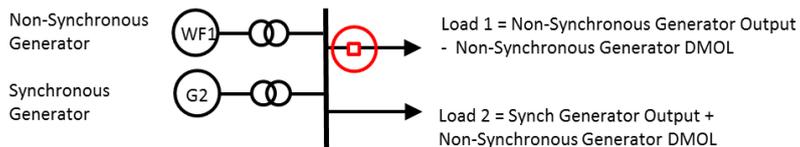


Figure ECP.A.3.6.2 – Addition of Generator G2 if applicable

ECP.A.3.6.5 Simulation study shall be performed for type B, C & D in **Limited Frequency Sensitive Mode (LFSM)** and **Frequency Sensitive Mode (FSM)** for type C & D. The simulation study results should indicate **Active Power** and **Frequency**.

ECP.A.3.6.6 To allow validation of the model used to simulate load rejection in accordance with ECC.6.3.7.3.5 as described a further simulation study is required to represent the largest positive **Frequency** injection step or fast ramp (BC1 and BC3 of Figure 2) that will be applied as a test as described in ECP.A.5.8 and ECP.A.6.6.

**Limited Frequency Sensitive Mode – Under Frequency (LFSM-U)**

ECP.A.3.6.7 This section applies to:  
**Synchronous Power Generating Modules, Type C & D;** or,  
**HVDC Equipment;** or,  
**Power Park Modules, Type C & D** to demonstrate the modules capability to modulate Active Power at low frequency.

ECP.A.3.6.8 To demonstrate the LFSM-U low **Frequency** control when operating in **Limited Frequency Sensitive Mode** the **Generator** or **HVDC System Owner** shall submit a simulation study representing the response of the **Power Generating Module** or **HVDC Equipment** operating at 80% of **Maximum Capacity**. The simulation study event shall be equivalent to:

- (i) a sufficiently large reduction in the measured **System Frequency** ramped over 10 seconds to cause an increase in Active Power output to the **Maximum Capacity** followed by
- (ii) 60 seconds of steady state with the measured **System Frequency** depressed to the same level as in ECP.A.3.6.8.1 (i) as illustrated in Figure ECP.A.3.6.1 below.
- (iii) then increase of the measured **System Frequency** ramped over 10 seconds to cause a reduction in Active Power output back to the original Active Power level followed by at least 60 seconds of steady output.

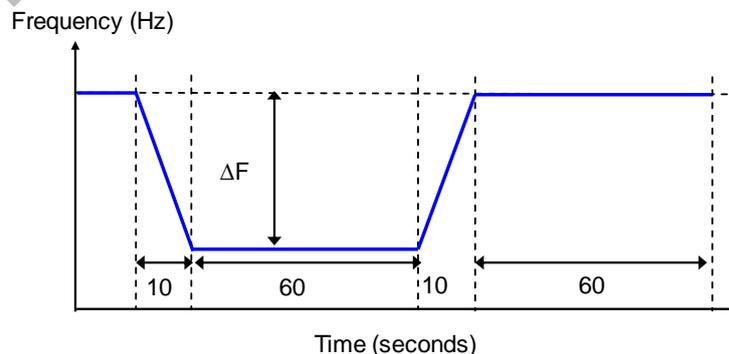


Figure ECP.A.3.6.1

ECP.A.3.7 Voltage and Frequency Controller Model Verification and Validation

ECP.A.3.7.1 For **Type C** and **Type D Synchronous Power Generating Modules, HVDC Equipment or Power Park Modules** the **Generator or HVDC System Owner** shall provide simulation studies to verify that the proposed controller models supplied to **NGET** under the **Planning Code** are fit for purpose. These simulation study results shall be provided in the timescales stated in the **Planning Code**.

ECP.A.3.7.2 To demonstrate the **Frequency** control or governor/load controller/plant model the **Generator or HVDC System Owner** shall submit a simulation study representing the response of the **Synchronous Power Generating Module, HVDC Equipment or Power Park Module** operating at 80% of **Maximum Capacity**. The simulation study event shall be equivalent to:

- (i) a ramped reduction in the measured **System Frequency** of 0.5Hz in 10 seconds followed by
- (ii) 20 seconds of steady state with the measured **System Frequency** depressed by 0.5Hz followed by
- (iii) a ramped increase in measured **System Frequency** of 0.3Hz over 30 seconds followed by
- (iv) 60 seconds of steady state with the measured **System Frequency** depressed by 0.2Hz as illustrated in Figure ECP.A.3.7.2 below.

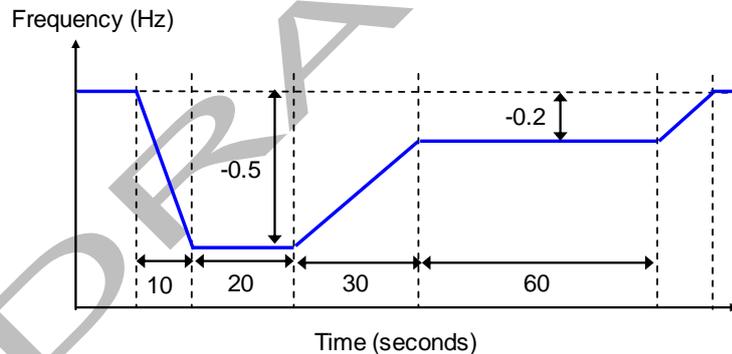


Figure ECP.A.3.7.2

The simulation study shall show **Active Power** output (MW) and the equivalent of **Frequency** injected.

ECP.A.3.7.3 To demonstrate the **Excitation System** model the **Generator** shall submit simulation studies representing the response of the **Synchronous Power Generating Module** as follows:

- (i) operating open circuit at rated terminal voltage and subjected to a 10% step increase in terminal voltage reference from 90% to 100%.
- (ii) operating at **Rated MW**, nominal terminal voltage and unity power factor subjected to a 2% step increase in the voltage reference. Where a **Power System Stabiliser** is included within the **Excitation System** this shall be in service.

The simulation study shall show the **Synchronous Power Generating Module** terminal voltage, field voltage , **Active Power**, **Reactive Power** and **Power System Stabiliser** output signal as appropriate.

- ECP.A.3.7.4 To demonstrate the Voltage Controller model the **Generator** or **HVDC System Owner** shall submit a simulation study representing the response of the **HVDC Equipment** or **Power Park Module** operating at **Rated MW** and unity power factor at the connection point to a 2% step increase in the voltage reference. The simulation study shall show the terminal voltage, **Active Power**, **Reactive Power** and **Power System Stabiliser** output signal as appropriate.
- ECP.A.3.7.5 To validate that the excitation and voltage control models submitted under the **Planning Code** are a reasonable representation of the dynamic behaviour of the **Synchronous Power Generating Module**, **HVDC Equipment** or **Power Park Module** as built, the **Generator** or **HVDC System Owner** shall repeat the simulation studies outlined above but using the operating conditions of the equivalent tests. The simulation study results shall be displayed overlaid on the actual test results.
- ECP.A.3.7.6 For **Type C** and **Type D Synchronous Power Generating Modules** or **HVDC Equipment** to validate that the governor/load controller/plant or **Frequency** control models submitted under the **Planning Code** is a reasonable representation of the dynamic behaviour of the **Synchronous Power Generating Module** or **HVDC Equipment Station** as built, the **Generator** or **HVDC System Owner** shall repeat the simulation studies outlined above but using the operating conditions of the equivalent tests. The simulation study results shall be displayed overlaid on the actual test results.
- ECP.A.3.8 Sub-synchronous Resonance control and Power Oscillation Damping control for **HVDC EquipmentSystem**.
- ECP.A.3.8.1 To demonstrate the compliance of the sub-synchronous control ~~function capability~~ with ECC.6.3.17.1) and the terms of the **Bilateral Agreement** the **HVDC System Owner** shall submit a simulation study report
- ECP.A.3.8.2 Where power oscillation damping control function is specified on a **HVDC Equipment** the **HVDC System Owner** shall submit a simulation study report to demonstrate the compliance with ECC.6.3.17.2 and the terms of the **Bilateral Agreement**.
- ECP.A.3.8.3 The simulation studies should utilise the **HVDC Equipment** control system models including the settings as required under the **Planning Code** (PC.A.5.3.2). The network conditions for the above simulation studies should be discussed with **NGET** prior to commencing any simulation studies.

APPENDIX 4

ONSITE SIGNAL PROVISION FOR WITNESSING TESTS

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ECP.A.4.1 During any tests witnessed on-site by **NGET**, the following signals shall be provided to **NGET** by the **Generator** undertaking **OTSDUW or HVDC System Owner** in accordance with ECC.6.6.3.

ECP.A.4.2 **Synchronous Power Generating Modules**

ECP.A.4.2(a) All Tests	<ul style="list-style-type: none"> <li>• MW - <b>Active Power</b> at <b>Synchronous Generating Unit</b> terminals</li> </ul>
ECP.A.4.2(b) Reactive & Excitation System	<ul style="list-style-type: none"> <li>• MVar - <b>Reactive Power</b> at terminals</li> <li>• Vt - <b>Synchronous Generating Unit</b> terminal voltage</li> <li>• Efd- <b>Synchronous Generating Unit</b> field voltage and/or main exciter field voltage</li> <li>• Ifd – <b>Synchronous Generating Unit</b> Field current (where possible)</li> <li>• <b>Power System Stabiliser</b> output, where applicable.</li> <li>• Noise – Injected noise signal (where applicable and possible)</li> </ul>
ECP.A.4.2(c) Governor System & <b>Frequency Response</b>	<ul style="list-style-type: none"> <li>• Fsys - <b>System Frequency</b></li> <li>• Finj - Injected Speed Setpoint</li> <li>• Logic - Stop / Start Logic Signal</li> </ul> <p>For Gas Turbines:</p> <ul style="list-style-type: none"> <li>• GT Fuel Demand</li> <li>• GT Fuel Valve Position</li> <li>• GT Inlet Guide Vane Position</li> <li>• GT Exhaust Gas Temperature</li> </ul> <p>For Steam Turbines at <math>\geq 1</math>Hz:</p> <ul style="list-style-type: none"> <li>• Pressure before Turbine Governor Valves</li> <li>• Turbine Governor Valve Positions</li> <li>• Governor Oil Pressure*</li> <li>• Boiler Pressure Set Point *</li> <li>• Superheater Outlet Pressure *</li> <li>• Pressure after Turbine Governor Valves*</li> <li>• Boiler Firing Demand*</li> </ul> <p>*Where applicable (typically not in <b>CCGT module</b>)</p> <p>For Hydro Plant:</p> <ul style="list-style-type: none"> <li>• Speed Governor Demand Signal</li> <li>• Actuator Output Signal</li> <li>• Guide Vane / Needle Valve Position</li> </ul>
ECP.A.4.2(d) Compliance with ECC.6.3.3	<ul style="list-style-type: none"> <li>• Fsys - <b>System Frequency</b></li> <li>• Finj - Injected Speed Setpoint</li> <li>• Appropriate control system parameters as agreed with <b>NGET</b> (See ECP.A.5.9)</li> </ul>
ECP.A.4.2(e) Real Time on site	<ul style="list-style-type: none"> <li>• MW - <b>Synchronous Power Generating Module Active Power</b> at the <b>Grid Entry</b></li> </ul>

or Down-loadable	<p><b>Point or (User System Entry Point if Embedded).</b></p> <ul style="list-style-type: none"> <li>• MVA<sub>r</sub> - <b>Synchronous Power Generating Module Reactive Power</b> at the <b>Grid Entry Point or (User System Entry Point if Embedded).</b></li> <li>• Line-line Voltage (kV) at the <b>Grid Entry Point or (User System Entry Point if Embedded).</b></li> </ul>
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#### ECP.A.4.3 Power Park Modules, OTSDUA and HVDC Equipment

	Each <b>Power Park Module</b> and <b>HVDC Equipment</b> at <b>Grid Entry Point</b> or <b>User System Entry Point</b>
ECP.A.4.3.1(a) Real Time on site.	<ul style="list-style-type: none"> <li>• Total <b>Active Power</b> (MW)</li> <li>• Total <b>Reactive Power</b> (MVA<sub>r</sub>)</li> <li>• Line-line Voltage (kV)</li> <li>• <b>System Frequency</b> (Hz)</li> </ul>
ECP.A.4.3.1(b) Real Time on site or Down-loadable	<ul style="list-style-type: none"> <li>• Injected frequency signal (Hz) or test logic signal (Boolean) when appropriate</li> <li>• Injected voltage signal (per unit voltage) or test logic signal (Boolean) when appropriate</li> <li>• In the case of an <b>Onshore Power Park Module</b> the <b>Onshore Power Park Module</b> site voltage (MV) (kV)</li> <li>• <b>Power System Stabiliser</b> output, where appropriate</li> <li>• In the case of a <b>Power Park Module</b> or <b>HVDC Equipment</b> where the <b>Reactive Power</b> is provided by from more than one <b>Reactive Power</b> source, the individual <b>Reactive Power</b> contributions from each source, as agreed with <b>NGET</b>.</li> <li>• In the case of <b>HVDC Equipment</b> appropriate control system parameters as agreed with <b>NGET</b> (See ECP.A.7)</li> <li>• In the case of an <b>Offshore Power Park Module</b> the Total <b>Active Power</b> (MW) and the Total <b>Reactive Power</b> (MVA<sub>r</sub>) at the offshore <b>Grid Entry Point</b></li> </ul>
ECP.A.4.3.1(c) Real Time on site or Down-loadable	<ul style="list-style-type: none"> <li>• Available power for <b>Power Park Module</b> (MW)</li> <li>• Power source speed for <b>Power Park Module</b> (e.g. wind speed) (m/s) when appropriate</li> <li>• Power source direction for <b>Power Park Module</b> (degrees) when appropriate</li> </ul> <p>See ECP.A.4.3.2</p>

ECP.A.4.3.2 **NGET** accept that the signals specified in ECP.A.4.3.1(c) may have lower effective sample rates than those required in ECC.6.6.3 although any signals supplied for connection to **NGET's** recording equipment which do not meet at least the sample rates detailed in

ECC.6.6.3 should have the actual sample rates indicated to **NGET** before testing commences.

