

DISTRIBUTED RESTART – DRAFT LEGAL TEXT EXTRACTS FROM GRID CODE

DATED 25 March 2022

AJ COMMENTS INCLUDED 8 JULY 2022

Extracts from Glossary and Definitions

<u>Anchor Generator</u>	<u>A Generator who has a Restoration Service Contract in respect of any Anchor Plant the Generator owns and operates and in this context is a Restoration Service Provider.</u>
<u>Anchor DC Converter</u>	<u>An Embedded DC Converter with an Anchor Plant Capability.</u>
<u>Anchor DC Converter Owner</u>	<u>A DC Converter owner and/or operator who has a Restoration Service Contract in respect of any Anchor Plant and in this context is a Restoration Service Provider.</u>
<u>Anchor DC Converter Test</u>	<u>A test carried out by an Anchor DC Converter Owner at an Anchor DC Converter while the Anchor DC Converter is disconnected from all external electrical power supplies from the Total System.</u>
<u>Anchor Power Station</u>	<u>An Embedded Power Station comprising Anchor Plant.</u>
<u>Anchor Power Station Test</u>	<u>A test carried out by an Anchor Generator at an Anchor Power Station while that Anchor Power Station is disconnected from all external electrical power supplies from the Network Operator's System.</u>
<u>Anchor Generating Unit</u>	<u>An Embedded Generating Unit with Anchor Plant Capability.</u>
<u>Anchor Generating Unit Test</u>	<u>A test carried out on an Anchor Generating Unit or a CCGT unit or a Power Generating Module, as the case may be, at an Anchor Power Station while the Anchor Power Station remains energised from the Network Operator's System.</u>
<u>Anchor HVDC System</u>	<u>An Embedded HVDC System with Anchor Plant Capability.</u>
<u>Anchor HVDC System Owner</u>	<u>A HVDC System owner and/or operator who has a Restoration Service Contract in respect of any Anchor Plant and in this context is a Restoration Service Provider.</u>
<u>Anchor HVDC System Test</u>	<u>A Test carried out by an Anchor HVDC System Owner with an Anchor HVDC System while the Anchor HVDC System is not energised from the Network Operator's System.</u>
<u>Anchor Plant</u>	<u>Anchor Plant is Plant which has an Anchor Plant Capability.</u>

Commented [AMC1]: Comments on this document are included as

- 1.Change tracked text suggested changes
- 2.Individual comments

Some more material comments highlighted in green

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Commented [AMC2]: Shouldn't this align with the definition of an AG ie

A DC Converter owner and/or operator who has a Restoration Service Contract in respect of any Anchor Plant and in this context is a Restoration Service Provider. – AJ Response Agree – text updated

Commented [AMC3]: Is reference to CCGT relevant here? AJ Response – I think so as it covers all plant though I think there may be a conflict here in that OC5 specifically refers to unit tests yet RIG uses the term Module which is an ensemble of units. This may be an issue that requires tweaking to future drafting in OC5.7

Commented [AMC4]: Isn't an Anchor Gen Unit Test is a test on an Anchor Gen Unit (not a Anchor PGM) – AJ Response Yes – see above but not sure how we would test Power Park Modules – I think this needs some tweaking but will need to look at the words used.

Commented [AMC5]: Shouldn't this align with the definition of an AG ie

A HVDC System owner and/or operator who has a Restoration Service Contract in respect of any Anchor Plant and in this context is a Restoration Service Provider. AJ Response – Yes agree – text updated.

Commented [J(A6): Minor change to text to address comment.

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<u>Anchor Plant Capability</u>	<u>Is the ability of a Plant to Start-Up from Shutdown and to energise part of the Network Operator's System forming part of a Distribution Restoration Zone within 8 hours of being instructed to do so, without an external electrical power supply from the Network Operator's System.</u>
<u>Anchor Plant Owner</u>	<u>The owner and/or operator of Anchor Plant who has a Restoration Service Contract and in this context is a Restoration Service Provider.</u>
<u>Anchor Plant Test</u>	<u>A test conducted on an Anchor Plant to confirm it is capable of meeting the requirements of the relevant Distribution Restoration Contract.</u>
Apparatus	Other than in OC8, means all equipment in which electrical conductors are used, supported or of which they may form a part. <u>It includes Users' equipment which imposes Demand on the System.</u> In OC8, it means High Voltage electrical circuits forming part of a System on which Safety Precautions may be applied to allow work and/or testing to be carried out on a System .
<u>Auxiliary Energy Supplies</u>	<u>An electricity supply (which could be derived from an auxiliary diesel engine or auxiliary gas turbine or other source of energy) that is necessary to power the auxiliary and ancillary equipment on which a Power Generating Module or HVDC System or DC Converter or other item of Plant and Apparatus relies for it to be capable of generating Active or Reactive Power and which is generally supplied via a Unit Board or Station Board, or equivalent. Auxiliary Energy Supplies must be able to start without an electrical power supply from outside the Power Station or HVDC System or HVDC Converter or DC Converter Station, or other Restoration Service Providers site, within which it is situated. Auxiliary Energy Supplies do not include the mains-independent light current supplies necessary to operate Critical Tools and Facilities.</u>
<u>Auxiliary Diesel Engine</u>	<u>A diesel engine driving a Power Generating Module or Generating Unit which can supply a Unit Board or Station Board, which can start without an electrical power supply from outside the Power Station within which it is situated.</u>
<u>Auxiliary Gas Turbine</u>	<u>A Gas Turbine Unit, which can supply a Unit Board or Station Board, which can start without an electrical power supply from outside the Power Station within which it is situated.</u>
Black Start Capability	In the case of a Black Start Station , is the ability for at least one of its Gensets to Start-Up from Shutdown and to energise a part of the Total System and be Synchronised to the System upon instruction from The Company , within two hours, without an external electrical power supply <u>from the Total System.</u> In the case of a Black Start HVDC System is the ability of an HVDC System to Start-Up from Shutdown and to energise a part of the Total System and be Synchronised to the System upon instruction from The Company , within two hours, without an external electrical power supply from the <u>GB-Synchronous Area-Total System.</u>
Black Start Contract	An agreement between a Black Start Service Provider and The Company under which the Black Start Service Provider provides Black Start Capability and other associated services:-

Commented [VG7]: Black Start Capability is within 2 hours Anchor Plant Capability is within 8 hours.
Is this difference justifiable? J Response – Yes this is a fundamental part of the design process and assumptions used. The reason is that there is a lot more to prepare at distribution than at Transmission hence the time difference.

Commented [AMC8]: Of what? AJ Response – Text updated
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Commented [AMC9]: I'm confused between this definition and Anchor Generator, Anchor DC Converter Owner and Anchor HVDC System Owner – is this the collective term for all – AJ Response – This is a collective term as it saves in the text having to write Anchor Generator, Anchor HVDC System, Anchor DC Converter etc where we can simply write Anchor Plant Owner.
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Commented [AMC10]: See below

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Commented [AMC11]: Delete – isn't it just Plant which generates? AJ Response – Agree happy with deletion

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Commented [AMC12]: If we're deleting this defined term then check its use in the defined term Auxiliary Energy Supplies definition above – AR Response - Agree

Commented [AMC13]: If we're deleting this defined term then check its use in the defined term Auxiliary Energy Supplies definition – As above. -AJ Response – As above

Commented [AMC14]: See next comment

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Commented [AMC15]: Just checking that if it Total System here, is not also Total System in the parag above AJ Response – Text updated as above.

Black Start HVDC System	An HVDC System or DC Converter Station which are registered, pursuant to the Bilateral Agreement with a User , as having a Black Start Capability .
Black Start HVDC Test	A Black Start Test carried out by an HVDC System Owner or DC Converter Station Owner with a Black Start HVDC System while the Black Start HVDC System is disconnected from all external electrical power supplies from the GB-Synchronous-Area-Total System .
Black Start Service Provider	A Generator with a Black Start Station or an HVDC System Owner or DC Converter Station Owner with a Black Start HVDC System .
Black Start Stations	Power Stations which are registered, pursuant to the Bilateral Agreement with a User , as having a Black Start Capability .
Black Start Station Test	A Black Start Test carried out by a Generator with a Black Start Station while the Black Start Station is disconnected from all external electrical power supplies from the GB-Synchronous-Area-Total System .
Black Start Test	A Black Start Test carried out by a Black Start Service Provider on the instructions of The Company , in order to demonstrate that a Black Start Station or a Black Start HVDC System has a Black Start Capability . For the avoidance of doubt, a Black Start Test could comprise a Black Start Station Test , a Black Start Unit Test or Black Start HVDC Test .
Black Start Unit Test	A Black Start Test carried out on a Generating Unit or a CCGT Unit or a Power Generating Module , as the case may be, at a Black Start Station while the Black Start Station remains connected-to-energised from an external alternating current electrical supply.
Block Loading Capability	The incremental Active Power steps, from no load to Rated MW , which a Generating Unit or Power Generating Module or Power Park Module or HVDC System or DC Converter Station (including Anchor Plant and Plant owned and operated by a Restoration Service Provider) can instantaneously supply without causing it to trip or go outside the Frequency range of 47.5Hz – 52Hz assuming the Plant is initially operating at a nominal System Frequency of 50Hz (or an otherwise agreed Frequency range). – The time between each incremental step shall also be provided.
De-synchronised Island Procedure	Has the meaning set out in OC9.5.4.
De-synchronised Island(s)	Has the meaning set out in OC9.5.1(a).
Distribution Restoration Zone	Part of a Network Operator's System which is capable of being energised by Anchor Plant following a Total System Shutdown or Partial System Shutdown . The Distribution Restoration Zone shall contain Anchor Plant and may also include one or more Restoration Service Providers' Plant and Apparatus .
Distribution Restoration Contract	An agreement between an Anchor Plant Owner or other Restoration Service Provider and The Company and a Network Operator under which the Restoration Service Provider , on instruction, can provide services to energise and/or contribute to the establishment of a Distribution Restoration Zone .

Commented [AMC16]: Delete extra space AJ Response - Agree

Commented [AMC17]: This doesn't look like part of the definition – AJ Response – This is existing text.

Commented [AMC18]: Apparatus? AJ Response – Agree and corrected

Commented [AMC19]: I think we need to check is this is the case – as there are other implications as to which party needs to be involved in the development and construction and operation of an RPZ eg NGET – this would need to be accounted for in the legal text and I suspect the 'Tripartite' contract, depending whether the RSP was connected to the Dx of Tx system.

In addition the DNO may need a contract with NGET to, for example carry out switching, install equipment, provide comms and signals. Who funds NGET investment in such cases?

I'd prefer that a DRZ was limited at this stage to just the DNOs system. AJ Response – I have deleted the last sentence so hopefully this addresses the issue.

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Commented [MA(P20):

We agree that this is a sensible approach at the moment, although we do have a concern that the proposals are too complex. We also agree with the proposal in the Distributed Restart Procurement and Compliance December 2021 report, published by the Distributed Restart project team, that it would make sense to review this position if there are material changes in the associated commercial landscape, for example as the DSO role evolves and there larger numbers potential Anchor Generators or other Restoration Service Providers contracting with DNOs for DNO flexibility.

Generally bilateral agreement are easier to negotiate and would result in more clarity on the roles and responsibilities of each party ie

Between NGESO and the Restoration Service Provider with the duties placed on the DNO to support a DRZP under the Grid Code (as for LJRP's)

Or

Between the DNO and the Restoration Service Provider with the duty placed on the DNO to support the required number of DRZPs as specified by NGESO under the Grid Code?

AJ Response – This needs further discussion and once concluded we can update the definition in the Code.

<u>Distribution Restoration Zone Control System</u>	<u>A mains-independent automatic control and supervisory system which assesses the status and operational conditions of a Network Operator's System and where relevant parts of the Transmission System for the purposes of operating Anchor Plant and Restoration Service Providers' Plant and/or modulating Restoration Service Providers' Demand in addition to operating items of the Network Operator's Plant and Apparatus and relevant Transmission Licensees Plant and Apparatus for the purposes of establishing and operating a Distribution Restoration Zone.</u>
<u>Distribution Restoration Zone Plan</u>	<u>A plan produced under OC9.4.7.5.2 detailing the agreed method and procedure by which a Network Operator or Distribution Restoration Zone Control System will instruct an Anchor Plant Owner to energise part of the Network Operator's System together with other Restoration Service Providers to meet blocks of local Demand so as to form a Power Island.</u> <u>A Distribution Restoration Zone Plan is distinct from and falls outside the provisions of a Local Joint Restoration Plan.</u>
Local Joint Restoration Plan	A plan produced under OC9.4.7.12 <u>OC9.4.7.5.1</u> detailing the agreed method and procedure by which a Black Start Service Provider will energise part of the Total System and meet complementary blocks of local Demand so as to form a Power Island . In Scotland, the plan may also: cover more than one Black Start Service Provider ; including Gensets other than those at a Black Start Station and cover the creation of one or more Power Islands . <u>A Local Joint Restoration Plan, Distribution Restoration Zone Plan is distinct from and falls outside the provisions of a Local Joint Restoration Plan. Distribution Restoration Zone Plan.</u>
Part 1 System Ancillary Services	Ancillary Services which are required for System reasons and which must be provided by Users in accordance with the Connection Conditions <u>or European Connection Conditions</u> . An exhaustive list of Part 1 System Ancillary Services is included in that part of CC.8.1 or ECC.8.1 headed Part 1.
Power Island	<u>Part of the Total System which is disconnected from, and out of Synchronism with, the rest of the Total System containing Generating Unit(s) at one or more Power Stations, and/or HVDC Systems and/or DC Converters, together with complementary local Demand.</u> <u>Gensets at an isolated Power Station, together with complementary local Demand. In Scotland a Power Island may include more than one Power Station.</u>
Quick Resynchronisation Capability	The capability of a Type C or Type D Power Generating Module as defined in ECC.6.3.5.6. For the avoidance of doubt, this requirement <u>is</u> only applies to <u>mandatory for</u> EU Code Generators who own or operate a Type C or Type D Power Generating Module <u>but does not preclude owners of other generation Plant electing to provide the capability.</u>
Quick Resynchronisation Unit Test	A test undertaken on <u>a</u> Generating Unit forming part of a Type C or Type D Power Generating Module as detailed in OC5.7.1, <u>OC5.7.3</u> and OC5.7.4 necessary to determine its ability to demonstrate <u>a</u> Quick Resynchronisation Capability .

Commented [AMC21]: And the NGET system if the DRZ extends to the transmission system..... AJ Response – Text updated.

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Commented [AMC22]: And the NGET system if the DRZ extends to the transmission system..... AJ Response – Text updated

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Commented [MA(P23)]:

As drafted an LJRP should be independent of a DRZP. We agree that only one plan could be activated at any one time, however it is not clear why a DRZP and a LJRP couldn't be in place for the same part of the network. Our existing LJRP's include a significant number of GSPs, so requiring independence between a LJRP and DRZP would restrict the number of potential DRZP. In a black start scenario having a wider range of options that can be implemented is probably beneficial. AJ Response - It is important that a DRZP is separate from an LJRP but it does not prohibit having an LJRP and DRZP co-existing side by side. One for discussion but I do not think this affects the text.

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Commented [AMC24]: Delete 'is' AJ Response - Agree

Commented [AMC25]:

How about:

Generating Unit(s) at one or more **Power Stations**, and/or **HVDC Systems** and/or **DC Converters**, together with complementary local **Demand**, connected to a section of the **System** that is disconnected from, and out of **Synchronism** with, the rest of the **Total System**.

Or, to make the island the subject:

Part of the **Total System** which is disconnected from, and out of **Synchronism** with, the rest of the **Total System** containing **Generating Unit(s)** at one or more **Power Stations**, and/or **HVDC Systems** and/or **DC Converters**, together with complementary local **Demand**.

AJ Response – Agree – Have adopted the second suggestion.

Restoration Service Provider	<p><u>A User with a legal or contractual obligation to provide a service contributing to one or several measures of the System Restoration Plan or a party with a contract to meet one or more measures of the System Restoration Plan.</u></p> <p><u>For the avoidance of doubt this shall include any party contributing to either a Local Joint Restoration Plan or a Distribution Restoration Zone Plan.</u></p>
Shutdown	<p>In the case of a Generating Unit is the condition of a Generating Unit where the generator rotor is at rest or on barring:</p> <p><u>. or equivalent.</u></p> <p><u>In the case of an HVDC System or DC Converter Station, is the condition of an HVDC System or DC Converter Station where the HVDC System or DC Converter Station is de-energisedenergized and therefore not importing or exporting Apparent Power to or from the Total System.</u></p> <p><u>In the case of Auxiliaries, the state where they are de-energized and not capable of fulfilling their function until restarted or resupplied.</u></p>
Target Frequency	<p>That Frequency determined by The Company, in its reasonable opinion, as the desired operating Frequency of the Total System <u>or of a relevant Power Island.</u> This will normally be 50.00Hz plus or minus 0.05Hz, except in exceptional circumstances as determined by The Company, in its reasonable opinion, when this may be 49.90 or 50.10Hz. An example of exceptional circumstances may be difficulties caused in operating the System during disputes affecting fuel supplies: <u>or following a Total Shutdown or Partial Shutdown where Power Islands are established, and each Power Island has its own unique Frequency.</u></p>

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Commented [AMC26]: Although not all parties eg the DNO contributes to a DRZP but is not a RSP. AJ Response – I have fully amended the wording here to ensure consistency with GC0148

Needs tweaking.

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Extracts from Planning Code

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

Commented [AMC27]: Delete space AJ Response - Agree

PC.A.5.7 Black Start Related Information (excluding **Distribution Restoration Zone** information formulated as part of a **Distribution Restoration Zone Plan**)

Data relating to **Anchor Plant** and **Plant** and **Apparatus** owned and/or operated by **Restoration Service Providers**, as well as data relating to **Restoration Service Providers' Demand**, forming part of a **Distribution Restoration Zone**, should be supplied in accordance with the requirements of PC.A.5.6.

Commented [AMC28]: Doesn't this section intended to capture info re power stations that are not included in a JLRP – its intended to collect information about other non BS Power Stations.

Was this AF's point?

AJ Response – Agree – As part of the ESRS work we will need to update this section. What we want here is information from Generators in respect of the how quick ly they can get up and running once power supplies have been restored following a System Shutdown.

Commented [AMC29]: Full stop AJ Response – Agree and corrected.

Data identified under this section PC.A.5.7 must be submitted as required under PC.A.1.2. This information may also be requested by **The Company** during a **Black Start** and should be provided by **Generators**, **HVDC System Owners** and **DC Converter Station Owners** where reasonably possible. For the avoidance of doubt, **Generators** in this section PC.A.5.7 means **Generators** only in respect of their **Large Power Stations**.

The following data items/text must be supplied, ~~from~~**by** each **Generator**, ~~and~~ **HVDC System Converter Station Owner** ~~to~~ **The Company**. In the case of **Generators**, the data supplied should ~~be with~~**be with** respect to each **BM Unit** at a **Large Power Station**. For the avoidance of doubt, the data required under PC.A.5.7 (a) and (b) below, does i) not need to be supplied in respect of **Generators** that are contracted to provide a **Black Start Capability** and ii), the data only needs to be supplied in respect of the **BM Unit** at a **Large Power Station** and does not need to include **Generating Unit** data;

- (a) ~~Expected~~**The expected** time for each **BM Unit** to be **Synchronised** following a **Total Shutdown** or **Partial Shutdown**. The assessment should include the **Power Station's** or **HVDC System's** or **DC Converter Station's** ability to re-synchronise all **BM Units**, if all were running immediately prior to the **Total Shutdown** or **Partial Shutdown**. Additionally, this should highlight any specific issues (i.e. those that would impact on the **BM Unit's** time to be **Synchronised**) that may arise, as time progresses without external supplies being restored.
- (b) **Block Loading Capability**. This should be provided in either graphical or tabular format showing the estimated block loading capability from 0MW to **Registered Capacity**. Any particular ~~'hold'~~**Active Power** loading points ~~at which the BM Unit should be operated until further changes in output can be accommodated~~ should also be identified. The data of each **BM Unit** should be provided for the condition of a **Generating Unit** (which is considered as both a 'hot' unit ~~and cold unit~~**(operating prior to the Shutdown) and cold unit (not operated for 48 hours or more prior to the Shutdown)**) that was **Synchronised** just prior to the **Total Shutdown** or **Partial Shutdown**. In the case of an **HVDC System** or **DC Converter Station**, data should be provided ~~when the HVDC System or DC Converter Station has been considered to have operated~~**run immediately prior to before** the **Total Shutdown** or **Partial Shutdown** and equally when the **HVDC System** or **DC Converter Station** has been considered to have been **Shutdown** for a period of 48 hours or more. The block loading assessment should be done against a frequency variation of 49.5Hz – 50.5Hz.

Commented [AMC30]: Comma – AJ Response – Agree and corrected

Commented [AMC31]: Delete AJ response – Agree and corrected.

Commented [AMC32]: delete(AJ Response – Agree and corrected

Commented [AMC33]: operating? AJ Response – Updated as suggested

Commented [AMC34]: ...run immediately prior...

Consistency with below – AJ Response – **Not sure I follow this – I think it would be better to leave as is as we then have a time frame of 48 hours.**

Commented [AMC35]: Operated – AJ Response – agreed and corrected

Commented [AMC36]: ..prior...
Consistency with above AJ Response – This is existing text but AJ Response – Corrected

PC.A.5.8 Distributed Restoration Zone Related Information (excluding Black Start information formulated as part of a Local Joint Restoration Plan))

Data identified under this section PC.A.5.8 ~~must~~**shall** be submitted as required under PC.A.1.2 ~~by Restoration Service Providers party to a Distribution Restoration Zone Plan to the relevant Network Operator annually so that the Network Operator can provide this information to The Company as required under PC.A.1.2. This information may also be requested by The Company during Black Start and should be provided by Network Operators where reasonably practicable. Restoration Service Providers party to a Distribution Restoration Zone Plan shall, where reasonably practicable, submit the relevant information to the Network Operator who shall then supply the relevant information to The Company.~~

Where a **Network Operator** has a **Distribution Restoration Zone Plan** in place for future use the following data items/text shall be supplied, by each **Network Operator** in Week 24 in respect of each **Distribution Restoration Zone**.

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Commented [MA(P37):

It would be worth considering the purpose of this data and whether there is a need for it to be reported annually and also whether it is required by NGENSO. It may be required so that NGENSO can make an assessment of whether the generator and network conditions are such that the DRZP can be selected in the event of a black start.

AJ Response – Yes I think it should be submitted in Week 24 which would be an Annual return. I have added this into the text. We may need to extend this during a Restoration Phase but we can add this into future iterations of the text. Additionally I have added a separate section to this as it may be that not all DNO's have a DRZP in place. I think this will then address the concern.

- (a) The expected time for each **Anchor Plant Owner** and **Restoration Service Provider's Plant** to be **Synchronised** following a **Total Shutdown** or **Partial Shutdown**. The assessment should include the **Anchor Plant Owner's** and **Restoration Service Provider's** ability to re-synchronise all their **Plant**, if all were running immediately prior to the **Total Shutdown** or **Partial Shutdown**. Additionally, the data and supporting text should highlight any specific issues (eg those that would affect the time before which the **Anchor Plant** and **Restoration Service Provider's Plant** could be **Synchronised**) that may arise as time progresses from **Shutdown** without external supplies being restored.
- (b) **Block Loading Capability**. This should be provided in either graphical or tabular format showing the estimated **Block Loading Capability** from OMW to **Registered Capacity** or **Maximum Capacity** as the case may be. Any particular **Active Power** loading points at which the **Anchor Plant** or **Restoration Service Provider's Plant** should be operated until further changes in output can be accommodated should also be identified. The data of each **Anchor Plant** and **Restoration Service Provider's Plant** forming part of a **Distribution Restoration Zone** should be provided for the conditions of the **Anchor Plant** or **Restoration Service Provider's Plant** both as 'hot' units (operating immediately prior to, and at the point of, **Shutdown**) and cold units (not operated for 48 hours or more prior to **Shutdown**). In the case of an **Anchor HVDC System** or **Anchor DC Converter**, data should be provided when the **HVDC System** or **DC Converter** has been operated immediately prior to **Total Shutdown** or **Partial Shutdown** and also when the **Embedded HVDC System** or **Embedded DC Converter** has been considered to have been **Shutdown** for a period of 48 hours or more. The block loading assessment should be done against a frequency variation of 49.5Hz – 50.5Hz assuming the **Plant** is initially operating at a nominal **System Frequency** of 50Hz.

Commented [AMC38]: Is this relevant for Distribution Connected Plant in a DRZ?
Suggest delete – AJ Response – I did not follow this – Need to discuss as a plant could be operating between **OMW and Maximum Capacity or Registered Capacity**.