ECP.A.4.3.3 For all **NGET** witnessed testing either;

- (i) the **Generator** or **HVDC System Owner** shall provide to **NGET** all signals outlined in ECP.A.4.3.1 direct from the **Power Park Module** control system without any attenuation, delay or filtering which would result in the inability to fully demonstrate the objectives of the test, or identify any potential safety or plant instability issues, and with a signal update rate corresponding to ECC.6.6.3.2; or
- (ii) in the case of **Onshore Power Park Modules** the **Generator HVDC System Owner** shall provide signals ECP.A.4.3.1-(a) direct from one or more transducer(s) connected to current and voltage transformers for monitoring in real time on site; or,
- (iii) In the case of **Offshore Power Park Modules** and **OTSDUA** signals ECP.A.4.3.1(a) will be provided at the **Interface Point** by the **Offshore Transmission Licensee** pursuant to the STC or by the **Generator** when **OTSDUW Arrangements** apply.

ECP.A.4.3.4 Options ECP.A.4.3.3 (ii) and (iii) will only be available on condition that;

- (a) all signals outlined in ECP.A.4.3.1 are recorded and made available to **NGET** by the **Generator** or **HVDC System Owner** from the **Power Park Module** or **OTSDUA** or **HVDC Equipment** control systems as a download once the testing has been completed; and
- (b) the full test results are provided by the **Generator HVDC System Owner** within 2 working days of the test date to **NGET** unless **NGET** agrees otherwise; and
- (c) all data is provided with a sample rate in accordance with ECC.6.6.3.3 unless **NGET** agrees otherwise; and
- (d) in **NGET's** reasonable opinion the solution does not unreasonably add a significant delay between tests or impede the volume of testing which can take place on the day.

ECP.A.4.3.5 In the case of where transducers connected to current and voltage transformers are installed (ECP.A.4. 3.3-(ii) and (iii)), the transducers shall meet the following specification

- (a) The transducer(s) shall be permanently installed to easily allow safe testing at any point in the future, and to avoid a requirement for recalibration of the current transformers and voltage transformers.
- (b) The transducer(s) should be directly connected to the metering quality current transformers and voltage transformers or similar.

- (c) The transducers shall either have a response time no greater than 50ms to reach 90% of output, or no greater than 300ms to reach 99.5%.

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## APPENDIX 5

### COMPLIANCE TESTING OF SYNCHRONOUS POWER GENERATING MODULES

#### ECP.A.5.1 SCOPE

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ECP.A.5.1.1 This Appendix sets out the tests contained therein to demonstrate compliance with the relevant clauses of the European Connection Conditions of the **Grid Code**. This Appendix shall be read in conjunction with the ECP with regard to the submission of the reports to **NGET**.

ECP.A.5.1.2 The tests specified in this Appendix will normally be sufficient to demonstrate compliance however **NGET** may:

- (i) agree an alternative set of tests provided **NGET** deem the alternative set of tests sufficient to demonstrate compliance with the **Grid Code** and **Bilateral Agreement**; and/or
- (ii) require additional or alternative tests if information supplied to **NGET** during the compliance process suggests that the tests in this Appendix will not fully demonstrate compliance with the relevant section of the **Grid Code** or **Bilateral Agreement**.
- (iii) Agree a reduced set of tests for subsequent **Synchronous Power Generating Module** following successful completion of the first **Synchronous Power Generating Module** tests in the case of a **Power Station** comprised of two or more **Synchronous Power Generating Module** which **NGET** reasonably considers to be identical.

If:

- (a) the tests performed pursuant to ECP.A.5.1.2(iii) in respect of subsequent **Synchronous Power Generating Modules** do not replicate the full tests for the first **Synchronous Power Generating Module** , or
- (b) any of the tests performed pursuant to ECP.A.5.1.2(iii) do not fully demonstrate compliance with the relevant aspects of the **Grid Code, Ancillary Services Agreement** and / or **Bilateral Agreement**,

then notwithstanding the provisions above, the full testing requirements set out in this Appendix will be applied.

ECP.A.5.1.3 The **Generator** is responsible for carrying out the tests set out in and in accordance with this Appendix and the **Generator** retains the responsibility for the safety of personnel and plant during the test. **NGET** will witness all of the tests outlined or agreed in relation to this Appendix unless **NGET** decides and notifies the **Generator** otherwise. Reactive Capability tests may be witnessed by **NGET** remotely from the **NGET** control centre. For all on site **NGET** witnessed tests the **Generator** should ensure suitable representatives from the **Generator** and manufacturer (if appropriate) are available on site for the entire

testing period. In all cases the **Generator** shall provide suitable monitoring equipment to record all relevant test signals as outlined below in ECP.A.6.1.5.

ECP.A.5.1.6 The **Generator** shall submit a schedule of tests to **NGET** in accordance with CP.4.3.1.

ECP.A.5.1.7 Prior to the testing of a **Synchronous Power Generating Module** the **Generator** shall complete the **Integral Equipment Test** procedure in accordance with OC.7.5.

ECP.A.5.1.8 Full **Synchronous Power Generating Module** testing as required by CP.7.2 is to be completed as defined in ECP.A.5.2 through to ECP.A.5.9.

ECP.A.5.1.9 **NGET** will permit relaxation from the requirement ECP.A.5.2 to ECP.A.5.9 where an **Equipment Certificate** for the **Synchronous Power Generating Module** has been provided which details the characteristics from tests on a representative machine with the same equipment and settings and the performance of the **Synchronous Power Generating Module** can, in **NGET's** opinion, reasonably represent that of the installed **Synchronous Power Generating Module** at that site. For **Type B, Type C** and **Type D Power Generating Modules** the relevant **Equipment Certificate** must be supplied in the **Power Generating Module Document** or **Users Data File structure** as applicable.

#### ECP.A.5.2 Excitation System Open Circuit Step Response Tests

ECP.A.5.2.1 The open circuit step response of the **Excitation System** will be tested by applying a voltage step change from 90% to 100% of the nominal **Synchronous Power Generating Module** terminal voltage, with the **Synchronous Power Generating Module** on open circuit and at rated speed.

ECP.A.5.2.1 The test shall be carried out prior to synchronisation in accordance with CP.6.4. This is not witnessed by **NGET** unless specifically requested by **NGET**. Where **NGET** is not witnessing the tests, the Generator shall supply the recordings of the following signals to **NGET** in an electronic spreadsheet format:

Vt - **Synchronous Generating Unit** terminal voltage  
Efd - **Synchronous Generating Unit** field voltage or main exciter field voltage  
Ifd- **Synchronous Generating Unit** field current (where possible)  
Step injection signal

ECP.A.5.2.3 Results shall be legible, identifiable by labelling, and shall have appropriate scaling.

#### ECP.A.5.3 Open & Short Circuit Saturation Characteristics

ECP.A.5.3.1 The test shall normally be carried out prior to synchronisation in accordance with ECP.6.2.4 or ECP.6.3.4 **Equipment Certificates** or Manufacturer's Test Certificates may be used where appropriate may

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be used if agreed by NGET.

ECP.A.5.3.2 This is not witnessed by **NGET**. Graphical and tabular representations of the results in an electronic spreadsheet format showing per unit open circuit terminal voltage and short circuit current versus per unit field current shall be submitted to **NGET**.

ECP.A.5.3.3 Results shall be legible, identifiable by labelling, and shall have appropriate scaling.

ECP.A.5.4 **Excitation System On-Load Tests**

ECP.A.5.4.1 The time domain performance of the **Excitation System** shall be tested by application of voltage step changes corresponding to 1% and 2% of the nominal terminal voltage.

ECP.A.5.4.2 Where a **Power System Stabiliser** is present:

- (i) The **PSS** must only be commissioned in accordance with BC2.11.2. When a **PSS** is switched on for the first time as part of on-load commissioning or if parameters have been adjusted the **Generator** should consider reducing the **PSS** output gain by at least 50% and should consider reducing the limits on **PSS** output by at least a factor of 5 to prevent unexpected **PSS** action affecting the stability of the **Synchronous Generating Unit** or the **National Electricity Transmission System**.
- (ii) The time domain performance of the **Excitation System** shall be tested by application of voltage step changes corresponding to 1% and 2% of the nominal terminal voltage, repeating with and without the **PSS** in service.
- (iii) The frequency domain tuning of the **PSS** shall also be demonstrated by injecting a 0.2Hz-3Hz band limited random noise signal into the **Automatic Voltage Regulator** Setpoint with the **Synchronous Generating Unit** operating at points specified by **NGET** (up to rated MVA output).
- (iv) The **PSS** gain margin shall be tested by increasing the **PSS** gain gradually to threefold and observing the **Synchronous Generating Unit** steady state **Active Power** output.
- (v) The interaction of the **PSS** with changes in **Active Power** shall be tested by application of a +0.5Hz frequency injection to the governor while the **Synchronous Generating Unit** is selected to **Frequency Sensitive Mode**.
- (vi) If the **Synchronous Power Generating Module** is of the **Pumped Storage** type then the step tests shall be carried out, with and without the **PSS**, in the pumping mode in addition to the generating mode.
- (vii) Where the **Bilateral Agreement** requires that the **PSS** is in service at a specified loading level additional testing witnessed by **NGET** will be required during the commissioning process

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before the **Synchronous Power Generating Module** may exceed this output level.

- (viii) Where the **Excitation System** includes a **PSS**, the **Generator** shall provide a suitable noise source to facilitate noise injection testing.

ECP.A.5.4.3 The following typical procedure is provided to assist **Generators** in drawing up their own site specific procedures for the **NGET** witnessed **PSS** Tests.