Commented [AMC39]: ..prior to AJ response – Agreed and updated

Extracts from Connection Conditions

CC.3 SCOPE

CC.3.1 The **CC** applies to **The Company** and to **GB Code Users**, which in the **CC** means:

- (a) **GB Generators** (other than those which only have **Embedded Small Power Stations**), including those undertaking **OTSDUW**;
- (b) **Network Operators**;
- (c) **Non-Embedded Customers**
- (d) **DC Converter Station** owners; and
- (e) **BM Participants** and **Externally Interconnected System Operators** in respect of CC.6.5 only.
- (f) **Restoration Service Providers** other than any already included in (a) to (e) above who are party to a **Distribution Restoration Zone Plan** who provide services in respect of CC.8.1

Commented [AMC40]: above we've used the 'party concept'
How about:

Restoration Service Providers other than any already included in (a) to (e) above who are party to a **Distribution Restoration Zone Plan** who provide services in respect of CC.8.1 – AJ Response – Yes happy with this and included in text

Commented [MA(P41):

As per previous comments:

We agree that this is a sensible approach at the moment, although we do have a concern that the proposals are too complex. We also agree with the proposal in the Distributed Restart Procurement and Compliance December 2021 report, published by the Distributed Restart project team, that it would make sense to review these arrangements if there are material changes in the associated commercial landscape, for example as the DSO role evolves and there larger numbers potential Anchor Generators or other Restoration Service Providers contracting with DNOs for DNO flexibility.

Generally bilateral agreement are easier to negotiate and would result in more clarity on the roles and responsibilities of each party ie

Between NGESO and the Restoration Service Provider with the duties placed on the DNO to support a DRZP under the Grid Code (as for LJRP)

Or
Between the DNO and the Restoration Service Provider with the duty placed on the DNO to support the required number of DRZPs as specified by NGESO under the Grid Code? AJ Response – **This is down to markets and funding and requires further consideration.**

CC.6.3.5 It is an essential requirement that the **National Electricity Transmission System** must ~~incorporate-abe able to undertake~~ **Black Start Capability**. This will be achieved by agreeing a **Black Start Capability** with a number of strategically located ~~Black-Start~~**Restoration Service Providers**. ~~For each-Black-Start In the case of Restoration Service ProviderProviders~~ who are party to a **Distribution Restoration Zone Plan**, ~~The Company will stateshall agree the requirements with the relevant Network Operator and Restoration Service Providers in the Bilateral Agreement whether or not a Black Start Capability is required-a Distribution Restoration Contract.~~

CC.8 ANCILLARY SERVICES

CC.8.1 System Ancillary Services

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

Commented [AMC42]: Contains AJ Response - Agree

- (a) **GB Generators** in respect of **Large Power Stations** are obliged to provide (except **GB Generators** in respect of **Large Power Stations** which have a **Registered Capacity** of less than 50MW and comprise **Power Park Modules**); and,
- (b) **GB Generators** in respect of **Large Power Stations** with a **Registered Capacity** of less than 50MW and comprise **Power Park Modules** are obliged to provide in respect of **Reactive Power** only; and,
- (c) **DC Converter Station** owners are obliged to have the capability to supply; and

- (d) **GB Generators** in respect of **Medium Power Stations** (except **Embedded Medium Power Stations**) are obliged to provide in respect of **Reactive Power** only;

and Part 2 lists the **System Ancillary Services** which **GB Generators or Restoration Service Providers** will provide only if agreement to provide them is reached with **The Company**; (and the **Network Operator** in the case where a **Restoration Service Provider** is party to a **Distribution Restoration Zone Plan**).

Part 1

- (a) **Reactive Power** supplied (in accordance with CC.6.3.2) otherwise than by means of synchronous or static compensators (except in the case of a **Power Park Module** where synchronous or static compensators within the **Power Park Module** may be used to provide **Reactive Power**)
- (b) **Frequency Control** by means of **Frequency** sensitive generation - CC.6.3.7 and BC3.5.1

Part 2

- (c) **Frequency Control** by means of **Fast Start** - CC.6.3.14
- (d) **Black Start Capability** - CC.6.3.5
- (e) **System to Generator Operational Intertipping**
- (f) **Services provided by Restoration Service Providers.**

CC.8.2 Commercial Ancillary Services

Other **Ancillary Services** are also utilised by **The Company** in operating the **Total System** if these have been agreed to be provided by a **GB Code User** (or other person) under an **Ancillary Services Agreement** or under a **Bilateral Agreement**, with payment being dealt with under an **Ancillary Services Agreement** or in the case of **Externally Interconnected System Operators** or **Interconnector Users**, under any other agreement (and in the case of **Externally Interconnected System Operators** and **Interconnector Users** includes ancillary services equivalent to or similar to **System Ancillary Services**) ("**Commercial Ancillary Services**"). The capability for these **Commercial Ancillary Services** is set out in the relevant **Ancillary Services Agreement** or **Bilateral Agreement** (as the case may be).

Extracts from European Connection Conditions

ECC.3 SCOPE

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

- (a) **EU Generators** (other than those which only have **Embedded Small Power Stations**), including those undertaking **OTSDUW** including **Power Generating Modules**, and **DC Connected Power Park Modules**. For the avoidance of doubt, **Electricity Storage Modules** are included within the definition of **Power Generating Modules** for which the requirements of the **ECC** would be equally applicable.

- (b) **Network Operators** but only in respect of:-

- (i) **Network Operators** who are **EU Code Users**;
 - (ii) **Network Operators** who only have **EU Grid Supply Points**;
 - (iii) **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** as provided for in ECC.3.2, ECC.3.3, EC3.4, EC3.5, ECC5.1, ECC.6.4.4 and ECA.3.4;
 - (iv) Notwithstanding the requirements of ECC3.1(b)(i)(ii) and (iii), **Network Operators** who own and/or operate **EU Grid Supply Points**, are only required to satisfy the requirements of this **ECC** in relation to each **EU Grid Supply Point**. **Network Operators** in respect of all other **Grid Supply Points** should continue to satisfy the requirements as specified in the **CCs**.
- (c) **Non-Embedded Customers** who are also **EU Code Users**;
- (d) **HVDC System Owners** who are also **EU Code Users**; and
- (e) **BM Participants** and **Externally Interconnected System Operators** who are also **EU Code Users** in respect of ECC.6.5 only.

(f) **Restoration Service Providers** other than any already included in (a) to (e) above who provide services in respect of ECC.6.3.5 and ECC.8 in relation to **Distribution Restoration Zones** only

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ECC.6.3.5 BLACK START

ECC.6.3.5.1 **Black Start Capability** is not a mandatory requirement, however **EU Code Users**, or **Restoration Service Providers**, may wish to notify **The Company** of their ability to provide a **Black Start** facility and the cost of the service. **The Company** will then consider whether it wishes to contract with the **EU Code User** for the provision of a **Black Start** service which would be specified via a **Black Start Contract**, or or, in conjunction with the **Network Operator**, a **Distribution Restoration Contract**. Where an **EU Code User** does not offer to provide a cost for the provision of a **Black Start Capability**, **The Company** may make such a request if it considers **System** security to be at risk due to a lack of **Black Start** capability.

Commented [AMC45]: By definition a RSP would have already shared is info with NGESO wouldn't it? AJ Response – Not necessarily – this is also an extract from RfG Art 15(5). It is useful to have this statement in especially for new entrants.

ECC.6.3.5.2 It is an essential requirement that ~~the **National Electricity Transmission System**~~ **The Company** must ~~incorporate-abe able to undertake~~ **Black Start Capability**. This will be achieved by agreeing a **Black Start Capability** at a number of strategically located **Power Stations** and **HVDC Systems**. For each **Power Station** or **HVDC System**, **The Company** will state in the **Bilateral Agreement** whether or not a **Black Start Capability** is required. In the case of **Restoration Service Providers** who are party to a **Distribution Restoration Zone Plan**, **The Company** shall agree the requirements with the relevant **Network Operator** and **Restoration Service Providers** in a **Distribution Restoration Contract**.

Commented [AMC46]: Does this only apply to a transmission connected power station/CUSC party. NGESO wouldn't approach a (small) embedded generator directly would they? AJ Response – It only applies to CUSC Parties so far as the Grid Code is written but under RfG it applies to all C and D Plant which requires a change to the D Code – RfG requires this statement – See Art 15(5)(a)(ii)

ECC.6.3.5.3 Where an **EU Code User** has entered into a **Black Start Contract** to provide a **Black Start Capability** or a **Distribution Restoration Contract** to provide **Anchor Plant Capability** in respect of a **Type C Power Generating Module** or **Type D Power Generating Module** (including **DC Connected Power Park Modules**) the following requirements shall apply.

- (i) The **Power-Generating Module** or **DC Connected Power Park Module** shall be capable of starting from shutdown without any external electrical energy supply within a time frame ~~specified by~~agreed with **The Company** in the **Black Start Contract** ~~or, agreed with The Company and the Network Operator in a Distribution Restoration Contract.~~
- (ii) Each **Power Generating Module** or **DC Connected Power Park Module** shall be able to synchronise within the frequency limits defined in ECC.6.1. and, where applicable, voltage limits specified in ECC.6.1.4;
- (iii) The **Power Generating Module** or **DC Connected Power Park Module** shall be capable of ~~connecting on to~~energising an -unenergised part of the System.
- (iv) The **Power-Generating Module** or **DC Connected Power Park Module** shall be capable of automatically regulating dips in voltage caused by connection of demand;
- (v) The **Power Generating Module** ~~or~~ **DC Connected Power Park Module** shall:
 - o ~~_____~~ be capable of **Block Load**Loading Capability,
 - o ~~_____~~ be capable of operating in **LFSM-O** and **LFSM-U**, as specified in ECC.6.3.7.1 and ECC.6.3.7.2;
 - o control **Frequency** in case of overfrequency and underfrequency within the whole **Active Power** output range between the **Minimum Regulating Level** and **Maximum Capacity** as well as at houseload operation ~~levels~~and
 - o be capable of parallel operation ~~of a few~~together with other **Power Generating Modules** including **DC Connected Power Park Modules** within an isolated part of the **Total System** that is still supplying **Customers**, and ~~control~~controlling voltage automatically during the system restoration phase;

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Commented [AMC48]: semicolon and AJ Response - Added

ECC.6.3.5.4 Each **HVDC System** or **Remote End HVDC Converter Station** which has a **Black Start Capability** shall be capable of energising the busbar of an AC substation to which ~~the~~ another **HVDC Converter Station** is connected. The timeframe after shutdown of the **HVDC System** prior to energisation of the AC substation shall be pursuant to the terms of the **Black Start Contract**. ~~The HVDC System~~ shall be able to synchronise within the **Frequency** limits defined in ECC.6.1.2.1.2 and voltage limits defined in ECC.6.1.4.1 unless otherwise specified in the **Black Start Contract**. ~~Wider Frequency~~ and voltage ranges can be specified in the **Black Start Contract** in order to restore **System** security.

ECC.6.3.5.5 With regard to the capability to take part in operation of an isolated part of the **Total System** that is still supplying **Customers**:

- i. ~~(b)~~**Power Generating Modules** including **DC Connected Power Park Modules** shall be capable of taking part in island operation if specified ~~in the Black Start Contract required by The Company and;~~
- ii. ~~_____~~ the **Frequency** limits for island operation shall be those specified in ECC.6.1.2.;
- iii. ~~_____~~ the voltage limits for island operation shall be those defined in ECC.6.1.4;
- iv. **Power Generating Modules** including **DC Connected Power Park Modules** shall be able to operate in **Frequency Sensitive Mode** during island operation, as specified in ECC.6.3.7.3. In the event of a power surplus, **Power Generating Modules** including **DC Connected Power Park Modules** shall be capable of reducing the **Active Power** output from a previous operating point to any new operating point within the **Power Generating Module Performance Chart**. **Power Generating Modules** including **DC Connected Power Park Modules** shall be capable of reducing **Active Power** output as much as inherently technically feasible, but to at least 55 % of **Maximum Capacity**;

- v. ~~(iii)~~ The method for detecting a change from interconnected system operation to island operation shall be agreed between the **EU Generator, The Company** ~~and the Relevant Transmission Licensee~~. The agreed method of detection must not rely solely on **The Company, Relevant Transmission Licensee's** ~~or Network Operators~~ switchgear position signals; anc
- vi. ~~(iv)~~ **Power Generating Modules** including **DC Connected Power Park Modules** shall be able to operate in **LFSM-O** and **LFSM-U** during island operation, as specified in ECC.6.3.7.1 and ECC.6.3.7.2.

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ECC.6.3.5.6

With regard to quick re-synchronisation capability:

- (bi) In case of disconnection of the **Power Generating Module** including **DC Connected Power Park Modules** from the **System**, the **Power Generating Module** shall be capable of quick re-synchronisation in line with the **Protection** strategy agreed between **The Company** and/or **Network Operator** in co-ordination with the **Relevant Transmission Licensee** and the **Generator**;
- (ii) ~~A~~ **Power Generating Module** including a **DC Connected Power Park Module** with a minimum re-synchronisation time greater than 15 minutes after its disconnection from any external power supply must be capable of **Houseload Operation** from any operating point on its **Power Generating Module - Performance Chart**. In this case, the identification of **Houseload Operation** must not be based solely on the **Total System's** switchgear position signals;
- (iii) **Power Generating Modules** including **DC Connected Power Park Modules** shall be capable of ~~Houseload Operation~~, irrespective of any auxiliary connection to the **Total System**. The minimum operation time shall be specified by **The Company**, taking into consideration the specific characteristics of prime mover technology.

Commented [VG49]: Should this be (ii) AJ Response - Yes

Commented [VG50]: Should this be (iii) AJ Response - Yes

ECC.8

ANCILLARY SERVICES

ECC.8.1

System Ancillary Services

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

- (a) **Generators** in respect of **Type C** and **Type D Power Generating Modules** (including **DC Connected Power Park Modules** and **Electricity Storage Modules**) are obliged to provide; and,
- (b) **HVDC System Owners** are obliged to have the capability to supply;
- (c) **EU Generators** in respect of **Medium Power Stations** (except **Embedded Medium Power Stations**) are obliged to provide in respect of **Reactive Power** only:

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and Part 2 lists the **System Ancillary Services** which **EU Generators** ~~or Restoration Service Providers~~ will provide only if agreement to provide them is reached with **The Company**:

Part 1

- (a) **Reactive Power** supplied (in accordance with ECC.6.3.2)
- (b) **Frequency** Control by means of **Frequency** sensitive generation - ECC.6.3.7 and BC3.5.1

Part 2

- (c) **Frequency** Control by means of **Fast Start** - ECC.6.3.14
- (d) **Black Start** ~~Capability~~ - ECC.6.3.5

(e) **System to Generator Operational Intertripping**

(f) Services provided by Restoration Service Providers.

ECC.8.2 Commercial Ancillary Services

Other **Ancillary Services** are also utilised by **The Company** in operating the **Total System** if these have been agreed to be provided by a **User** (or other person) under an **Ancillary Services Agreement** or under a **Bilateral Agreement**, with payment being dealt with under an **Ancillary Services Agreement** or in the case of **Externally Interconnected System Operators** or **Interconnector Users**, under any other agreement (and in the case of **Externally Interconnected System Operators** and **Interconnector Users** includes ancillary services equivalent to or similar to **System Ancillary Services**) ("**Commercial Ancillary Services**"). The capability for these **Commercial Ancillary Services** is set out in the relevant **Ancillary Services Agreement** or **Bilateral Agreement** (as the case may be).

.....
Extracts from Operating Code 5

OC5.1 INTRODUCTION

Operating Code No. 5 ("OC5") specifies the procedures to be followed by **The Company** in carrying out:

- (a) monitoring
 - (i) of **BM Units** against their expected input or output;
 - (ii) of compliance by **Users** with the **CC** or **ECC** as applicable and in the case of response to **Frequency, BC3**; and
 - (iii) of the provision by **Users** of **Ancillary Services** which they are required or have agreed to provide; and
- (b) the following tests (which are subject to **System** conditions prevailing on the day):
 - (i) tests on **Generators, CCGT Modules, Power Generating Modules, Power Park Modules, DC Converters, HVDC Equipment, OTSUA** (prior to the **OTSUA Transfer Time**) and **Generating Units** (excluding **Power Park Units**) to test that they have the capability to comply with the **CC** and **ECC**, and in the case of response to **Frequency, BC3** and to provide the **Ancillary Services** that they are either required or have agreed to provide;
 - (ii) tests on **BM Units**, to ensure that the **BM Units** are available in accordance with their submitted **Export and Import Limits** and **Dynamic Parameters**.

The **OC5** tests specified in **OC5.7** include the procedures relating to Black Start Test procedure Tests and procedures relating to testing Restoration Service Providers' Plant and Apparatus in respect of Distribution Restoration Zones.

OC5 also specifies in **OC5.8** the procedures which apply to the monitoring and testing of **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** and **Embedded DC Converter Stations (or Embedded HVDC Equipment)** not subject to a **Bilateral Agreement**.

In respect of a **Cascade Hydro Scheme** the provisions of **OC5** shall be applied as follows:

- (a) in respect of the **BM Unit** for the **Cascade Hydro Scheme** the parameters referred to at **OC5.4.1 (a)** and (c) in respect of **Commercial Ancillary Services** will be monitored and tested;

- (b) in respect of each **Genset** forming part of the **Cascade Hydro Scheme** the parameters referred to at OC5.4.1 (a), (b) and (c) will be tested and monitored. In respect of OC5.4.1 (a) the performance of the **Gensets** will be tested and monitored against their expected input or output derived from the data submitted under BC1.4.2(a)(2). Where necessary to give effect to the requirements for **Cascade Hydro Schemes** in the following provisions of **OC5** the term **Genset** will be read and construed in the place of **BM Unit**.

In respect of **Embedded Exemptable Large Power Stations** the provisions of **OC5** shall be applied as follows:

- (a) where there is a **BM Unit** registered in the **BSC** in respect of **Generating Units** the provisions of **OC5** shall apply as written;
- (b) in all other cases, in respect of each **Power Generating Module**, and/or **Generating Unit** and **HVDC Equipment** the parameters referred to at OC5.4.1(a), (b) and (c) will be tested and monitored. In respect of OC5.4.1(a) the performance of the **Power Generating Module** and/or **Generating Unit** and **HVDC Equipment** will be tested and monitored against their expected input or output derived from the data submitted under BC1.4.2(a)(2). Where necessary to give effect to the requirements for such **Embedded Exemptable Large Power Stations** in the provisions of **OC5** the term **Generating Unit** will be read and construed in place of **BM Unit**.

OC5.2

OBJECTIVE

The objectives of **OC5** are to establish:

- (a) that **Users** comply with the **CC** or **ECC** as applicable (including in the case of **OTSUA** prior to the **OTSUA Transfer Time**);
- (b) whether **BM Units** operate in accordance with their expected input or output derived from their **Final Physical Notification Data** and agreed **Bid-Offer Acceptances** issued under **BC2**;
- (c) whether each **BM Unit** is available as declared in accordance with its submitted **Export and Import Limits** and **Dynamic Parameters**; and
- (d) whether **Generators**, **DC Converter Station** owners, **HVDC Equipment Owners** and **Suppliers** can provide those **Ancillary Services** which they are either required or have agreed to provide.

In certain limited circumstances as specified in this **OC5** the output of **CCGT Units** may be verified, namely the monitoring of the provision of **Ancillary Services** and the testing of **Reactive Power** and automatic **Frequency Sensitive Operation**.

OC5.3

SCOPE

OC5 applies to **The Company** and to **Users**, which in **OC5** means:

- (a) **Generators** (including those undertaking **OTSDUW**);
- (b) **Network Operators**;
- (c) **Non-Embedded Customers**;
- (d) **Suppliers**; and
- (e) **DC Converter Station** owners or **HVDC Equipment Owners**.

OC5.4

MONITORING

OC5.4.1

Parameters ~~To Be~~ to be monitored

The Company will monitor the performance of:

- (a) **BM Units** against their expected input or output derived from their **Final Physical Notification Data** and agreed **Bid-Offer Acceptances** issued under **BC2**;

- (b) compliance by **Users** with the **CC** or **ECC** as applicable; and
- (c) the provision by **Users** of **Ancillary Services** which they are required or have agreed to provide.

OC5.4.2 Procedure ~~For~~ Monitoring

OC5.4.2.1 In the event that a **BM Unit** fails persistently, in **The Company's** reasonable view, to follow, in any material respect, its expected input or output or a **User** fails persistently to comply with the **CC** or **ECC** as applicable and in the case of response to **Frequency, BC3** or to provide the **Ancillary Services** it is required, or has agreed, to provide, **The Company** shall notify the relevant **User** giving details of the failure and of the monitoring that **The Company** has carried out.

OC5.4.2.2 The relevant **User** will, as soon as possible, provide **The Company** with an explanation of the reasons for the failure and details of the action that it proposes to take to:

- (a) enable the **BM Unit** to meet its expected input or output or to provide the **Ancillary Services** it is required or has agreed to provide, within a reasonable period, or
- (b) in the case of a **Power Generating Module, Generating Unit** (excluding a **Power Park Unit**), **CCGT Module, Power Park Module, OTSUA** (prior to the **OTSUA Transfer Time**), **HVDC Equipment** or **DC Converter** to comply with the **CC** or **ECC** as applicable and in the case of response to **Frequency, BC3** or to provide the **Ancillary Services** it is required or has agreed to provide, within a reasonable period.

OC5.4.2.3 **The Company** and the **User** will then discuss the action the **User** proposes to take and will endeavour to reach agreement as to:

- (a) any short term operational measures necessary to protect other **Users**; and
- (b) the parameters which are to be submitted for the **BM Unit** and the effective date(s) for the application of the agreed parameters.

OC5.4.2.4 In the event that agreement cannot be reached within 10 days of notification of the failure by **The Company** to the **User**, **The Company** or the **User** shall be entitled to require a test, as set out in OC5.5 and OC5.6, to be carried out.

OC5.5 PROCEDURE FOR TESTING

OC5.5.1 The Company's Instruction ~~For~~ Testing

OC5.5.1.1 **The Company** may at any time (although not normally more than twice in any calendar year in respect of any particular **BM Unit**) issue an instruction requiring a **User** to carry out a test, provided **The Company** has reasonable grounds of justification based upon:

- (a) a failure to agree arising from the process in CP.8.1 or ECP.8.1; or
- (b) monitoring carried out in accordance with OC5.4.2.

OC5.5.1.2 The test, referred to in OC5.5.1.1 and carried out at a time no sooner than 48 hours from the time that the instruction was issued, on any one or more of the **User's BM Units** should only be to demonstrate that the relevant **BM Unit**:

- (a) if active in the **Balancing Mechanism**, meets the ability to operate in accordance with its submitted **Export and Import Limits** and **Dynamic Parameters** and achieve its expected input or output which has been monitored under OC5.4; and
- (b) meets the requirements of the paragraphs in the **CC** which are applicable to such **BM Units**; and

in the case of a **BM Unit** comprising a **Generating Unit**, a **CCGT Module**, a **Power Park Module**, a **Power Generating Module**, **HVDC System** or a **DC Converter** meets,

- (c) the requirements for operation in **Frequency Sensitive Mode** and compliance with the requirements for operation in **Limited Frequency Sensitive Mode** in accordance with CC.6.3.3, ECC.6.3.3, CC.6.3.7, ECC.6.3.7, BC3.5.2 and BC3.7.2; or