Test	Injection	Notes
	Synchronous Generating Unit running at Maximum Capacity, unity pf, PSS Switched Off	
1	<ul style="list-style-type: none"> <li>• Record steady state for 10 seconds</li> <li>• Inject +1% step to AVR Voltage Setpoint and hold for at least 10 seconds until stabilised</li> <li>• Remove step returning AVR Voltage Setpoint to nominal and hold for at least 10 seconds</li> </ul>	
2	<ul style="list-style-type: none"> <li>• Record steady state for 10 seconds</li> <li>• Inject +2% step to AVR Voltage Setpoint and hold for at least 10 seconds until stabilised</li> <li>• Remove step returning AVR Voltage Setpoint to nominal and hold for at least 10 seconds</li> </ul>	
3	<ul style="list-style-type: none"> <li>• Inject band limited (0.2-3Hz) random noise signal into voltage Setpoint and measure frequency spectrum of Real Power.</li> <li>• Remove noise injection.</li> </ul>	
	• Switch On Power System Stabiliser	
4	<ul style="list-style-type: none"> <li>• Record steady state for 10 seconds</li> <li>• Inject +1% step to AVR Voltage Setpoint and hold for at least 10 seconds until stabilised</li> <li>• Remove step returning AVR Voltage Setpoint to nominal and hold for at least 10 seconds</li> </ul>	
5	<ul style="list-style-type: none"> <li>• Record steady state for 10 seconds</li> <li>• Inject +2% step to AVR Voltage Setpoint and hold for at least 10 seconds until stabilised</li> <li>• Remove step returning AVR Voltage Setpoint to nominal and hold for at least 10 seconds</li> </ul>	
6	<ul style="list-style-type: none"> <li>• Increase PSS gain at 30second intervals. i.e. x1 – x1.5 – x2 – x2.5 – x3</li> <li>• Return PSS gain to initial setting</li> </ul>	
7	<ul style="list-style-type: none"> <li>• Inject band limited (0.2-3Hz) random noise signal into voltage Setpoint and measure frequency spectrum of Real Power.</li> <li>• Remove noise injection.</li> </ul>	
8	<ul style="list-style-type: none"> <li>• Select the governor to FSM</li> <li>• Inject +0.5 Hz step into governor.</li> <li>• Hold until generator MW output is stabilised</li> <li>• Remove step</li> </ul>	

ECP.A.5.5 **Under-excitation Limiter Performance Test**

- ECP.A.5.5.1 Initially the performance of the **Under-excitation Limiter** should be checked by moving the limit line close to the operating point of the **Synchronous Generating Unit** when operating close to unity power factor. The operating point of the **Synchronous Generating Unit** is then stepped into the limit by applying a 2% decrease in **Automatic Voltage Regulator Setpoint** voltage.
- ECP.A.5.5.2 The final performance of the **Under-excitation Limiter** shall be demonstrated by testing its response to a step change corresponding to a 2% decrease in **Automatic Voltage Regulator Setpoint** voltage when the **Synchronous Generating Unit** is operating just off the limit line, at the designed setting as indicated on the **Performance Chart [P-Q Capability Diagram]** submitted to **NGET** under OC2.
- ECP.A.5.5.3 Where possible the **Under-excitation Limiter** should also be tested by operating the tap- changer when the **Synchronous Generating Unit** is operating just off the limit line, as set up.
- ECP.A.5.5.4 The **Under-excitation Limiter** will normally be tested at low active power output ~~(minimum stable operating level)~~ and at maximum **Active Power** output ~~(Maximum Capacity)~~.
- ECP.A.5.5.5 The following typical procedure is provided to assist **Generators** in drawing up their own site specific procedures for the **NGET** witnessed **Under-excitation Limiter** Tests.

Test	Injection	Notes
	<b>Synchronous Generating Unit</b> running at <b>Maximum Capacity</b> and unity power factor. Under-excitation limit temporarily moved close to the operating point of the <b>Synchronous Generating Unit</b> .	
1	<ul style="list-style-type: none"> <li>• PSS on.</li> <li>• Inject -2% voltage step into AVR voltage Setpoint and hold at least for 10 seconds until stabilised</li> <li>• Remove step returning AVR Voltage Setpoint to nominal and hold for at least 10 seconds</li> </ul>	
	Under-excitation limit moved to normal position. <b>Synchronous Generating Unit</b> running at <b>Maximum Capacity</b> and at leading <b>Reactive Power</b> close to Under-excitation limit.	
2	<ul style="list-style-type: none"> <li>• PSS on.</li> <li>• Inject -2% voltage step into AVR voltage Setpoint and hold at least for 10 seconds until stabilised</li> <li>• Remove step returning AVR Voltage Setpoint to nominal and hold for at least 10 seconds</li> </ul>	

ECP.A.5.6 Over-excitation Limiter Performance Test

- ECP.A.5.6.1 The performance of the **Over-excitation Limiter**, where it exists, shall be demonstrated by testing its response to a step increase in the Automatic Voltage Regulator Setpoint voltage that results in operation of the **Over-excitation Limiter**. Prior to application of the step the **Synchronous Generating Unit** shall be generating **Maximum Capacity** and operating within its continuous **Reactive Power** capability. The size of the step will be determined by the minimum

value necessary to operate the **Over-excitation Limiter** and will be agreed by **NGET** and the **Generator**. The resulting operation beyond the **Over-excitation Limit** shall be controlled by the **Over-excitation Limiter** without the operation of any protection that could trip the **Synchronous Power Generating Module**. The step shall be removed immediately on completion of the test.

ECP.A.5.6.2 If the **Over-excitation Limiter** has multiple levels to account for heating effects, an explanation of this functionality will be necessary and if appropriate, a description of how this can be tested.

ECP.A.5.6.3 The following typical procedure is provided to assist **Generators** in drawing up their own site specific procedures for the **NGET** witnessed **Under-excitation Limiter Tests**.

Test	Injection	Notes
	<b>Synchronous Generating Unit</b> running at <b>Maximum Capacity</b> and maximum lagging <b>Reactive Power</b> .	
	Over-excitation Limit temporarily set close to this operating point. <b>PSS</b> on.	
1	<ul style="list-style-type: none"> <li>• Inject positive voltage step into AVR voltage Setpoint and hold</li> <li>• Wait till <b>Over-excitation Limiter</b> operates after sufficient time delay to bring back the excitation back to the limit.</li> <li>• Remove step returning AVR Voltage Setpoint to nominal.</li> </ul>	
	Over-excitation Limit restored to its normal operating value. <b>PSS</b> on.	

ECP.A.5.7 Reactive Capability

ECP.A.5.7.1 The **Reactive Power** capability on each **Synchronous Power Generating Module** will normally be demonstrated by :

- (a) operation of the **Synchronous Power Generating Module** at maximum lagging **Reactive Power** and Maximum Capacity for 1 hour
- (b) operation of the **Synchronous Power Generating Module** at maximum leading **Reactive Power** and Maximum Capacity for 1 hour.
- (c) operation of the **Synchronous Power Generating Module** at maximum lagging **Reactive Power** and ~~---~~ **Minimum Stable Operating Level** for 1 hour
- (d) operation of the **Synchronous Power Generating Module** at maximum leading **Reactive Power** and **Minimum Stable Operating Level** for 1 hour.
- (e) operation of the **Synchronous Power Generating Module** at maximum lagging **Reactive Power** and a power output between **Maximum Capacity** and **Minimum Stable Operating Level**.
- (f) operation of the **Synchronous Power Generating Module** at maximum leading **Reactive Power** and a power output between **Maximum Capacity** and **Minimum Stable Operating Level**.

ECP.A.5.7.2 In the case of an **Embedded Synchronous Power Generating Module** where distribution network considerations restrict the **Synchronous Power Generating Module Reactive Power Output** ~~then the maximum leading and lagging capability will be demonstrated without breaching the host network operators limits~~ **NGET will only require demonstration within the acceptable limits of the Network Operator's System.**

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ECP.A.5.7.3 The test procedure, time and date will be agreed with **NGET** and will be to the instruction of **NGET** control centre and shall be monitored and recorded at both the **NGET** control centre and by the **Generator**.

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ECP.A.5.7.4 Where the **Generator** is recording ~~the voltage and Reactive Power at the Synchronous Power Generating Module terminals and~~ the voltage, **Active Power** and **Reactive Power** at the HV connection point ~~for these tests the voltage, Active Power and Reactive Power at the Synchronous Power Generating Module terminals may also~~ shall be included. The results shall be supplied in an electronic spreadsheet format. ~~Where applicable the Synchronous Power Generating Module transformer tapchanger position should be noted throughout the test period.~~

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ECP.A.5.8 Governor and Load Controller Response Performance

ECP.A.5.8.1 The governor and load controller response performance will be tested by injecting simulated frequency deviations into the governor and load controller systems. Such simulated frequency deviation signals must be injected simultaneously at both speed governor and load controller setpoints. For **CCGT modules**, simultaneous injection into all gas turbines, steam turbine governors and module controllers is required.

ECP.A.5.8.2 Prior to witnessing the governor tests set out in ECP.A.5.8.6, **NGET** requires the **Generator** to conduct the preliminary tests detailed in ECP.A.5.8.4 and send the results to **NGET** for assessment unless agreed otherwise by **NGET**. The results should be supplied in an electronic spreadsheet format. These tests shall be completed at least two weeks prior to the witnessed governor response tests.

ECP.A.5.8.3 Where a **CCGT module** or **Synchronous Power Generating Module** is capable of operating on alternative fuels, tests will be required to demonstrate performance when operating on each fuel. **NGET** may agree a reduction from the tests listed in ECP.A.5.8.6 for demonstrating performance on the alternative fuel. This includes the case where a main fuel is supplemented by bio-fuel.

#### Preliminary Governor Frequency Response Testing

ECP.A.5.8.4 Prior to conducting the full set of tests as per ECP.A.5.8.6, **Generators** are required to conduct a preliminary set of tests below to confirm the frequency injection method is correct and the plant control performance is within expectation. The test numbers refer to Figure 1 below. With the plant running at 80% of full load, the following frequency injections shall be applied.

Test No (Figure1)	Frequency Injection	Notes
8	<ul style="list-style-type: none"> <li>Inject -0.5Hz frequency fall over 10 sec</li> <li>Hold for a further 20 sec</li> <li>At 30 sec from the start of the test, Inject a +0.3Hz frequency rise over 30 sec.</li> <li>Hold until conditions stabilise</li> <li>Remove the injected signal <b>as a ramp over 10 seconds</b></li> </ul>	
13	<ul style="list-style-type: none"> <li>Inject - 0.5Hz frequency fall over 10 sec</li> <li>Hold until conditions stabilise</li> <li>Remove the injected signal <b>as a ramp over 10 seconds</b></li> </ul>	
14	<ul style="list-style-type: none"> <li>Inject +0.5Hz frequency rise over 10 sec</li> <li>Hold until conditions stabilise</li> <li>Remove the injected signal <b>as a ramp over 10 seconds</b></li> </ul>	
H	<ul style="list-style-type: none"> <li>Inject - 0.5Hz frequency fall as a stepchange</li> <li>Hold until conditions stabilise</li> <li>Remove the injected signal <b>as a stepchange</b></li> </ul>	
I	<ul style="list-style-type: none"> <li>Inject +0.5Hz frequency rise as a stepchange</li> <li>Hold until conditions stabilise</li> <li>Remove the injected signal <b>as a stepchange</b></li> </ul>	

ECP.A.5.8.5 The recorded results (e.g. Finj, MW and control signals) should be sampled at a minimum rate of 1 Hz to allow **NGET** to assess the plant performance from the initial transients (seconds) to the final steady state conditions (5-15 minutes depending on the plant design). This is not witnessed by **NGET**. The **Generator** shall supply the recordings including data to **NGET** in an electronic spreadsheet format. Results shall be legible, identifiable by labelling, and shall have appropriate scaling.

Full Frequency Response Testing Schedule Witnessed by **NGET**

ECP.A.5.8.6 The tests are to be conducted at a number of different Module Load Points (MLP). The load points are conducted as shown below unless agreed otherwise by **NGET**.

Module Load Point 6 <b>(Maximum Export Limit)</b>	100% MEL
Module Load Point 5	95% MEL
Module Load Point 4 <b>(Mid-point of Operating Range)</b>	80% MEL
Module Load Point 3	70% MEL
Module Load Point 2 <b>(Lower of MRL+10% or Minimum Stable Operating Level)</b>	MRL+10% or MSOL
Module Load Point 1 <b>(Minimum regulating level)</b>	MRL

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ECP.A.5.8.7 The tests are divided into the following three types;

- (i) Frequency response compliance and volume tests as per ECP.A.5.8. Figure 1. These tests consist of frequency profile and ramp tests and adjustments to the target frequency setpoint **as per ECP.5.8 Figure 3.-**
- (ii) System islanding and step response tests as shown by ECP.A.5.8. Figure 2.

- (iii) Frequency response tests in **Limited Frequency Sensitive Mode (LFSM)** to demonstrate **LFSM-O** and **LFSM-U** capability as shown by ECP.A.5.8 Figure 2.

ECP.A.5.8.8 There should be sufficient time allowed between tests for control systems to reach steady state. Where the diagram states 'HOLD' the current injection should be maintained until the **Active Power (MW)** output of the **Synchronous Power Generating Module** or **CCGT Module** has stabilised. The frequency response capability test (see Figure 1) injection signal shall be returned to zero at the same rate at which it was applied. **NGET** may require repeat tests should the tests give unexpected results.