- (d) the terms of the applicable **Bilateral Agreement** agreed with the **Generator** to have a **Fast Start Capability**; or
- (e) the **Reactive Power** capability registered with **The Company** under **OC2** which shall meet the requirements set out in CC.6.3.2 or ECC.6.3.2 as applicable. In the case of a test on a **Generating Unit** within a **CCGT Module** the instruction need not identify the particular **CCGT Unit** within the **CCGT Module** which is to be tested, but instead may specify that a test is to be carried out on one of the **CCGT Units** within the **CCGT Module**.
- OC5.5.1.3 (a) The instruction referred to in OC5.5.1.1 may only be issued if the relevant **User** has submitted **Export and Import Limits** which notify that the relevant **BM Unit** is available in respect of the **Operational Day** current at the time at which the instruction is issued. The relevant **User** shall then be obliged to submit **Export and Import Limits** with a magnitude greater than zero for that **BM Unit** in respect of the time and the duration that the test is instructed to be carried out, unless that **BM Unit** would not then be available by reason of forced outage or **Planned Outage** expected prior to this instruction.
- (b) In the case of a **CCGT Module** the **Export and Import Limits** data must relate to the same **CCGT Units** which were included in respect of the **Operational Day** current at the time at which the instruction referred to in OC5.5.1.1 is issued and must include, in relation to each of the **CCGT Units** within the **CCGT Module**, details of the various data set out in BC1.A.1.3 and BC1.A.1.5, which parameters **The Company** will utilise in instructing in accordance with this **OC5** in issuing **Bid-Offer Acceptances**. The parameters shall reasonably reflect the true operating characteristics of each **CCGT Unit**.
- (c) The test referred to in OC5.5.1.1 will be initiated by the issue of instructions, which may be accompanied by a **Bid-Offer Acceptance**, under **BC2** (in accordance with the **Export and Import Limits** and **Dynamic Parameters** which have been submitted for the day on which the test was called, or in the case of a **CCGT Unit**, in accordance with the parameters submitted under OC5.5.1.3(b)). The instructions in respect of a **CCGT Unit** within a **CCGT Module** will be in respect of the **CCGT Unit**, as provided in BC2.
- OC5.5.2 User Request For Testing
- OC5.5.2.1 Where a **GB Code User** undertakes a test to demonstrate compliance with the **Grid Code** and **Bilateral Agreement** in accordance with CP.6 or CP.7 or CP.8 (other than a failure between **The Company** and a **GB Code User** to agree in CP.8.1 where OC5.5.1.1 applies) the **GB Code User** shall request permission to test using the process laid out in OC7.5.
- OC5.5.2.2 Where an **EU Code User** undertakes a test to demonstrate compliance with the **Grid Code** and **Bilateral Agreement** in accordance with ECP.6.1, ECP.6.2, ECP.6.3 or ECP.7 or ECP.8 (other than a failure between **The Company** and a **EU Code User** to agree in ECP.8.1 where OC5.5.1.1 applies) the **EU Code User** shall request permission to test using the process laid out in OC7.5.
- OC5.5.3 Conduct Of Test
- OC5.5.3.1 The performance of the **BM Unit** will be recorded at **Transmission Control Centres** notified by **The Company** with monitoring at site when necessary, from voltage and current signals provided by the **User** for each **BM Unit** under CC.6.6.1 or ECC.6.6.1 as applicable.
- OC5.5.3.2 If monitoring at site is undertaken, the performance of the **BM Unit** will be recorded on a suitable recorder (with measurements, in the case of a **Synchronous Generating Unit** (which could be part of a **Synchronous Power Generating Module**), taken on the **Generating Unit** Stator Terminals / on the **LV** side of the generator transformer) or in the case of a **Non-Synchronous Generating Unit** (excluding **Power Park Units**), **Power Generating Module**, **Power Park Module** or **HVDC Equipment** or **DC Converter** at the point of connection (including where the **OTSUA** is operational prior to the **OTSUA Transfer Time**, the **Transmission Interface Point**) in the relevant **User's Control Room**, in the presence of a reasonable number of representatives appointed and authorised by **The Company**. If **The Company** or the **User** requests, monitoring at site will include measurement of the parameters set out in OC5.A.1.2 or OC5.A.1.3 or ECP.A.4.2 or ECP.A.4.3 as appropriate.

OC5.5.3.3 The **User** is responsible for carrying out the test and retains the responsibility for the safety of personnel and plant during the test.

OC5.5.4 Test ~~And~~and Monitoring Assessment

The criteria must be read in conjunction with the full text under the Grid Code reference. The **BM Unit, Power Generating Module, CCGT Module, Power Park Module or Generating Unit** (excluding **Power Park Units**), **HVDC Equipment** and **DC Converters** and **OTSUA** will pass the test -the criteria below are met:

Parameter to be Tested		Criteria against which the test results will be assessed by The Company.
Voltage Quality	Harmonic Content	CC.6.1.5(a) or ECC.6.1.5(a) — Measured harmonic emissions do not exceed the limits specified in the Bilateral Agreement or where no such limits are specified, the relevant planning level specified in Engineering Recommendation G5 .
	Phase Unbalance	CC.6.1.5(b) or ECC.6.1.5(b), The measured maximum Phase (Voltage) Unbalance on the National Electricity Transmission System should remain, in England and Wales, below 1% and, in Scotland, below 2% and Offshore will be defined in relevant Bilateral Agreement . CC.6.1.6 or ECC.6.1.6 In England and Wales, measured infrequent short duration peaks in Phase (Voltage) Unbalance should not exceed the maximum value stated in the Bilateral Agreement .
	Rapid Voltage Change	CC.6.1.7(a) or ECC.6.1.7(a) The measured Rapid Voltage Change — at the Point of Common Coupling shall not exceed the Planning Levels specified in CC.6.1.7(a) or ECC 6.1.7.(i)
	Flicker Severity	CC.6.1.7(j) or ECC.6.1.7(j) The measured Flicker Severity at the Point of Common Coupling shall not exceed the limits specified in the table of CC.6.1.7(j) or ECC 6.1.7(j).
	Voltage Fluctuation	CC.6.1.8 or ECC.6.1.8 Offshore , measured voltage fluctuations at the Point of Common Coupling shall not exceed the limits set out in the Bilateral Agreement .
Fault Clearance	Fault Clearance Times	CC.6.2.2.2(a), CC.6.2.3.1.1(a), ECC.6.2.2.2(a), ECC.6.2.3.1.1(a), Bilateral Agreement
	Back Up Protection	CC.6.2.2.2(b), CC.6.2.3.1.1(b), ECC.6.2.2.2(a), ECC.6.2.3.1.1(a), Bilateral Agreement
	Circuit Breaker Fail Protection	CC.6.2.2.2(c), CC.6.2.3.1.1(c), ECC.6.2.2.2(c), ECC.6.2.3.1.1(c)

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Parameter to be Tested		Criteria against which the test results will be assessed by The Company.
Governor / Frequency Control	Reactive Capability	<p>CC.6.3.2 or ECC.6.3.2 (and in the case of CC.6.3.2(e)(iii) and ECC.6.3.2.5 and ECC.6.3.2.6, the Bilateral Agreement), CC.6.3.4 or ECC.6.3.4, Ancillary Services Agreement.</p> <p>For a test initiated under OC.5.5.1.1 the Power Generating Module, Generating Unit, HVDC Equipment, DC Converter or Power Park Module or (prior to the OTSUA Transfer Time) OTSUA will pass the test if it is within $\pm 5\%$ of the reactive capability registered with The Company under OC2. The duration of the test will be for a period of up to 60 minutes during which period the system voltage at the Grid Entry Point for the relevant Power Generating Module, Generating Unit, HVDC Equipment, DC Converter or Power Park Module or Interface Point in the case of OTSUA will be maintained by the Generator or HVDC System Owner, DC Converter Station owner at the voltage specified pursuant to BC2.8 by adjustment of Reactive Power on the remaining Power Generating Module, Generating Unit, HVDC Equipment, DC Converter or Power Park Modules or OTSUA, if necessary. Any test performed in respect of an Embedded Medium Power Station not subject to a Bilateral Agreement or, an Embedded DC Converter Station or Embedded HVDC System not subject to a Bilateral Agreement shall be as confirmed pursuant to OC5.8.3.</p> <p>Measurements of the Reactive Power output under steady state conditions should be consistent with Grid Code requirements i.e. fully available within the voltage range $\pm 5\%$ at all voltages.</p>
	Primary Secondary and High Frequency Response	<p>Ancillary Services Agreement, CC.6.3.7 and where applicable CC.A.3 or ECC.6.3.7 and where applicable ECC.A.3.</p> <p>For a test initiated under OC.5.5.1.1 the measured response in MW/Hz is within $\pm 5\%$ of the level of response specified in the Ancillary Services Agreement for that Genset.</p>
	Stability with Voltage	CC.6.3.4 or ECC.6.3.4
	Governor / Load / Frequency Controller System Compliance	CC.6.3.6(a), CC.6.3.7, CC.6.3.9, CC.8.1 , where applicable CC.A.3, BC3.5, BC3.6, BC3.7 or ECC.6.3.6, ECC.6.3.7, ECC.6.3.9, ECC8.1, where applicable ECC.A.3, BC3.5, BC3.6, BC3.7
	Output at Reduced System Frequency	CC.6.3.3 or ECC.6.3.3 - For variations in System Frequency exceeding 0.1Hz within a period of less than 10 seconds, the Active Power output is within $\pm 0.2\%$ of the requirements of CC.6.3.3 or ECC.6.3.3 when monitored at prevailing external air temperatures of up to 25°C., BC3.5.1

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Parameter to be Tested		Criteria against which the test results will be assessed by The Company.
	Fast Start	Ancillary Services Agreement requirements
	Black Start	OC5.7
	Excitation/Voltage Control System	CC.6.3.6(b), CC.6.3.8, CC.A.6 or CC.A.7 as applicable, BC2.11.2, and the Bilateral Agreement or ECC.6.3.6, ECC.6.3.8, ECC.A.6 or ECC.A.7 or ECC.A.8 as applicable
	Fault Ride Through and Fast Fault Current Injection	CC.6.3.15, CC.A.4.A or CC.A.4.B as applicable or ECC.6.3.15, ECC.6.3.16, ECC.A.4. or ECC.A.4EC as applicable
Dynamic Parameters	Export and Import Limits, and Dynamic Parameters	BC2 The Export and Import Limits Dynamic Parameters under test are within 2½% of the declared value being tested.
	Synchronisation time	BC2.5.2.3 Synchronisation takes place within ±5 minutes of the time it should have achieved Synchronisation .
	Run-up rates	BC2 Achieves the instructed output and, where applicable, the first and/or second intermediate breakpoints, each within ±3 minutes of the time it should have reached such output and breakpoints from Synchronisation (or break point, as the case may be), calculated from the run-up rates in its Dynamic Parameters .
	Run-down rates	BC2 Achieves the instructed output and, where applicable, the first and/or second intermediate breakpoints, each within ±5 minutes of the time it should have reached such output and breakpoints from Synchronisation (or break point, as the case may be), calculated from the run-up rates in its Dynamic Parameters .
	Demand Response	DRSC.11.7 Non-Embedded Customers and BM Participants who are also Demand Response Providers shall execute a demand modification test when requested as per DRSC.11.7 to ensure the requirements of the Ancillary Services agreement and Demand Response Services Code are satisfied.

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- OC5.5.4.1 The duration of the **Dynamic Parameter** tests in the above table will be consistent with and sufficient to measure the relevant expected input or output derived from the **Final Physical Notification Data** and **Bid-Offer Acceptances** issued under **BC2** which are still in dispute following the procedure in OC5.4.2.
- OC5.5.4.2 Due account will be taken of any conditions on the **System** which may affect the results of the test. The relevant **User** must, if requested, demonstrate, to **The Company's** reasonable satisfaction, the reliability of the suitable recorders, disclosing calibration records to the extent appropriate.
- OC5.5.5 Test Failure / Re-test
- OC5.5.5.1 If the **BM Unit, Power Generating Module, CCGT Modules, Power Park Module, OTSUA**, or **Generating Unit** (excluding **Power Park Units**), **HVDC Equipment** or **DC Converter Station** concerned fails to pass the test instructed by **The Company** under OC5.5.1.1 the **User** must provide **The Company** with a written report specifying in reasonable detail the reasons for any failure of the test so far as they are then known to the **User** after due and careful enquiry. This must be provided within five **Business Days** of the test.
- OC5.5.5.2 If in **The Company's** reasonable opinion the failure to pass the test relates to compliance with the **CC** or **ECC** as applicable then **The Company** may invoke the process detailed in CP.8.2 to CP.9, or ECP.8.2 to ECP.9
- OC5.5.5.3 If a dispute arises relating to the failure, **The Company** and the relevant **User** shall seek to resolve the dispute by discussion, and, if they fail to reach agreement, the **User** may by notice require **The Company** to carry out a re-test on 48 hours' notice which shall be carried out following the procedure set out in OC5.5.3 and OC5.5.4 and subject as provided in OC5.5.1.3, as if **The Company** had issued an instruction at the time of notice from the **User**.
- OC5.5.6 Dispute Following Re-Test
- If the **BM Unit, Power Generating Module, CCGT Module, Power Park Module, OTSUA**, or **Generating Unit** (excluding **Power Park Units**), **HVDC Equipment** or **DC Converter** in **The Company's** view fails to pass the re-test and a dispute arises on that re-test, either party may use the **Disputes Resolution Procedure** for a ruling in relation to the dispute, which ruling shall be binding.
- OC5.6 DISPUTE RESOLUTION
- OC5.6.1 If following the procedure set out in OC5.5 it is accepted that the **BM Unit, Power Generating Module, CCGT Module, Power Park Module, OTSUA** (prior to the **OTSUA Transfer Time**) or **Generating Unit** (excluding **Power Park Units**), **HVDC Equipment** or **DC Converter** has failed the test or re-test (as applicable), the **User** shall within 14 days, or such longer period as **The Company** may reasonably agree, following such failure, submit in writing to **The Company** for approval the date and time by which the **User** shall have brought the **BM Unit** concerned to a condition where it complies with the relevant requirement. **The Company** will not unreasonably withhold or delay its approval of the **User's** proposed date and time submitted. Should **The Company** not approve the **User's** proposed date or time (or any revised proposal), the **User** should amend such proposal having regard to any comments **The Company** may have made and re-submit it for approval.
- OC5.6.2 If a **BM Unit** fails the test, the **User** shall submit revised **Export and Import Limits** and/or **Dynamic Parameters**, or in the case of a **BM Unit** comprising a **Generating Unit, Power Generating Module, CCGT Module, HVDC Equipment, DC Converter, OTSUA** (prior to the **OTSUA Transfer Time**) or **Power Park Module**, the **User** may amend, with **The Company's** approval, the relevant registered parameters of that **Generating Unit, Power Generating Module, CCGT Module, HVDC Equipment, DC Converter, OTSUA** (prior to the **OTSUA Transfer Time**) or **Power Park Module**, as the case may be, relating to the criteria, for the period of time until the **BM Unit** can achieve the parameters previously registered, as demonstrated in a re-test.