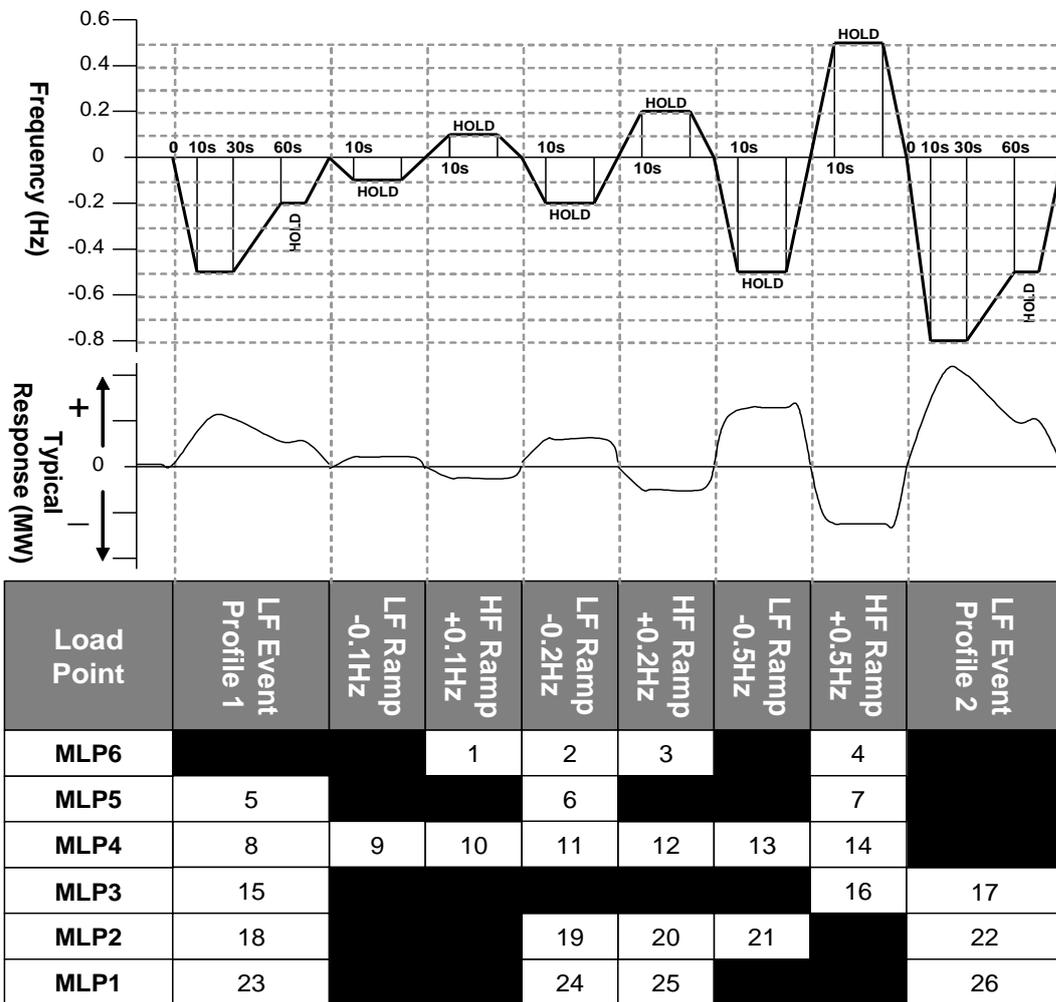


Figure 1: Frequency Response Capability FSM Ramp Response Tests

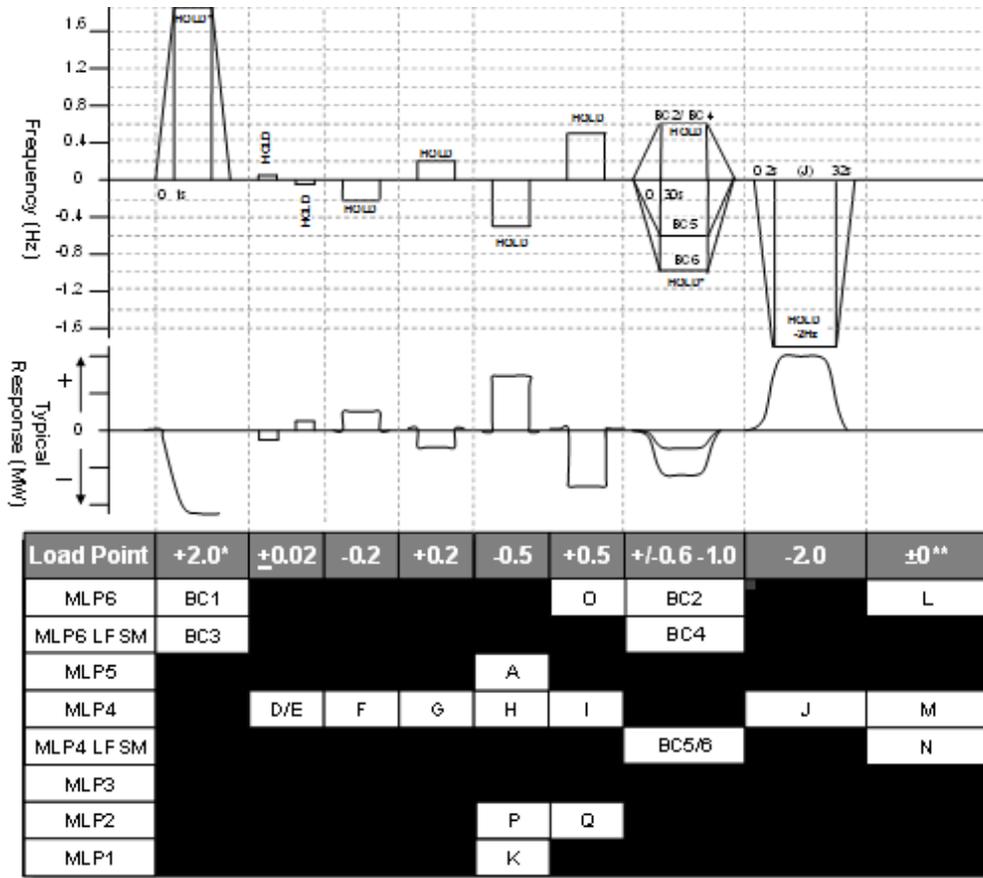


Figure 2: [Frequency Response Capability LFSM-O, LFSM-U and FSM Step Response Tests](#) [System islanding and step response tests](#)

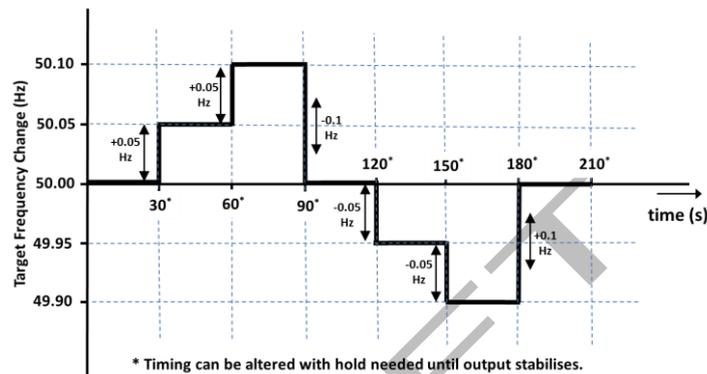
\* This will generally be +2.0Hz unless an injection of this size causes a reduction in plant output that takes the operating point below **Minimum Stable Operating Level** in which case an appropriate injection should be calculated in accordance with the following:  
 For example 0.9Hz is needed to take an initial output 65% to a final output of 20%. If the initial output was not 65% and the **Minimum Stable Operating Level** is not 20% then the injected step should be adjusted accordingly as shown in the example given below

Initial Output 65%  
**Minimum Stable Operating Level** 20%  
 Frequency Controller Droop 4%  
 Frequency to be injected =  $(0.65-0.20) \times 0.04 \times 50 = 0.9\text{Hz}$

\*\* Tests L and M in Figure 2 shall be conducted if in this range of tests the system frequency feedback signal is replaced by the injection signal rather than the injection signal being added to the system frequency signal. The tests will consist of monitoring the

**Synchronous Power Generating Module and CCGT Module in Frequency Sensitive Mode** during normal system frequency variations without applying any injection. Test N in figure 2 shall be conducted in all cases. All three tests should be conducted for a period of at least 10 minutes.

ECP.A.5.8.98 The target frequency adjustment facility should be demonstrated from the normal control point within the range of 49.9Hz to 50.1Hz by step changes to the target frequency setpoint as indicated in ECP.A.5.8 Figure 3-



ECP.A.5.8 Figure 3 – Target Frequency setting changes

ECP.A.5.9 Compliance with ECC.6.3.3 Functionality Test

ECP.A.5.9.1 Where the plant design includes active control function or functions to deliver ECC.6.3.3 compliance, the **Generator** will propose and agree a test procedure with **NGET**, which will demonstrate how the **Synchronous Power Generating Module Active Power** output responds to changes in **System Frequency** and ambient conditions (e.g. by **Frequency** and temperature injection methods).

ECP.A.5.9.2 The **Generator** shall inform **NGET** if any load limiter control is additionally employed.

ECP.A.5.9.3 With Setpoint to the signals specified in ECP.A.4, **NGET** will agree with the **Generator** which additional control system parameters shall be monitored to demonstrate the functionality of ECC.6.3.3 compliance systems. Where **NGET** recording equipment is not used results shall be supplied to **NGET** in an electronic spreadsheet format

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## APPENDIX 6

### COMPLIANCE TESTING OF POWER PARK MODULES

#### ECP.A.6.1 SCOPE

ECP.A.6.1.1 This Appendix outlines the general testing requirements for **Power Park Modules** and **OTSDUA** to demonstrate compliance with the relevant aspects of the **Grid Code**, **Ancillary Services Agreement** and **Bilateral Agreement**. The tests specified in this Appendix will normally be sufficient to demonstrate compliance however **NGET** may:

- i) agree an alternative set of tests provided **NGET** deem the alternative set of tests sufficient to demonstrate compliance with the **Grid Code**, **Ancillary Services Agreement** and **Bilateral Agreement**; and/or
- ii) require additional or alternative tests if information supplied to **NGET** during the compliance process suggests that the tests in this Appendix will not fully demonstrate compliance with the relevant section of the **Grid Code**, **Ancillary Services Agreement** or **Bilateral Agreement**; and/or
- iii) require additional tests if a **Power System Stabiliser** is fitted; and/or
- iv) agree a reduced set of tests if a relevant **Manufacturer's Data & Performance Report** has been submitted to and deemed to be appropriate by **NGET**; and/or
- v) agree a reduced set of tests for subsequent **Power Park Modules** or **OTSDUA** following successful completion of the first **Power Park Module** or **OTSDUA** tests in the case of a **Power Station** comprised of two or more **Power Park Modules** or **OTSDUA** which **NGET** reasonably considers to be identical.

If:

- (a) the tests performed pursuant to ECP.A.6.1.1(iv) do not replicate the results contained in the **Manufacturer's Data & Performance Report** or
- (b) the tests performed pursuant to ECP.A.6.1.1(v) in respect of subsequent **Power Park Modules** or **OTSDUA** do not replicate the full tests for the first **Power Park Module** or **OTSDUA**, or
- (c) any of the tests performed pursuant to ECP.A.6.1.1(iv) or ECP.A.6.1.1(v) do not fully demonstrate compliance with the relevant aspects of the **Grid Code**, **Ancillary Services Agreement** and / or **Bilateral Agreement**,

then notwithstanding the provisions above, the full testing requirements set out in this Appendix will be applied.