OC5.6.3 Once the **User** has indicated to **The Company** the date and time that the **BM Unit, Power Generating Module, CCGT Module, Power Park Module, Generating Unit** (excluding **Power Park Units**) or **OTSUA** (prior to the **OTSUA Transfer Time**), **HVDC Equipment** or **DC Converter Station** can achieve the parameters previously registered or submitted, **The Company** shall either accept this information or require the **User** to demonstrate the restoration of the capability by means of a repetition of the test referred to in OC5.5.3 by an instruction requiring the **User** on 48 hours notice to carry out such a test. The provisions of this OC5.6 will apply to such further test.

OC5.7 BLACK START TESTING

OC5.7.1 General

As provided for in OC9.1.1 there are two ways in which the **Total System** (or disconnected part of the **Total System** in the case of a **Partial Shutdown**) can be re-established. These being a top-down approach using **Local Joint Restoration Plans** or a bottom-up approach using one or more **Distribution Restoration Zone Plans**. In practice, and in order to re-establish the **Total System** to normal operational conditions and restore **User's Demand** in the shortest possible time and in the most reliable way, **The Company** may initiate a top-down and bottom-up approach in parallel.

To achieve this objective, it is essential that **Black Start Service Providers** and **Anchor Plant Owners**, test their **Plant** and **Apparatus** at regular intervals to demonstrate that there is a high level of confidence that they will be able to satisfy the requirements of the Grid Code and their **Black Start Contracts** or their **Distribution Restoration Contracts**.

OC5.7.1.1 General Requirements applicable to Black Start Service Providers forming part of a Local Joint Restoration Plan

- (a) **The Company** shall require a **Black Start Service Provider** to carry out a **Black Start Test** in order to demonstrate that a **Black Start Station** or **Black Start HVDC System** has a **Black Start Capability**.
- (i) In the case of a **Generator**, **The Company** shall require a **Generator** with a **Black Start Station** to carry out a test (either a "**Black Start Unit Test**" or a **Black Start Station Test**) in order to demonstrate that a **Black Start Station** has a **Black Start Capability**.
- (ii) In the case of an **HVDC System Owner** or **DC Converter Station Owner**, **The Company** shall require an **HVDC System Owner** or **DC Converter Station Owner** with a **Black Start HVDC System** to carry out a test (a "**Black Start HVDC Test**") on a **HVDC System** or **DC Converter**, in order to demonstrate that a **Black Start HVDC System** has a **Black Start Capability**.
- (iii) In the case of an **EU Generator**, **The Company** may also require a **Generator** with a **Black Start Station** to carry out a test (a **Quick Resynchronisation Unit Test**) in order to demonstrate that a **Black Start Station** has a **Quick Re-Synchronisation Capability**.

Commented [MA(P52)]: Disconnected AJ Response - Agree

(b) Where **The Company** requires a **Black Start Service Provider** to undertake testing, the following requirements shall apply:-

- (i) Where **The Company** requires a **Generator** with a **Black Start Station** to carry out a **Black Start Unit Test**, on each **Genset**, which has **Black Start Capability**, within such a **Black Start Station**, the **Generator** shall execute such a test -at least once every three years. **The Company** shall not require the **Black Start Unit Test** to be carried out on more than one **Genset** at that **Black Start Station** at the same time, and would not, in the absence of exceptional circumstances, expect any of the other **Gensets** at the **Black Start Station** to be directly affected by the **Black Start Unit Test**.
- (ii) **The Company** may occasionally require the **Generator** to carry out a **Black Start Station Test** at any time (but will not require a **Black Start Station Test** to be carried out more than once in every three calendar years in respect of any particular **Genset** unless it can justify on reasonable grounds the necessity for further tests or unless the further test is a re-test). If successful, this **Black Start Station Test** shall count as a successful **Black Start Unit Test** for the **Genset** used in the test.
- (iii) **The Company** may require the **HVDC System Owner** or **DC Converter Station Owner** to carry out a **Black Start HVDC Test** at any time (but will not require such a test to be carried out more than once in every three calendar years unless it can justify on reasonable grounds the necessity for further tests or unless the further test is a re-test).
- (iv) **The Company** may occasionally require the **EU Generator** to carry out a **Quick Re-Synchronisation Test** at any time, but will generally only be required where the **EU Generator** has made a change to its **Plant** and **Apparatus** which has an impact on its **Houseload Operation** or after two unsuccessful tripping **Events** in the operational environment.

The above tests will be deemed a success where starting from **Shutdown** is achieved within a time frame specified by **The Company** and which may be agreed in the **Black Start Contract**.

(c) **The Company** may require a **Generator** to carry out a **Black Start Unit Test** at any time (but will not require a **Black Start Unit Test** to be carried out more than once in each calendar year in respect of any particular **Genset** unless it can justify on reasonable grounds the necessity for further tests or unless the further test is a re-test).

(d) When **The Company** wishes a **Black Start Service Provider** to carry out a **Black Start Test**, it shall notify the relevant **Black Start Service Provider** at least 7 days prior to the time of the **Black Start Test** with details of the proposed **Black Start Test**.

OC5.7.1.2 General Requirements applicable to Anchor Plant Owners forming part of a Distribution Restoration Zone Plan

- (a) The Company shall require a Network Operator (where a Distribution Restoration Zone Plan has been agreed for future use) in coordination with an Anchor Plant Owner to carry out tests in order to demonstrate that an Anchor Plant has Anchor Plant Capability. Prior to any test taking place, the Network Operator shall ensure its System is appropriately configured to undertake the test.

Commented [MA(P53)]:

Whilst the contact is tripartite, there is an implied hierarchy here with NGESO at the top and the AP owner at the bottom. Given that the agreement is tripartite, should all the parties be 'equal'?

Is the more general GC requirement that the AP capability needs to be tested (every x years) and the three parties to the tripartite agreement (NGESO, DNO and the AP Owner) should mutually agree when the tests should take place.

This 'equal' principle would be applicable in other situations where there is an unnecessary implied hierarchy.

AJ Response – I have changed this to only cover situations where a DRZP is in place. The frequency of testing is below and needs to be consistent with the same requirements as Transmission.

- i. In the case of an **Anchor Generator**, **The Company** shall require a **Network Operator** to instruct an **Anchor Generator** to carry out a test (either an "**Anchor Generating Unit Test**" or an **Anchor Power Station Test**") in order to demonstrate that an **Anchor Power Station** has **Anchor Plant Capability**.
- ii. In the case of an **Anchor HVDC System Owner** or an **Anchor DC Converter Owner**, **The Company** shall require a **Network Operator** to instruct an **Anchor HVDC System Owner** or **Anchor DC Converter Owner** to carry out an **Anchor HVDC Test** or **Anchor DC Converter Test** on a **HVDC System** or **DC Converter** respectively, in order to demonstrate **Anchor Plant Capability**.
- (b) **The Company** shall require the relevant **Network Operator** to instruct an **Anchor Generator** with an **Anchor Power Station** to carry out an **Anchor Generating Unit Test**, on each **Anchor Generating Unit**, within such an **Anchor Power Station**. The test is required to be conducted at least once every three calendar years. **The Company** shall not require the **Network Operator** to instruct an **Anchor Generating Unit Test** to be carried out on more than one **Anchor Generating Unit** at that **Anchor Power Station** at the same time, and would not, in the absence of exceptional circumstances, expect any of the other **Anchor Generating Units** at the **Anchor Power Station** to be directly affected by the **Anchor Generating Unit Test**.
- (c) **The Company** may occasionally require the relevant **Network Operator** to instruct an **Anchor Generator** to carry out an **Anchor Power Station Test** at any time (but will not require an **Anchor Power Station Test** to be carried out more than once in every three calendar years in respect of any particular **Anchor Generating Unit** unless it can reasonably justify the necessity for further tests or unless the further test is a re-test). If successful, this **Anchor Power Station Test** shall count as a successful **Anchor Generating Unit Test** for the **Anchor Generating Unit** used in the test.
- (d) **The Company** may require the **Network Operator** to instruct an **Anchor HVDC System Owner** or **Anchor DC Converter Owner** to carry out an **Anchor HVDC Test** or **Anchor DC Converter Test** at any time (but will not require such a test to be carried out more than once in every three calendar years unless it can reasonably justify the necessity for further tests, unless the further test is a re-test).
- (e) **The Company** may occasionally require a **Network Operator** to instruct an **EU Generator** which is also an **Anchor Generator** to carry out a **Quick Re-Synchronisation Test** at any time, but will generally only be required where such an **Anchor Generator** has made a change to its **Plant** and **Apparatus** which has an impact on its **Houseload Operation** or after two unsuccessful tripping **Events** in the operational environment.
- OC5.7.1.3 The above tests defined in OC5.7.1.2 (b)– (e) will be deemed a success where stable operation is achieved within a time frame which may be specified in the **Distribution Restoration Contract**.
- OC5.7.1.4 **The Company** may require a **Network Operator** to instruct an **Anchor Generator** to carry out an **Anchor Generating Unit Test** at any time (but will not require an **Anchor Generating Unit Test** to be carried out more than once in each calendar year in respect of any particular **Anchor Generating Unit** unless it can reasonably justify the necessity for further tests, unless the further test is a re-test).
- OC5.7.1.5 -When **The Company** instructs a **Network Operator** to instruct an **Anchor Plant Owner** to carry out an **Anchor Plant Test**, the **Network Operator** shall instruct the relevant **Anchor Plant Owner** at least 7 days prior to the time of the **Anchor Plant Test** with details of the required **Anchor Plant Test**.
- OC5.7.2 Procedure for a **Black Start Test** Tests in respect of **Local Joint Restoration Plans** and **Restoration Service Provider Tests** in respect of **Distribution Restoration Zone Plans**

Commented [MA(P54)]: Require, rather than 'instruct' would be more consistent with other clause AJ Response – Updated text.

Commented [MA(P55)]:
Is it clear what this clause requires. NGESO instructing an AP Test in the next 7 days seems unreasonable – is this what's intended?

Would it be better to say that an AP test shall be arranged at a mutually convenient time? If there is an DNO outage required for the test, 3 months will probably be required to plan a pre-arranged outage. AJ Response I do understand the principle of this but as currently drafted it is consistent with OC5.7.1.1 (d) and therefore this needs wider Workgroup discussion noting that a Shutdown could occur at any time.

Commented [AMC56]: This parag is unclear.

Would it be better to say that all three parties should mutually agree when the AP Test should be carried out? I would expect all parties to want more than 7 days between the date of agreeing the test date and the test day. If the test requires network outages then 3 months' notice would be a reasonable time to plan network outages. AJ Response – This is a consistency issue with Transmission Connected Generation. The two need to be the same. One for discussion.

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Commented [VGS7]: Is there a corresponding heading missing here or should this be deleted? AJ Response – There is a heading and subsequent text but this is massaged by the tracked changes. Additional text added to make this clearer.

The following For **Black Start Service Providers**, who own and/or operate **Plant with Black Start Capability** the procedure for **Black Start Tests** will, so far as practicable, be carried out in the following accordance with the applicable requirements and sequence for **Black Start Tests**: defined in OC5.7.2.1 to OC5.7.2.9 and OC5.7.3.