- ECP.A.6.1.2 The **Generator** is responsible for carrying out the tests set out in and in accordance with this Appendix and the **Generator** retains the responsibility for the safety of personnel and plant during the test. **NGET** will witness all of the tests outlined or agreed in relation to this Appendix unless **NGET** decides and notifies the **Generator** otherwise. Reactive Capability tests may be witnessed by **NGET** remotely from the **NGET** control centre. For all on site **NGET** witnessed tests the **Generator** must ensure suitable representatives from the **Generator** and / or **Power Park Module** manufacturer (if appropriate) and/or **OTSDUA** manufacturer (if appropriate) are available on site for the entire testing period. In all cases and in addition to any recording of signals conducted by **NGET** the **Generator** shall record all relevant test signals as outlined in ECP.A.4.
- ECP.A.6.1.3 In addition to the dynamic signals supplied in ECP.A.4 the **Generator** shall inform **NGET** of the following information prior to the commencement of the tests and any changes to the following, if any values change during the tests:
- (i) All relevant transformer tap numbers; and
  - (ii) Number of **Power Park Units** in operation
- ECP.A.6.1.4 The **Generator** shall submit a detailed schedule of tests to **NGET** in accordance with CP.6.3.1, and this Appendix.
- ECP.A.6.1.5 Prior to the testing of a **Power Park Module** or **OTSDUA** the **Generator** shall complete the **Integral Equipment Tests** procedure in accordance with OC.7.5
- ECP.A.6.1.6 Partial **Power Park Module** or **OTSDUA** testing as defined in ECP.A.6.2 and ECP.A.6.3 is to be completed at the appropriate stage in accordance with ECP.6, ECP6.4A, ECP6.4B.
- ECP.A.6.1.7 Full **Power Park Module** or **OTSDUA** testing as required by CP.7.2 is to be completed as defined in ECP.A.6.4 through to ECP.A.6.7
- ECP.A.6.1.8 Where **OTSDUW Arrangements** apply and prior to the **OTSUA Transfer Time** any relevant **OTSDUW Plant and Appartus** shall be considered within the scope of testing described in this Appendix. Performance shall be assessed against the relevant Grid Code requirements for **OTSDUW Plant and Appartus** at the **Interface Point** and other **Generator Plant and Appartus** at the **Offshore Grid Entry Point**. This Appendix should be read accordingly.
- ECP.A.6.1.9 **NGET** will permit relaxation from the requirement ECP.A.6.2 to ECP.A.6.8 where an **Equipment Certificate** for the **Power Park Module** has been provided which details the characteristics from tests on a representative installation with the same equipment and settings and the performance of the **Power Park Module** can, in **NGET**'s opinion, reasonably represent that of the installed **Power Park Module** at that site. For **Type B, Type C** and **Type D Power Park Modules** the relevant **Equipment Certificate** must be supplied in the **Power Generating Module Document** or **Users Data File structure** as applicable.

ECP.A.6.2 Pre 20% (or <50MW) Synchronised Power Park Module Basic Voltage Control Tests

ECP.A.6.2.1 Before 20% of the **Power Park Module** (or 50MW if less) has commissioned, either voltage control test ECP.A.6.5.6(i) or (ii) must be completed in accordance with ECP.6, ECP.6A or ECP.6B. In the case of an **Offshore Power Park Module** the test must be completed by the **Generator** undertaking **OTSDUW** or the **Offshore Transmission Licensee** under STCP19-5.

ECP.A.6.2.2 In the case of an **Offshore Power Park Module** which provides all or a portion of the **Reactive Power** capability as described in ECC.6.3.2.5.2 or ECP.6.3.2.6.3 and / or voltage control requirements as described in ECC.6.3.8.5 to enable an **Offshore Transmission Licensee** to meet the requirements of **STC** Section K, the **Generator** is required to cooperate with the **Offshore Transmission Licensee** to conduct the 20% voltage control test. The results in relation to the **Offshore Power Park Module** will be assessed against the requirements in the **Bilateral Agreement**.

ECP.A.6.3 Power Park Modules with Maximum Capacity  $\geq$ 100MW Pre 70% Power Park Module Tests

ECP.A.6.3.1 Before 70% but with at least 50% of the **Power Park Module** commissioned the following **Limited Frequency Sensitive** tests as detailed in ECP.A.6.6.2 must be completed.

[\(a\)](#) BC3

[\(b\)](#) BC4

ECP.A.6.4 Reactive Capability Test

ECP.A.6.4.1 This section details the procedure for demonstrating the reactive capability of an **Onshore Power Park Module** or an **Offshore Power Park Module** or **OTSDUA** which provides all or a portion of the **Reactive Power** capability as described in ECC.6.3.2.5.2 or ECP.6.3.2.6.3 as applicable (for the avoidance of doubt, an **Offshore Power Park Module** which does not provide part of the **Offshore Transmission Licensee Reactive Power** capability as described in ECC.6.3.2.5.1 and ECP.6.3.2.6.1 should complete the **Reactive Power** transfer / voltage control tests as per section ECP.A.6.8). These tests should be scheduled at a time where there are at least 95% of the **Power Park Units** within the **Power Park Module** in service. There should be sufficient MW resource forecasted in order to generate at least 85% of **Maximum Capacity** of the **Power Park Module**.

ECP.A.6.4.2 The tests shall be performed by modifying the voltage set-point of the voltage control scheme of the **Power Park Module** or **OTSDUA** by the amount necessary to demonstrate the required reactive range. This is to be conducted for the operating points and durations specified in ECP.A.6.4.5.

ECP.A.6.4.3 An **Embedded Generator** or **Embedded Generator** undertaking **OTSDUW** should liaise with the relevant **Network Operator** to ensure

the following tests will not have an adverse impact upon the **Network Operator's System** as per OC.7.5. In situations where the tests have an adverse impact upon the **Network Operator's System** NGET will only require demonstration within the acceptable limits of the **Network Operator**. For the avoidance of doubt, these tests do not negate the requirement to produce a complete **Power Park Module** or **OTSDUA** performance chart as specified in OC2.4.2.1

ECP.A.6.4.4 In the case where the **Reactive Power** metering point is not at the same location as the **Reactive Power** capability requirement, then an equivalent **Reactive Power** capability for the metering point shall be agreed between the **Generator** and **NGET**.

ECP.A.6.4.5 The following tests shall be completed:

- (i) Operation in excess of 60% **Maximum Capacity** and maximum continuous lagging **Reactive Power** for 30 minutes.
- (ii) Operation in excess of 60% **Maximum Capacity** and maximum continuous leading **Reactive Power** for 30 minutes.
- (iii) Operation at 50% **Maximum Capacity** and maximum continuous leading **Reactive Power** for 30 minutes.
- (iv) Operation at 20% **Maximum Capacity** and maximum continuous leading **Reactive Power** for 60 minutes.
- (v) Operation at 20% **Maximum Capacity** and maximum continuous lagging **Reactive Power** for 60 minutes.
- (vi) Operation at less than 20% **Maximum Capacity** and unity **Power Factor** for 5 minutes. This test only applies to systems which do not offer voltage control below 20% of **Maximum Capacity**.
- (vii) Operation at the lower of the **Minimum Stable Operating Level** or 0% **Maximum Capacity** and maximum continuous leading **Reactive Power** for 5 minutes. This test only applies to systems which offer voltage control below 20% and hence establishes actual capability rather than required capability.
- (viii) Operation at the lower of the **Minimum Stable Operating Level** or 0% **Maximum Capacity** and maximum continuous lagging **Reactive Power** for 5 minutes. This test only applies to systems which offer voltage control below 20% and hence establishes actual capability rather than required capability.

ECP.A.6.4.6 Within this ECP lagging **Reactive Power** is the export of **Reactive Power** from the **Power Park Module** to the **Total System** and leading **Reactive Power** is the import of **Reactive Power** from the **Total System** to the **Power Park Module** or **OTSDUA**.

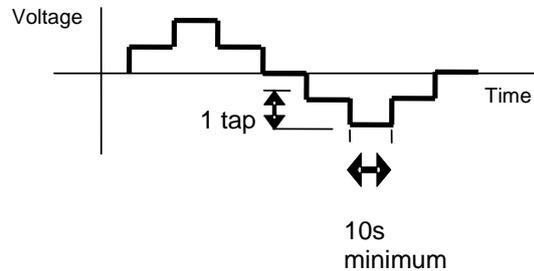
ECP.A.6.5 Voltage Control Tests

- ECP.A.6.5.1 This section details the procedure for conducting voltage control tests on **Onshore Power Park Modules** or **OTSDUA** or an **Offshore Power Park Module** which provides all or a portion of the voltage control capability as described in ECC.6.3.8.5 (for the avoidance of doubt, **Offshore Power Park Modules** which do not provide part of the **Offshore Transmission Licensee** voltage control capability as described in CC6.3.8.5 should complete the **Reactive Power** transfer / voltage control tests as per section ECP.A.6.8). These tests should be scheduled at a time when there are at least 95% of the **Power Park Units** within the **Power Park Module** in service. There should be sufficient MW resource forecasted in order to generate at least 65% of **Maximum Capacity** of the **Onshore Power Park Module**. An **Embedded Generator** or **Embedded Generators** undertaking **OTSDUW** should also liaise with the relevant **Network Operator** to ensure all requirements covered in this section will not have a detrimental effect on the **Network Operator's System**.
- ECP.A.6.5.2 The voltage control system shall be perturbed with a series of step injections to the **Power Park Module** voltage Setpoint, and where possible, multiple up-stream transformer taps. In the case of an **Offshore Power Park Module** providing part of the **Offshore Transmission Licensee** voltage control capability this may require a series of step injections to the voltage Setpoint of the **Offshore Transmission Licensee** control system.
- ECP.A.6.5.3 For steps initiated using network tap changers the **Generator** will need to coordinate with **NGET** or the relevant **Network Operator** as appropriate. The time between transformer taps shall be at least 10 seconds as per ECP.A.6.5 Figure 1.
- ECP.A.6.5.4 For step injection into the **Power Park Module** or **OTSDUA** voltage Setpoint, steps of  $\pm 1\%$  and  $\pm 2\%$  (or larger if required by NGET) shall be applied to the voltage control system Setpoint summing junction. The injection shall be maintained for 10 seconds as per ECP.A.6.5 Figure 2.
- ECP.A.6.5.5 Where the voltage control system comprises of discretely switched plant and apparatus additional tests will be required to demonstrate that its performance is in accordance with **Grid Code** and **Bilateral Agreement** requirements.

ECP.A.6.5.6 Tests to be completed:

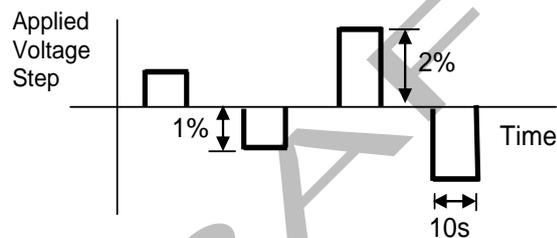
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(i)



ECP.A.6.5 Figure 1 – Transformer tap sequence for voltage control tests

(ii)



ECP.A.6.5 Figure 2 – Step injection sequence for voltage control tests

ECP.A.6.5.7 In the case of **OTSDUA** where the **Bilateral Agreement** specifies additional damping facilities additional testing to demonstrate these damping facilities may be required.

ECP.A.6.6 Frequency Response Tests

ECP.A.6.6.1 This section describes the procedure for performing frequency response testing on a **Power Park Module**. These tests should be scheduled at a time where there are at least 95% of the **Power Park Units** within the **Power Park Module** in service. There should be sufficient MW resource forecasted in order to generate at least 65% of **Maximum Capacity** of the **Power Park Module**.

ECP.A.6.6.2 The frequency controller shall be in **Frequency Sensitive Mode** or **Limited Frequency Sensitive Mode** as appropriate for each test. Simulated frequency deviation signals shall be injected into the frequency controller setpoint/feedback summing junction. If the injected frequency signal replaces rather than sums with the real system frequency signal then the additional tests outlined in ECP.A.6.6.6 shall be performed with the **Power Park Module** or **Power Park Unit** in normal **Frequency Sensitive Mode** monitoring actual system frequency, over a period of at least 10 minutes. The aim

of this additional test is to verify that the control system correctly measures the real system frequency for normal variations over a period of time.

ECP.A.6.6.3 In addition to the frequency response requirements it is necessary to demonstrate the **Power Park Module** ability to deliver a requested steady state power output which is not impacted by power source variation as per ECC.6.3.9. This test shall be conducted in **Limited Frequency Sensitive Mode** at a part-loaded output for a period of 10 minutes as per ECP.A.6.6.6.

Preliminary Frequency Response Testing

ECP.A.6.6.4 Prior to conducting the full set of tests as per ECP.A.6.6.6, **Generators** are required to conduct the preliminary set of tests below to confirm the frequency injection method is correct and the plant control performance is within expectation. The test numbers refer to Figure 1 below. The test should be conducted when sufficient MW resource is forecasted in order to generate at least 65% of **Maximum Capacity** of the **Power Park Module**. The following frequency injections shall be applied when operating at module load point 4.