For **Anchor Plant Owners** who own and/or operate **Anchor Plant** forming part of a **Distribution Restoration Zone Plan**, the procedure for **Anchor Plant Tests** is detailed in OC5.7.4. **Anchor Plant Owners** are not required to satisfy the requirements of OC5.7.2.1 to OC5.7.2.9 and OC5.7.3.

OC5.7.2.1

Black Start Unit Tests

- (a) The relevant **Generating Unit** shall be **Synchronised** and **Loaded**;
- (b) All the **Auxiliary Gas Turbines and/or Auxiliary Diesel Engines Energy Supplies** in the **Black Start Station** in which that **Generating Unit** is situated, shall be **Shutdown**.
- (c) The **Generating Unit** shall be **De-Loaded** and **De-Synchronised** and all alternating current electrical supplies to its **Auxiliaries** shall be disconnected.
- (d) The **Auxiliary Gas Turbine(s) or Auxiliary Diesel Engine(s) Energy Supplies** to the relevant **Generating Unit** shall be started, and shall re-energise the **Unit Board** of the relevant **Generating Unit**.
- (e) The **Auxiliaries** of the relevant **Generating Unit** shall be fed by the **Auxiliary Gas Turbine(s) Energy Supplies or Auxiliary Diesel Engine(s)**, via the **Unit Board**, to enable the relevant **Generating Unit** to return to **Synchronous Speed**.
- (f) The relevant **Generating Unit** shall be **Synchronised** to the **System** but not **Loaded**, unless the appropriate instruction has been given by **The Company** under **BC2** which would also be in accordance with the requirements of the **Black Start Contract**.
- (g) In respect of **EU Generators**, the above tests defined in OC5.7.2.1(a) – (e) shall be in accordance with the requirements of ECC.6.3.5.3.

Commented [VG58]: Should this be deleted as it already covered by Auxiliary Energy Supplies (as per OC5.7.2.2) AJ Response – Yes deleted.

OC5.7.2.2

Black Start Station Test

- (a) All **Generating Units** at the **Black Start Station**, other than the **Generating Unit** on which the **Black Start Test** is to be carried out, and all the **Auxiliary Gas Turbines and/or Auxiliary Diesel Engines Energy Supplies** at the **Black Start Station**, shall be **Shutdown**.
- (b) The relevant **Generating Unit** shall be **Synchronised** and **Loaded**.
- (c) The relevant **Generating Unit** shall be **De-Loaded** and **De-Synchronised**.
- (d) All external alternating current electrical supplies to the **Unit Board** of the relevant **Generating Unit**, and to the **Station Board** of the relevant **Black Start Station**, shall be disconnected.
- (e) An **Auxiliary Gas Turbine or Auxiliary Diesel Engine Energy Supplies** at the **Black Start Station** shall be started, and shall re-energise either directly, or via the **Station Board**, the **Unit Board** of the relevant **Generating Unit**.
- (f) The provisions of OC5.7.2.1 (e) and (f) shall thereafter be followed.
- (g) In respect of **EU Generators**, the above tests defined in OC5.7.2.2(a) – (e) shall be in accordance with the requirements of ECC.6.3.5.3.

OC5.7.2.3

Procedure for a Black Start HVDC Test

- a) The **HVDC System** or **DC Converter Station** shall demonstrate its technical capability to energise the busbar of the ~~de-energised~~ disconnected AC substation to which it is connected, within the **GB Synchronous Area** within a timeframe specified by **The Company**. In the case of **HVDC Systems** this shall be in accordance with the requirements of ECC.6.3.5.4. As part of this test, all **Auxiliaries** are required to be derived from within the **HVDC System** or **DC Converter Station**.

- b) The test shall be carried out while the **HVDC System** or **DC Converter Station** starts from **Shutdown**;
- c) The test shall be deemed passed, provided that the following conditions are cumulatively fulfilled:
 - i) The **HVDC System Owner** has demonstrated its **HVDC System** or **DC Converter Station** is able to energise the busbar of the isolated AC-substation to which it is connected within the **GB Synchronous Area**
 - ii) The **HVDC System** or **DC Converter Station** can achieve a stable operating point at an agreed capacity as agreed with **The Company**. ~~The relevant~~ **HVDC System** or **DC Converter Station** can be connected to the **System** but not **Loaded**, unless appropriate instructions are given by **The Company** under **BC2** which would also be in accordance with the requirements of the **Black Start Contract**.
 - iii) In respect of **HVDC Systems** and **Remote End HVDC Converter Stations**, the above tests defined in OC5.7.2.3(a) – (c) shall be in accordance with the requirements of, ECC.6.1.2, ECC.6.1.4, ECC.6.2.2.9.4 and ECC.6.3.5.4.
 - iv) In respect of **DC Converter Stations**, the above tests defined in OC5.7.2.3(a) – (c) shall be in accordance with the requirements of, CC.6.1.2, CC.6.1.3 and CC.6.1.4.

OC5.7.2.4 All **Black Start Tests** shall be carried out at the time specified by **The Company** in the notice given under OC5.7.1 and shall be undertaken in the presence of a reasonable number of representatives appointed and authorised by **The Company**, who shall be given access to all information relevant to the **Black Start Test**.

OC5.7.2.5 Failure of a Black Start Test

A **Black Start Station** or **Black Start HVDC System** shall fail a **Black Start Test** if the **Black Start Test** shows that it does not have a **Black Start Capability** (ie. if the relevant **Generating Unit** or **HVDC System** or **DC Converter** fails to be **Synchronised** to the **System** within two hours of the **Auxiliary ~~Gas Turbine(s) or Auxiliary Diesel Engine(s)~~Energy Supplies** being required to start unless this is part of a **Local Joint Restoration Plan** where the times will be adjusted accordingly).

OC5.7.2.6 If a **Black Start Station** or **Black Start HVDC System** fails to pass a **Black Start Test** the **Black Start Service Provider** must provide **The Company** with a written report specifying in reasonable detail the reasons for any failure of the test so far as they are then known to the **Black Start Service Provider** after due and careful enquiry. This must be provided within five **Business Days** of the test. If a dispute arises relating to the failure, **The Company** and the relevant **Black Start Service ~~Providers~~Provider** shall seek to resolve the dispute by discussion, and if they fail to reach agreement, the **Black Start Service Provider** may require **The Company** to carry out a further **Black Start Test** on 48 hours notice which shall be carried out following the procedure set out in OC5.7.2.1 or OC5.7.2.2 or OC5.7.2.3 as the case may be, as if **The Company** had issued an instruction at the time of notice from the **Black Start Service Provider**.

OC5.7.2.7 If the **Black Start Station** or **Black Start HVDC System** concerned fails to pass the re-test and a dispute arises on that re-test, either party may use the **Disputes Resolution Procedure** for a ruling in relation to the dispute, which ruling shall be binding.

OC5.7.2.8 If following the procedure in OC5.7.2.6 and OC5.7.2.7 it is accepted that the **Black Start Station** or **Black Start HVDC System** has failed the **Black Start Test** (or a re-test carried out under OC5.7.2.5), within 14 days, or such longer period as **The Company** may reasonably agree, following such failure, the relevant **Black Start Service Provider** shall submit to **The Company** in writing for approval, the date and time by which that **Black Start Service Provider** shall have brought that **Black Start Station** or **Black Start HVDC System** to a condition where it has a **Black Start Capability** and would pass the **Black Start Test**, and **The Company** will not unreasonably withhold or delay its approval of the **Black Start Service Provider's** proposed date and time submitted. Should **The Company** not approve the **Black Start Service Provider's** proposed date and time (or any revised proposal) the **Black Start Service Provider** shall revise such proposal having regard to any comments **The Company** may have made and resubmit it for approval.

OC5.7.2.9 Once the **Black Start Service Provider** has indicated to **The Company** that the **Power Station** or **HVDC System** or **DC Converter Station** has a **Black Start Capability**, **The Company** shall either accept this information or require the **Black Start Service Provider** to demonstrate that the relevant **Black Start Station** or **Black Start HVDC System** has its **Black Start Capability** restored, by means of a repetition of the **Black Start Test** referred to in OC5.7.1(d).1 following the same procedure as for the initial **Black Start Test**. The provisions of this OC5.7.2.9 will apply to such test.

OC5.7.4.3 Quick Re-synchronisation Unit Test

(a) The relevant **Generating Unit** shall be **Synchronised** and _____
Loaded;

(b) All the **Auxiliary Gas Turbines and/or Auxiliary Diesel Engines** **Energy Supplies**
in the _____ **Black Start Station** in which that **Generating Unit** is situated, shall
be _____

(c) Shutdown.

(d) The **Generating Unit** shall be tripped to house load.

(e) The relevant **Generating Unit** shall be **Synchronised** to the **System** but not _____
Loaded, unless the appropriate instruction has been given by **The**
Company _____ under **BC2** which would also be in accordance with
the requirements of the _____ **Black Start Contract**.

In respect of **EU Generators**, the above tests defined in OC5.7.2.3(a) – (e) shall be in accordance with the requirements of ECC.6.3.5.6.

OC5.7.4 Procedure for Testing of Plant and Apparatus required by a Distribution Restoration Zone Plan

Restoration Service Provider's Plant and Apparatus will be subject to testing for the contracted services they have agreed to provide as specified in the Distribution Restoration Contract and as required under the Distribution Restoration Zone Plan. Such Plant and Apparatus which forms part of a Distribution Restoration Zone Plan is required to satisfy the requirements of OC5.7.4 only, and not the requirements of OC5.7.2 and OC5.7.3.

All tests shall be instructed and coordinated by the Network Operator. The Network Operator shall inform The Company of the progress and completion of the tests.

All the tests required by OC5.7.4 shall be carried out at the time agreed by The Company, the Network Operator and Restoration Service Provider in the notice periods given under OC5.7.1.5 and shall be undertaken by the Restoration Service Provider in the presence of a reasonable number of representatives appointed by The Company and/or Network Operator, who shall be given access to all information relevant to the each test.

OC5.7.4.1 Anchor Generating Unit Tests

(a) Prior to the test, the **Network Operator** shall reconfigure its **System** as necessary to enable the **Anchor Generating Unit Test** to be completed whilst having due regard for the safety of plant and personnel on its **System**.

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Commented [MA(P59)]: Need to check consistency. Earlier it was the ESO who 'required' the tests and the DNO who instructed them. Is it the ESO co-ordinating the tests or the DNO? AJ Response -Is the DNO but remember the contract with the Restoration Service Provider in the case of Distributed Restoration Zones is trilateral.

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Commented [MA(P60)]: I don't think 7 days notice is reasonable – AJ Response – See above. 3

- (b) The relevant **Anchor Generating Unit** shall be **Synchronised** and **Loaded**.
- (c) All the **Auxiliary Energy Supplies** in the **Anchor Power Station** which relate to the relevant **Anchor Generating Unit**, shall be **Shutdown**.
- (d) The **Anchor Generating Unit** shall be **de-Loaded**, **De-Synchronised** and **Shutdown** and all alternating current electrical supplies to its **Auxiliaries** shall be disconnected.
- (e) The **Auxiliary Energy Supplies** to the relevant **Anchor Generating Unit** shall be made available and shall re-energise the **Unit Board** (or equivalent) of the relevant **Anchor Generating Unit**.
- (f) The **Auxiliaries** of the relevant **Anchor Generating Unit** shall be fed by the **Auxiliary Energy Supplies**, via the **Unit Board** (or equivalent), to enable the relevant **Anchor Generating Unit** to return to a condition when it is ready to synchronise to the **Network Operator's System**.
- (g) The relevant **Anchor Generating Unit** shall be **Synchronised** to the **System** but not **Loaded**, unless the appropriate instruction has been given by **The Company** to the **Network Operator** under **BC2** which would also be in accordance with the requirements of the **Distribution Restoration Contract**.
- (h) **The Company** and **Network Operator** shall agree with the **Anchor Generator** when the test has been completed in accordance with the test requirements of the **Distribution Restoration Zone Plan**.
- (i) In respect of **Anchor Generators** which are **EU Generators**, the above tests defined in OC5.7.4.1(b) – (h) shall be in accordance with the requirements of **ECC.6.3.5**.