Test No (Figure1)	Frequency Injection	Notes
8	<ul style="list-style-type: none"> <li>Inject -0.5Hz frequency fall over 10 sec</li> <li>Hold for a further 20 sec</li> <li>At 30 sec from the start of the test, Inject a +0.3Hz frequency rise over 30 sec.</li> <li>Hold until conditions stabilise</li> <li>Remove the injected signal <b>as a ramp over 10 seconds</b></li> </ul>	
13	<ul style="list-style-type: none"> <li>Inject - 0.5Hz frequency fall over 10 sec</li> <li>Hold until conditions stabilise</li> <li>Remove the injected signal <b>as a ramp over 10 seconds</b></li> </ul>	
14	<ul style="list-style-type: none"> <li>Inject +0.5Hz frequency rise over 10 sec</li> <li>Hold until conditions stabilise</li> <li>Remove the injected signal <b>as a ramp over 10 seconds</b></li> </ul>	
H	<ul style="list-style-type: none"> <li>Inject - 0.5Hz frequency fall as a stepchange</li> <li>Hold until conditions stabilise</li> <li>Remove the injected signal <b>as a stepchange</b></li> </ul>	
I	<ul style="list-style-type: none"> <li>Inject +0.5Hz frequency rise as a stepchange</li> <li>Hold until conditions stabilise</li> <li>Remove the injected signal <b>as a stepchange</b></li> </ul>	

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ECP.A.6.6.5 The recorded results (e.g. Finj, MW and control signals) should be sampled at a minimum rate of 1 Hz to allow **NGET** to assess the plant performance from the initial transients (seconds) to the final steady state conditions (5-15 minutes depending on the plant design). This is not witnessed by **NGET**. The **Generator** shall supply the recordings including data to **NGET** in an electronic spreadsheet format. Results shall be legible, identifiable by labelling, and shall have appropriate scaling.

Full Frequency Response Testing Schedule Witnessed by **NGET**

ECP.A.6.6.6 The tests are to be conducted at a number of different Module Load Points (MLP). In the case of a **Power Park Module** the module load points are conducted as shown below unless agreed otherwise by **NGET**.

Module Load Point 6 <b>(Maximum Export Limit)</b>	100% MEL
Module Load Point 5	90% MEL
Module Load Point 4 (Mid point of Operating Range)	80% MEL
Module Load Point 3	MRL+20%
Module Load Point 2 Lower of MRL +10% or <b>Minimum Stable Operating Level</b>	MRL+10% or MSOL
Module Load Point 1 <b>(Minimum regulating level)</b>	MRL

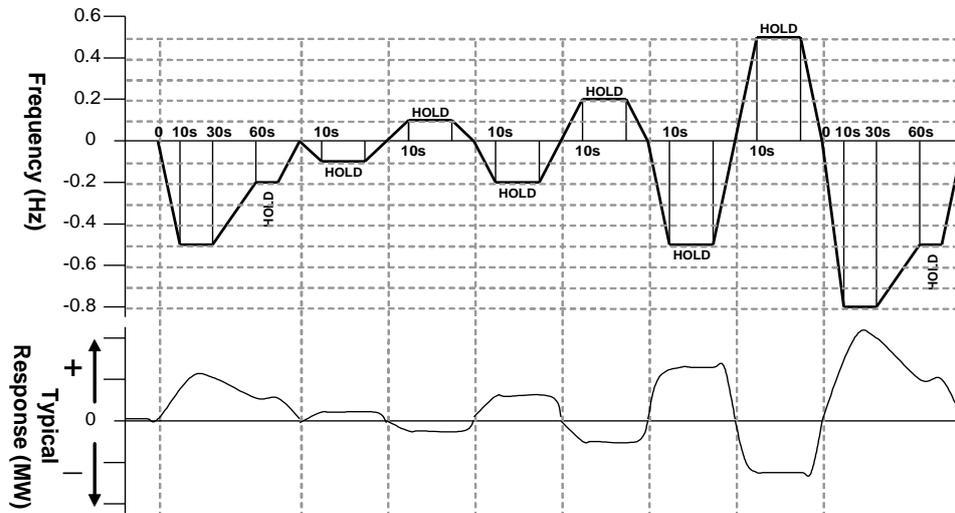
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ECP.A.6.6.7 The tests are divided into the following two types;

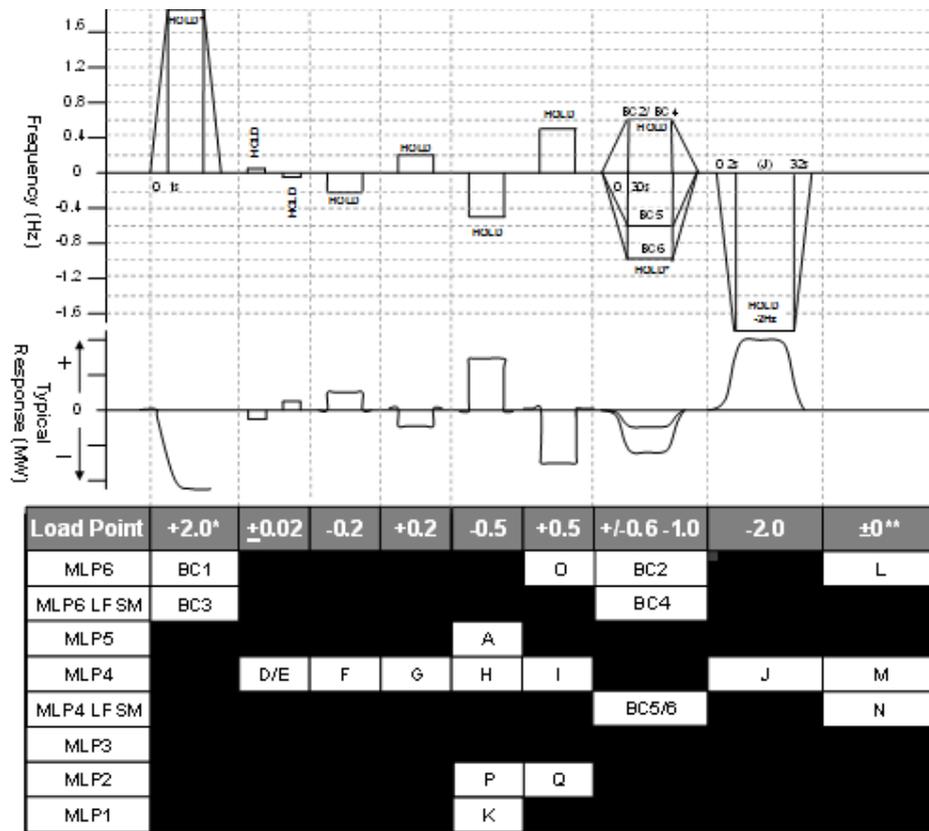
- (i) Frequency response compliance and volume tests as per ECP.A.65.68. Figure 1. These tests consist of frequency profile and ramp tests and adjustments to target frequency setpoint as per ECP.A.6.6 Figure 3.-
- (ii) System islanding and step response tests as shown by ECP.A.6.6. Figure 2.
- (iii) Frequency response tests in **Limited Frequency Sensitive Mode (LFSM)** to demonstrate **LFSM-O** and **LFSM-U** capability as shown by ECP.A.6.6 Figure 2.

ECP.A.6.6.8 There should be sufficient time allowed between tests for control systems to reach steady state (depending on available power resource). Where the diagram states 'HOLD' the current injection should be maintained until the **Active Power** (MW) output of the **Power Park Module** has stabilised. All frequency response tests should be removed over the same timescale for which they were applied. **NGET** may require repeat tests should the response volume be affected by the available power, or if tests give unexpected results.



Load Point	LF Event Profile 1	LF Ramp -0.1Hz	HF Ramp +0.1Hz	LF Ramp -0.2Hz	HF Ramp +0.2Hz	LF Ramp -0.5Hz	HF Ramp +0.5Hz	LF Event Profile 2
MLP6			1	2	3		4	
MLP5	5			6			7	
MLP4	8	9	10	11	12	13	14	
MLP3	15						16	17
MLP2	18			19	20	21		22
MLP1	23			24	25			26

ECP.A.6.6. Figure 1 – Frequency Response Capability FSM Ramp~~volume~~ Response tests



ECP.A.6.6. Figure 2 – [Frequency Response Capability LFSM-O, LFSM-U, FSM Step Response System islanding and step response tests](#)

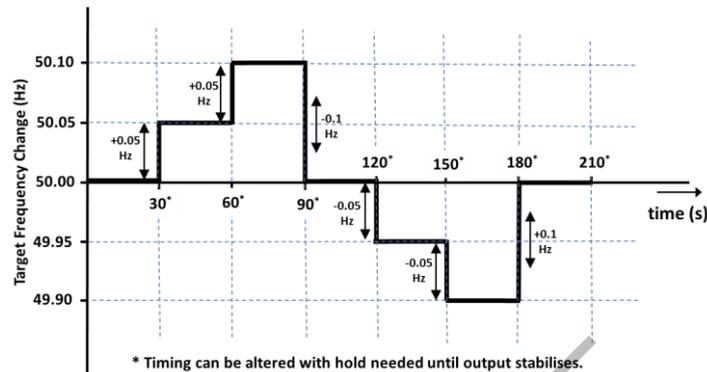
\* This will generally be +2.0Hz unless an injection of this size causes a reduction in plant output that takes the operating point below **Minimum Stable Operating Level** in which case an appropriate injection should be calculated in accordance with the following:

For example 0.9Hz is needed to take an initial output 65% to a final output of 20%. If the initial output was not 65% and the **Minimum Stable Operating Level** is not 20% then the injected step should be adjusted accordingly as shown in the example given below

Initial Output 65%  
**Minimum Stable Operating Level** 20%  
 Frequency Controller Droop 4%  
 Frequency to be injected =  $(0.65-0.20) \times 0.04 \times 50 = 0.9\text{Hz}$

\*\* Tests L and M in Figure 2 shall be conducted if in this range of tests the system frequency feedback signal is replaced by the injection signal rather than the injection signal being added to the system frequency signal. The tests will consist of monitoring the **Power Park Module** in **Frequency Sensitive Mode** during normal system frequency variations without applying any injection. Test N in Figure 2 shall be conducted in all cases. All three tests should be conducted for a period of at least 10 minutes.

ECP.A.6.6.9 The target frequency adjustment facility should be demonstrated from the normal control point within the range of 49.9Hz to 50.1Hz by step changes to the target frequency setpoint as indicated in ECP.A.6.6 Figure 3.-



ECP.A.6.6. Figure 3 – Target Frequency setting changes

ECP.A.6.7 Fault Ride Through Testing

ECP.A.6.7.1 This section describes the procedure for conducting fault ride through tests on a single **Power Park Unit**– as required by ECP.7.2.2(d).

ECP.A.6.7.2 The test circuit will utilise the full **Power Park Unit** with no exclusions (e.g. in the case of a wind turbine it would include the full wind turbine structure) and shall be conducted with sufficient resource available to produce at least 95% of the **Maximum Capacity** of the **Power Park Unit**. The test will comprise of a number of controlled short circuits applied to a test network to which the **Power Park Unit** is connected, typically comprising of the **Power Park Unit** transformer and a test impedance to shield the connected network from voltage dips at the **Power Park Unit** terminals.

ECP.A.6.7.3 In each case the tests should demonstrate the minimum voltage at the **Power Park Unit** terminals or **High Voltage** side of the **Power Park Unit** transformer which the **Power Park Unit** can withstand for the length of time specified in ECP.A.6.7.5. Any test results provided to **NGET** should contain sufficient data pre and post fault in order to determine steady state values of all signals, and the power recovery timescales.

ECP.A.6.7.4 In addition to the signals outlined in ECP.A.4.2. the following signals from either the **Power Park Unit** terminals or **High Voltage** side of the **Power Park Unit** transformer should be provided for this test only:

- (i) Phase voltages
- (ii) Positive phase sequence and negative phase sequence voltages
- (iii) Phase currents
- (iv) Positive phase sequence and negative phase sequence currents

- (v) Estimate of **Power Park Unit** negative phase sequence impedance
- (vi) MW – **Active Power** at the power generating module.
- (vii) MVAR – **Reactive Power** at the power generating module.
- (viii) Mechanical Rotor Speed
- (ix) Real / reactive, current / power Setpoint as appropriate
- (x) Fault ride through protection operation (e.g. a crowbar in the case of a doubly fed induction generator)
- (xi) Any other signals relevant to the control action of the fault ride through control deemed applicable for model validation.

At a suitable frequency rate for fault ride through tests as agreed with **NGET**.

ECP.A.6.7.5 The tests should be conducted for the times and fault types indicated in ECC.6.3.15 as applicable.

| ECP.A.6.8 Reactive Power Transfer / Voltage Control Tests for **Offshore Power Park Modules**

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ECP.A.6.8.1 In the case of an **Offshore Power Park Module** which provides all or a portion of the **Reactive Power** capability as described in ECP.6.3.2.5.2 or ECP.6.3.6.3 and / or voltage control requirements as described in ECC.6.3.8.5 to enable an **Offshore Transmission Licensee** to meet the requirements of **STC** Section K, the testing, will comprise of the entire control system responding to changes at the onshore **Interface Point**. Therefore the tests in this section ECP.A.6.8 will not apply. The **Generator** shall cooperate with the relevant **Offshore Transmission Licensee** to facilitate these tests as required by **NGET**. The testing may be combined with testing of the corresponding **Offshore Transmission Licensee** requirements under the **STC**. The results in relation to the **Offshore Power Park Module** will be assessed against the requirements in the **Bilateral Agreement**.

ECP.A.6.8.2 In the case of an **Offshore Power Park Module** which does not provide part of the **Offshore Transmission Licensee Reactive Power** capability the following procedure for conducting **Reactive Power** transfer control tests on **Offshore Power Park Modules** and / or voltage control system as per CC6.3.2(e)(i) and CC6.3.2(e)(ii) apply. These tests should be carried out prior to 20% of the **Power Park Units** within the **Offshore Power Park Module** being synchronised, and again when at least 95% of the **Power Park Units** within the **Offshore Power Park Module** in service. There should be sufficient power resource forecast to generate at least 85% of the **Maximum Capacity** of the **Offshore Power Park Module**.

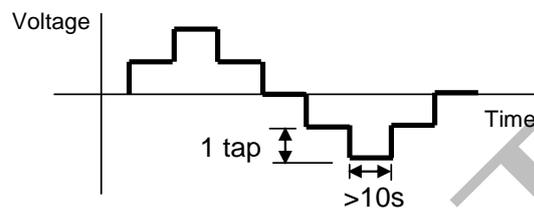
ECP.A.6.8.3 The **Reactive Power** control system shall be perturbed by a series of system voltage changes and changes to the **Active Power** output of the **Offshore Power Park Module**.

ECP.A.6.8.4 System voltage changes should be created by a series of multiple upstream transformer taps. The **Generator** should coordinate with **NGET** or the relevant **Network Operator** in order to conduct the

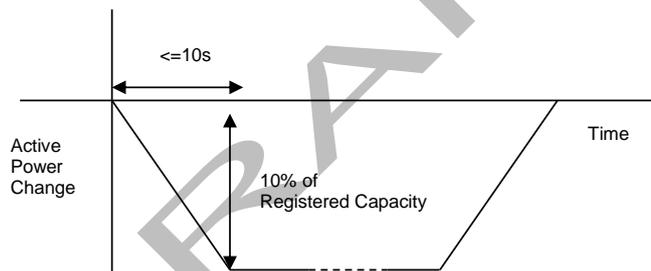
required tests. The time between transformer taps should be at least 10 seconds as per ECP.A.6.8 Figure 1.

ECP.A.6.8.5 The active power output of the **Offshore Power Park Module** should be varied by applying a sufficiently large step to the frequency controller Setpoint/feedback summing junction to cause a 10% change in output of the **Maximum Capacity** of the **Offshore Power Park Module** in a time not exceeding 10 seconds. This test does not need to be conducted provided that the frequency response tests as outlined in ECP.A.6.6 are completed.

ECP.A.6.8.6 The following diagrams illustrate the tests to be completed:



ECP.A.6.8 Figure 1 – Transformer tap sequence for reactive transfer tests



ECP.A.6.8 Figure 2 – Active Power ramp for reactive transfer tests

## APPENDIX 7

### COMPLIANCE TESTING FOR HVDC EQUIPMENT

#### | ECP.A.7.1 SCOPE

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ECP.A.7.1.1 This Appendix outlines the general testing requirements for **HVDC System Owners** to demonstrate compliance with the relevant aspects of the **Grid Code, Ancillary Services Agreement** and **Bilateral Agreement**. The tests specified in this Appendix will normally be sufficient to demonstrate compliance however **NGET** may:

- i) agree an alternative set of tests provided **NGET** deem the alternative set of tests sufficient to demonstrate compliance with the **Grid Code, Ancillary Services Agreement** and **Bilateral Agreement**; and/or
- ii) require additional or alternative tests if information supplied to **NGET** during the compliance process suggests that the tests in this Appendix will not fully demonstrate compliance with the relevant section of the **Grid Code, Ancillary Services Agreement** or **Bilateral Agreement**; and/or
- iii) require additional tests if control functions to improve damping of power system oscillations and/or subsynchronous resonance torsional oscillations required by the **Bilateral Agreement** or included in the control scheme and active; and/or
- iv) agree a reduced set of tests for subsequent **HVDC Equipment** following successful completion of the first **HVDC Equipment** tests in the case of a installation comprising of two or more **HVDC Systems** or **DC Connected Power Park Modules** which **NGET** reasonably considers to be identical.

If:

- (a) the tests performed pursuant to ECP.A.7.1.1(iv) in respect of subsequent **HVDC Systems** or **DC Connected Power Park Modules** do not replicate the full tests for the first **HVDC Equipment** , or
- (b) any of the tests performed pursuant to ECP.A.7.1.1(iv) do not fully demonstrate compliance with the relevant aspects of the **Grid Code, Ancillary Services Agreement** and / or **Bilateral**

ECP.A.7.1.2 The **HVDC System Owner** is responsible for carrying out the tests set out in and in accordance with this Appendix and the **HVDC System Owner** retains the responsibility for the safety of personnel and plant during the test. The **HVDC System Owner** is responsible for ensuring that suitable arrangements are in place with the **Externally Interconnected System Operator** to facilitate testing. **NGET** will witness all of the tests outlined or agreed in relation to this Appendix unless **NGET** decides and notifies the **HVDC System Owner** otherwise. Reactive Capability tests if required, may be witnessed by **NGET** remotely from the **NGET** control centre. For all on site **NGET**

witnessed tests the **HVDC System Owner** must ensure suitable representatives from the **HVDC System Owner** and / or **HVDC Equipment** manufacturer (if appropriate) are available on site for the entire testing period. In all cases and in addition to any recording of signals conducted by **NGET** the **HVDC System Owner** shall record all relevant test signals as outlined in ECP.A.4.

ECP.A.7.1.3 In addition to the dynamic signals supplied in ECP.A.4 the **HVDC System Owner** shall inform **NGET** of the following information prior to the commencement of the tests and any changes to the following, if any values change during the tests:

(i) All relevant transformer tap numbers.

ECP.A.7.1.4 The **HVDC System Owner** shall submit a detailed schedule of tests to **NGET** in accordance with CP.6.3.1, and this Appendix.

ECP.A.7.1.5 Prior to the testing of **HVDC Equipment** the **HVDC System Owner** shall complete the **Integral Equipment Tests** procedure in accordance with OC.7.5

ECP.A.7.1.6 Full **HVDC Equipment** testing as required by ECP.7.2 is to be completed as defined in ECP.A.7.2 through to ECP.A.7.5

ECP.A.7.1.7 **NGET** will permit relaxation from the requirement ECP.A.7.2 to ECP.A.7.5 where an **Equipment Certificate** for **HVDC Equipment** has been provided which details the characteristics from tests on a representative installation with the same equipment and settings and the performance of the **HVDC Equipment** can, in **NGET's** opinion, reasonably represent that of the installed **HVDC Equipment** at that site. The relevant **Equipment Certificate** must be supplied in the **Users Data File structure**.

ECP.A.7.2 Reactive Capability Test

ECP.A.7.2.1 This section details the procedure for demonstrating the reactive capability of **HVDC Equipment**. These tests should be scheduled at a time where there are sufficient MW resource forecasted in order to import and export full **Maximum Capacity** of the **HVDC Equipment**.

ECP.A.7.2.2 The tests shall be performed by modifying the voltage set-point of the voltage control scheme of the **HVDC Equipment** by the amount necessary to demonstrate the required reactive range. This is to be conducted for the operating points and durations specified in ECP.A.7.2.5.

ECP.A.7.2.3 **Embedded HVDC System Owners** should liaise with the relevant **Network Operator** to ensure the following tests will not have an adverse impact upon the **Network Operator's System** as per OC.7.5. In situations where the tests have an adverse impact upon the **Network Operator's System** **NGET** will only require demonstration within the acceptable limits of the **Network Operator**. For the avoidance of doubt, these tests do not negate the requirement to produce a complete **HVDC Equipment** performance chart as specified in OC2.4.2.1

ECP.A.7.2.4 In the case where the **Reactive Power** metering point is not at the same location as the **Reactive Power** capability requirement, then an equivalent **Reactive Power** capability for the metering point shall be agreed between the **HVDC System Owner** and **NGET**.

ECP.A.7.2.5 The following tests shall be completed for both importing and exporting of Active Power for a **DC Converter**:

- (i) Operation at **Maximum Capacity** and maximum continuous lagging **Reactive Power** for 60 minutes.
- (ii) Operation at **Maximum Capacity** and maximum continuous leading **Reactive Power** for 60 minutes.
- (iii) Operation at 50% **Maximum Capacity** and maximum continuous leading **Reactive Power** for 60 minutes.
- (iv) Operation at 50% **Maximum Capacity** and maximum continuous lagging **Reactive Power** for 60 minutes.
- (v) Operation at **Minimum Capacity** and maximum continuous leading **Reactive Power** for 60 minutes.
- (vi) Operation at **Minimum Capacity** and maximum continuous lagging **Reactive Power** for 60 minutes.

ECP.A.7.2.6 For the avoidance of doubt, lagging **Reactive Power** is the export of **Reactive Power** from the **HVDC Equipment** to the **Total System** and leading **Reactive Power** is the import of **Reactive Power** from the **Total System** to the **HVDC Equipment**.

ECP.A.7.3 Not Used

ECP.A.7.4 Voltage Control Tests

ECP.A.7.4.1 This section details the procedure for conducting voltage control tests on **HVDC Equipment**. These tests should be scheduled at a time where there are sufficient MW resource in order to import and export **Maximum Capacity** of the **HVDC Equipment**. An **Embedded HVDC System Owner** should also liaise with the relevant **Network Operator** to ensure all requirements covered in this section will not have a detrimental effect on the **Network Operator's System**.

ECP.A.7.4.2 The voltage control system shall be perturbed with a series of step injections to the **HVDC Equipment** voltage Setpoint, and where possible, multiple up-stream transformer taps.

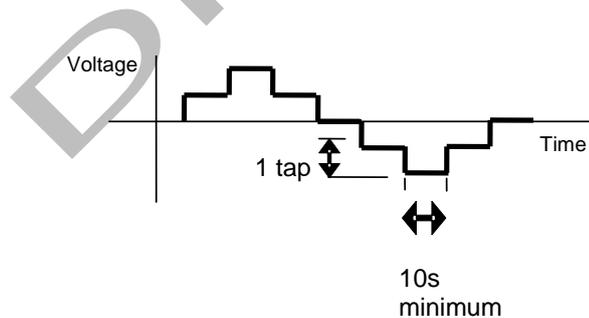
ECP.A.7.4.3 For steps initiated using network tap changers the **HVDC System Owner** will need to coordinate with **NGET** or the relevant **Network Operator** as appropriate. The time between transformer taps shall be at least 10 seconds as per ECP.A.7.4 Figure 1.

ECP.A.7.4.4 For step injection into the **HVDC Equipment** voltage Setpoint, steps of  $\pm 1\%$  and  $\pm 2\%$  shall be applied to the voltage control system Setpoint summing junction. The injection shall be maintained for 10 seconds as per ECP.A.7.4 Figure 2.

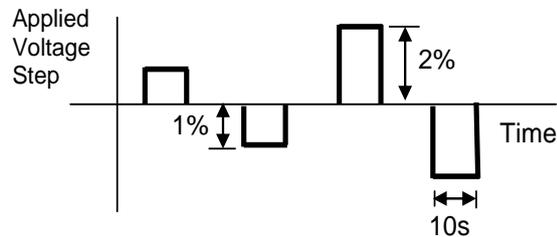
ECP.A.7.4.5 Where the voltage control system comprises of discretely switched plant and apparatus additional tests will be required to demonstrate that its performance is in accordance with **Grid Code** and **Bilateral Agreement** requirements.

ECP.A.7.4.6 Tests to be completed:

(i)



(ii)



ECP.A.7.4 Figure 2 – Step injection sequence for voltage control tests

#### ECP.A.7.5 Frequency Response Tests

ECP.A.7.5.1 This section describes the procedure for performing frequency response testing on **HVDC Equipment**. These tests should be scheduled at a time where there are sufficient MW resource in order to import and export full **Maximum Capacity** of the **HVDC Equipment**. The **HVDC System Owner** is responsible for ensuring that suitable arrangements are in place with the **Externally Interconnected System Operator** to facilitate the active power changes required by these tests

ECP.A.7.5.2 The frequency controller shall be in **Frequency Sensitive Mode** or **Limited Frequency Sensitive Mode** as appropriate for each test. Simulated frequency deviation signals shall be injected into the frequency controller Setpoint/feedback summing junction. If the injected frequency signal replaces rather than sums with the real system frequency signal then the additional tests outlined in ECP.A.7.5.6 shall be performed with the **HVDC Equipment** in normal **Frequency Sensitive Mode** monitoring actual system frequency, over a period of at least 10 minutes. The aim of this additional test is to verify that the control system correctly measures the real system frequency for normal variations over a period of time.

ECP.A.7.5.3 In addition to the frequency response requirements it is necessary to demonstrate the **HVDC Equipment** ability to deliver a requested steady state power output which is not impacted by power source variation as per ECC.6.3.9. This test shall be conducted in **Limited Frequency Sensitive Mode** at a part-loaded output for a period of 10 minutes as per ECP.A.7.5.6.

#### Preliminary Frequency Response Testing

ECP.A.7.5.4 Prior to conducting the full set of tests as per ECP.A.7.5.6, **HVDC System Owners** are required to conduct a preliminary set of tests below to confirm the frequency injection method is correct and the plant control performance is within expectation. The test numbers refer to Figure 1 below. These tests should be scheduled at a time where there are sufficient MW resource in order to export full

**Maximum Capacity from the HVDC Equipment** . The following frequency injections shall be applied when operating at module load point 4.

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Test No (Figure1)	Frequency Injection	Notes
8	<ul style="list-style-type: none"> <li>Inject -0.5Hz frequency fall over 10 sec</li> <li>Hold for a further 20 sec</li> <li>At 30 sec from the start of the test, Inject a +0.3Hz frequency rise over 30 sec.</li> <li>Hold until conditions stabilise</li> <li>Remove the injected signal <u>as a ramp over 10 seconds</u></li> </ul>	
13	<ul style="list-style-type: none"> <li>Inject - 0.5Hz frequency fall over 10 sec</li> <li>Hold until conditions stabilise</li> <li>Remove the injected signal <u>as a ramp over 10 seconds</u></li> </ul>	
14	<ul style="list-style-type: none"> <li>Inject +0.5Hz frequency rise over 10 sec</li> <li>Hold until conditions stabilise</li> <li>Remove the injected signal <u>as a ramp over 10 seconds</u></li> </ul>	
H	<ul style="list-style-type: none"> <li>Inject - 0.5Hz frequency fall as a stepchange</li> <li>Hold until conditions stabilise</li> <li>Remove the injected signal <u>as a stepchange</u></li> </ul>	
I	<ul style="list-style-type: none"> <li>Inject +0.5Hz frequency rise as a stepchange</li> <li>Hold until conditions stabilise</li> <li>Remove the injected signal <u>as a stepchange</u></li> </ul>	

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ECP.A.7.5.5 The recorded results (e.g. Finj, MW and control signals) should be sampled at a minimum rate of 1 Hz to allow **NGET** to assess the plant performance from the initial transients (seconds) to the final steady state conditions (5-15 minutes depending on the plant design). This is not witnessed by **NGET**. The **HVDC System Owner** shall supply the recordings including data to **NGET** in an electronic spreadsheet format. Results shall be legible, identifiable by labelling, and shall have appropriate scaling.

Full Frequency Response Testing Schedule Witnessed by **NGET**

ECP.A.7.5.6 The tests are to be conducted at a number of different Module Load Points (MLP). In the case of **HVDC Equipment** the load points are conducted as shown below unless agreed otherwise by **NGET**.

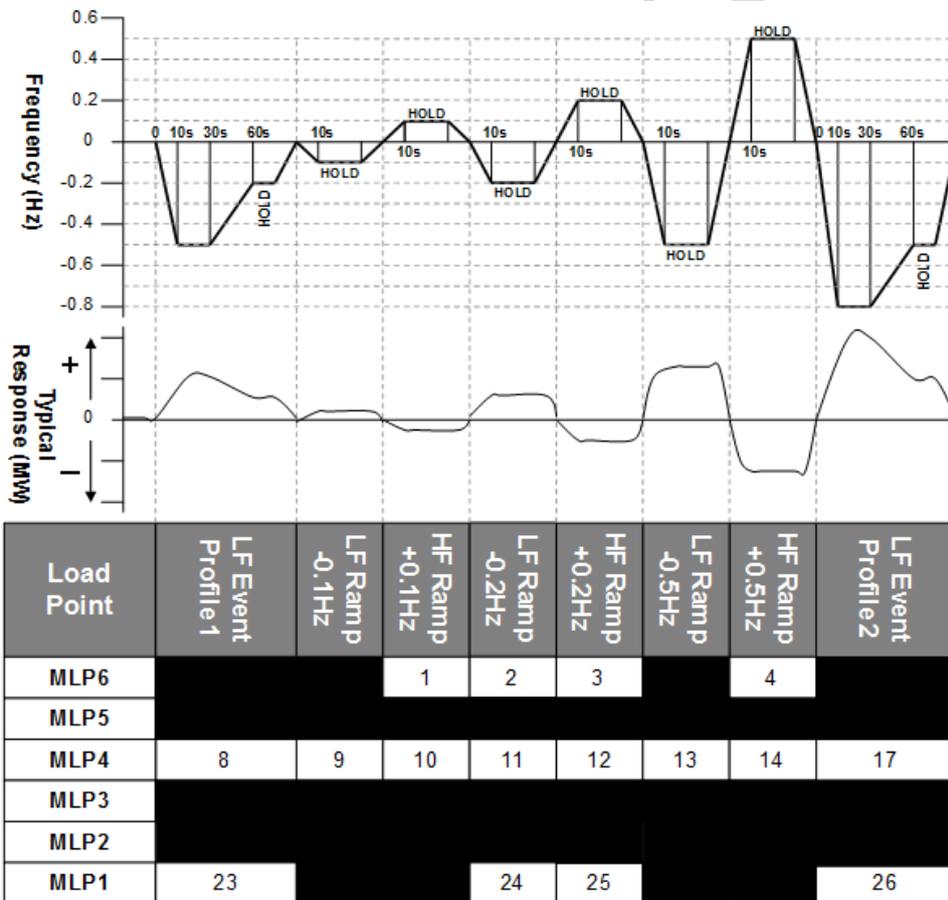
Module Load Point 6 (Maximum Export Limit)	100% MEL
Module Load Point 5	90% MEL
Module Load Point 4 (Mid point of Operating Range)	80% MEL
Module Load Point 3	MRL+20%
Module Load Point 2	MRL+10%
Module Load Point 1 (Minimum regulating level)	MRL

ECP.A.7.5.7 The tests are divided into the following two types;

- (i) Frequency response compliance and volume tests as per ECP.A.7.5. Figure 1. These tests consist of frequency profile and ramp tests and adjustments to target frequency setpoint as per ECP.A.7.5 Figure 3-
- (ii) System islanding and step response tests as shown by ECP.A.7.5 Figure 2

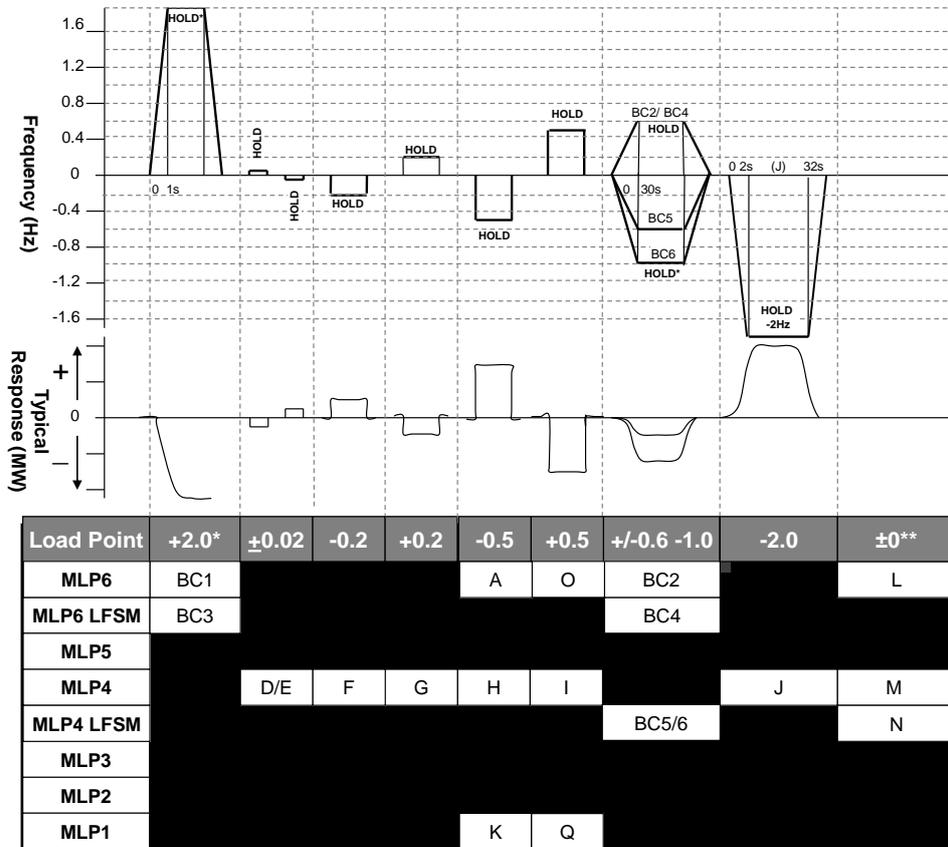
ECP.A.7.5. Fig 1 and 2 are shown for the Importing of Active Power, simulated frequency polarity should be reversed when exporting Active Power.

ECP.A.7.5.8 There should be sufficient time allowed between tests for control systems to reach steady state (depending on available power resource). Where the diagram states 'HOLD' the current injection should be maintained until the **Active Power** (MW) output of the **HVDC Equipment** has stabilised. All frequency response tests should be removed over the same timescale for which they were applied. **NGET** may require repeat tests should the response volume be affected by the available power, or if tests give unexpected results.



ECP.A.7.5. Figure 1 – Frequency Response Capability FSM Ramp Response volume tests

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ECP.A.7.5. Figure 2 – Frequency Response Capability LFSM-O, LFSM-U, FSM Step R System islanding and step response tests

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\* This will generally be +2.0Hz unless an injection of this size causes a reduction in plant output that takes the operating point below **Minimum Capacity** in which case an appropriate injection should be calculated in accordance with the following:

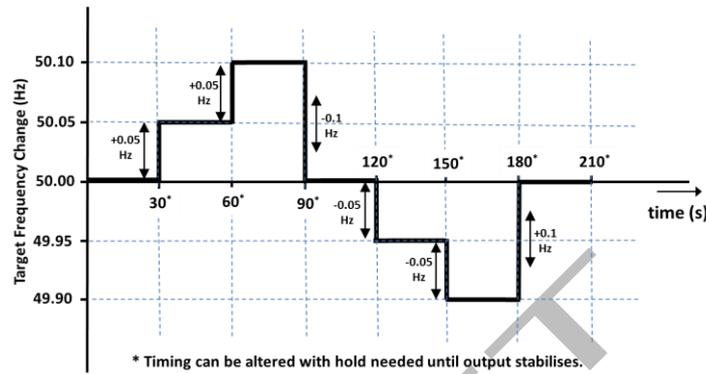
For example 0.9Hz is needed to take an initial output 65% to a final output of 20%. If the initial output was not 65% and the **Minimum Capacity** is not 20% then the injected step should be adjusted accordingly as shown in the example given below

Initial Output	65%
<b>Minimum Capacity</b>	20%
Frequency Controller Droop	4%
Frequency to be injected =	$(0.65-0.20) \times 0.04 \times 50 = 0.9\text{Hz}$

\*\* Tests L and M in Figure 2 shall be conducted if in this range of tests the system frequency feedback signal is replaced by the injection signal rather than the injection signal being added to the system frequency signal. The tests will consist of monitoring the **HVDC Equipment** in **Frequency Sensitive Mode** during normal system frequency variations without applying any injection. Test N in Figure 2

shall be conducted in all cases. All three tests should be conducted for a period of at least 10 minutes.

ECP.A.7.5.9 The target frequency adjustment facility should be demonstrated from the normal control point within the range of 49.9Hz to 50.1Hz by step changes to the target frequency setpoint as indicated in ECP.A.7.5 Figure 3.-



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ECP.A.7.5. Figure 3 – Target Frequency setting changes

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