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OC5.7.4.2 Anchor Power Station Tests

- (a) Prior to the test, the **Network Operator** shall reconfigure its **System** as necessary to enable the **Anchor Generating Unit Test** to be completed whilst having due regard for the safety of plant and personnel on its **System**.
- (b) All **Anchor Generating Units** at the **Anchor Power Station**, other than the **Anchor Generating Unit** on which the **Anchor Generating Unit Test** is to be carried out, and all the **Auxiliary Energy Supplies** at the **Anchor Power Station**, shall be **Shutdown**.
- (c) The relevant **Anchor Generating Unit** shall be **Synchronised** and **Loaded**.
- (d) The relevant **Anchor Generating Unit** shall be **De-Loaded** and **De-Synchronised**.
- (e) All external alternating current electrical supplies to the **Unit Board** (or equivalent) of the relevant **Anchor Generating Unit**, and to the **Station Board** of the relevant **Anchor Power Station**, shall be disconnected.
- (f) An **Auxiliary Energy Supply** at the **Anchor Power Station** shall be made available and shall re-energise either directly, or via the **Station Board** or the **Unit Board** (or equivalent) of the relevant **Anchor Generating Unit**.
- (g) The provisions of OC5.7.4.1 (e) to (h) shall thereafter be followed.
- (h) **The Company** and **Network Operator** shall agree with the **Anchor Generator** when the test has been completed in accordance with the test requirements of the **Distribution Restoration Zone Plan**.
- (i) In respect of **EU Generators**, the above tests defined in OC5.7.4.2(a) – (h) shall be in accordance with the requirements of **ECC.6.3.5**.

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OC5.7.4.3 Tests on Restoration Service Providers' Plant and Apparatus other than Anchor Plant

- (a) Prior to the test, the **Network Operator** shall reconfigure its **System** as necessary to enable the test of the relevant **Plant** and **Apparatus** to be completed whilst having due regard for the safety of plant and personnel on its **System**.
- (b) The relevant **Plant** and/or **Apparatus** shall be operating normally, ie in the operational state it is anticipated to be in if a **Shutdown** were to occur.

Commented [AMC62]: full stop AJ Response - Agreed

- (c) All the **Auxiliary Energy Supplies** which relate to the relevant **Plant** and/or **Apparatus** shall be **Shutdown**.
- (d) The **Plant** and/or **Equipment** shall be **de-loaded**, **De-Synchronised** and **Shutdown** as appropriate and all alternating current electrical supplies to its **Auxiliaries** shall be disconnected.
- (e) The **Auxiliary Energy Supplies** to the relevant **Plant** and/or **Apparatus** shall be made available and shall re-energise the **Unit Board** (or equivalent) of the relevant **Plant** and/or **Apparatus**.
- (f) The **Auxiliaries** of the relevant **Plant** and/or **Apparatus** shall be fed by the **Auxiliary Energy Supplies**, via the **Unit Board** (or equivalent), to enable the relevant **Plant** and/or **Apparatus** to return to a condition when it is ready to be reconnected and/or **Synchronised** to the **Network Operator's System**.
- (g) Relevant **Plant** shall be **Synchronised** to the **System** but not **Loaded**, unless the appropriate instruction has been given by **The Company** to the **Network Operator** under **BC2** which would also be in accordance with the requirements of the **Distribution Restoration Contract**.
- (h) **The Company** and **Network Operator** shall agree with the **Restoration Service Provider** when the test has been completed in accordance with the test requirements of the **Distribution Restoration Zone Plan**.
- (i) In respect of **Restoration Providers** who are **EU Generators**, the above tests defined in OC5.7.4.3(b) – (h) shall be in accordance with the requirements of ECC.6.3.5.

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OC5.7.4.4 Procedure for an Anchor HVDC System Test or Anchor DC Converter Test

- a) The **Anchor HVDC System's** technical capability or **Anchor DC Converter's** technical capability to energise the busbar of the disconnected AC substation to which it is connected, within a timeframe specified by the **Network Operator**, shall be demonstrated. In the case of **Anchor HVDC Systems** the timeframe shall be in accordance with the requirements of ECC.6.3.5.4. As part of this test, all **Auxiliaries** are required to be derived from within the **Anchor HVDC System** or **Anchor DC Converter**.
- b) The test shall be carried out with the **Anchor HVDC System** or **Anchor DC Converter** starting from **Shutdown** :
- c) The test shall be deemed to have been successfully completed, provided that the following conditions are cumulatively fulfilled:
 - i) The **Anchor HVDC System Owner** or **Anchor DC Converter Owner** has demonstrated its **Anchor HVDC System** or **Anchor DC Converter** is able to energise the busbar of the disconnected AC-substation to which it is connected.
 - ii) The **Anchor HVDC System** or **Anchor DC Converter** can achieve a stable operating point at an agreed capacity as agreed with the **Network Operator**. The **Anchor HVDC System** or **Anchor DC Converter** can be connected to the **Network Operator's System** but not **Loaded**, unless appropriate instructions have been given by **The Company** to the **Network Operator** under **BC2** which would also be in accordance with the requirements of the **Distribution Restoration Contract**.
- d) In respect of **Anchor HVDC Systems**, the above tests defined in OC5.7.4.4(a) – (c) shall be in accordance with the requirements of, ECC.6.1.2, ECC.6.1.4, ECC.6.2.2.9.4 and ECC.6.3.5.4.
- e) In respect of **Anchor DC Converter Stations**, the above tests defined in OC5.7.4.4(a) – (c) shall be in accordance with the requirements of, CC.6.1.2, CC.6.1.3 and CC.6.1.4.

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OC5.7.4.5 Quick Re-synchronisation Unit Test

- (a) The relevant **Anchor Generating Unit** shall be **Synchronised** and **Loaded**:

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- (b) All the **Auxiliary Energy Supplies** in the **Anchor Power Station** in which that **Anchor Generating Unit** is situated, shall be **Shutdown**.
- (c) The **Anchor Generating Unit** shall be tripped to house load.
- (d) The relevant **Anchor Generating Unit** shall be **Synchronised** to the **System** but not **Loaded**, unless the appropriate instruction has been given by **The Company** to the **Network Operator** under **BC2** which would also be in accordance with the requirements of the **Distribution Restoration Zone Plan**.
- (e) **The Company** and **Network Operator** shall agree with the **Restoration Service Provider** when the test has been completed in accordance with the test requirements of the **Distribution Restoration Zone Plan**.

In respect of **EU Generators**, the above tests defined in OC5.7.4.5(a) – (d) shall be in accordance with the requirements of **ECC.6.3.5.6**.

OC5.7.4.6 Distribution Restoration Zone Control System Tests

Where a **Network Operator** uses a **Distribution Restoration Zone Control System** as part of the implementation of a **Distribution Restoration Zone Plan**, the **Network Operator** shall undertake tests to establish the correct functioning of the **Distribution Restoration Zone Control System**. These shall include the following:-

- i) that communications systems maintain correct operation when operating in mains independent mode for at least [24] hours.
- ii) that the **Distribution Restoration Zone Control System** is able to reconfigure the **Network Operator's System** and where required as part of a **Distribution Restoration Zone Plan**, **Transmission Licensee's Plant and Apparatus** in response to the appropriate test or simulated signals etc. This functionality shall be demonstrated as being available for at least [24] hours when operating in mains independent mode.
- iii) that the **Distribution Restoration Zone control Ccontrol Ssystem** is able to instruct **Restoration Service Providers Plant and Apparatus** (including **Anchor Plant**) in response to the appropriate test or simulated signals etc. This functionality shall be demonstrated as being available for at least [24] hours when operating in mains independent mode.

The relevant **Network Operator** should conduct the above tests at least once every three years.

OC5.7.4.7 Test Failures/Re-Tests and Disputes

The relevant **Network Operator** shall:

- (a) ensure that **Restoration Service Providers' Plant and Apparatus** is capable of meeting the requirements of OC5.7.4 and the relevant **Distribution Restoration Contracts**.
- (b) notify **The Company** where any such failure has an impact on the **Network Operators** ability to activate a **Distributed Restoration Zone Plan**.
- (c) liaise with **The Company** to allow **The Company** to work with the **Restoration Service Provider** to undertake tests or investigations where there has been a repeated failure of the **Restoration Service Provider's Plant and Apparatus**.

Commented [AMC63]: An example of another aspect that would need to be considered if the DRZC controlled NGET assets

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OC5.8 PROCEDURES APPLYING TO EMBEDDED MEDIUM POWER STATIONS NOT SUBJECT TO A BILATERAL AGREEMENT AND EMBEDDED DC CONVERTER STATIONS NOT SUBJECT TO A BILATERAL AGREEMENT

OC5.8.1 Compliance Statement

Each **Network Operator** shall ensure that each **Embedded Person** provides to the **Network Operator** upon **The Company's** request:

- (a) written confirmation that each such **Power Generating Module, Generating Unit, Power Park Module, HVDC Equipment, or DC Converter** complies with the requirements of the **CC**; and
- (b) evidence, where requested, reasonably satisfactory to **The Company**, of such compliance. Such a request shall not normally be made by **The Company** more than twice in any calendar year in respect of any **Generator's Power Generating Module, Generating Unit or Power Park Module or HVDC System Owner's HVDC System, or DC Converter owner's DC Converter**.

The **Network Operator** shall provide the evidence or written confirmation required under OC5.8.1 (a) and (b) forthwith upon receipt to **The Company**.

OC5.8.2 Network Operator's Obligations To Facilitate Tests

If:

- (a) the **Network Operator** fails to procure the confirmation referred to at OC5.8.1(a); or
- (b) the evidence of compliance is not to **The Company's** reasonable satisfaction,

then, **The Company** shall be entitled to require the **Network Operator** to procure access upon terms reasonably satisfactory to **The Company** to enable **The Company** to witness the **Embedded Person** carrying out the tests referred to in OC5.8.3 in respect of the relevant **Embedded Medium Power Station or Embedded DC Converter Station or Embedded HVDC System**.

OC5.8.3 Testing Of Embedded Medium Power Stations Not Subject To A Bilateral Agreement Or Embedded DC Converter Stations Not Subject To A Bilateral Agreement or Embedded HVDC Equipment Not Subject To A Bilateral Agreement

The Company may, in accordance with the provisions of OC5.8.2, at any time (although not normally more than twice in any calendar year in respect of any particular **Embedded Medium Power Station** not subject to a **Bilateral Agreement** or **Embedded DC Converter Station** or **Embedded HVDC Equipment** not subject to a **Bilateral Agreement**) issue an instruction requiring the **Network Operator** within whose **System** the relevant **Medium Power Station** not subject to a **Bilateral Agreement** or **DC Converter Station** or **HVDC Equipment** not subject to a **Bilateral Agreement** is **Embedded**, to require the **Embedded Person** to carry out a test.

Such test shall be carried out at a time no sooner than 48 hours from the time that the instruction was issued, on any one or more of the **Generating Units, Power Generating Module, Power Park Module or DC Converter or HVDC Equipment** comprising part of the relevant **Embedded Medium Power Station or Embedded DC Converter Station or HVDC System** and should only be to demonstrate that:

- (a) the relevant **Generating Unit, Power Generating Module, Power Park Module or DC Converter or HVDC Equipment** meets the requirements of the paragraphs in the **CC** or **ECC** which are applicable to such **Generating Units, Power Generating Modules, Power Park Module or DC Converter or HVDC Equipment**;
- (b) the **Reactive Power** capability registered with **The Company** under **OC2** meets the requirements set out in **CC.6.3.2** or **ECC.6.3.2** as applicable.

The instruction may only be issued where, following consultation with the relevant **Network Operator, The Company** has:

- (a) confirmed to the relevant **Network Operator** the manner in which the test will be conducted, which shall be consistent with the principles established in OC5.5.3; and
- (b) received confirmation from the relevant **Network Operator** that the relevant **Generating Unit, Power Generating Module, Power Park Module or DC Converter or HVDC Equipment** would not then be unavailable by reason of forced outage or **Planned Outage** expected prior to the instruction.

The relevant **Network Operator** is responsible for ensuring the performance of any test so required by **The Company** and the **Network Operator** shall ensure that the **Embedded Person** retains the responsibility for ensuring the safety of personnel and plant during the test.

OC5.8.4

Test Failures/Re-Tests ~~Andand~~ Disputes

The relevant **Network Operator** shall:

- (a) ensure that provisions equivalent to OC5.5.5, OC5.5.6 and OC5.6 apply to **Embedded Medium Power Stations** not the subject of a **Bilateral Agreement**, **Embedded DC Converter Stations** not the subject of a **Bilateral Agreement** or **Embedded HVDC Equipment** not the subject of a **Bilateral Agreement** within its **System** in respect of test failures, re-tests and disputes as to test failures and re-tests;
- (b) ensure that the provisions equivalent to OC5.5.5, OC5.5.6 and OC5.6 referred to in OC5.8.4(a) are effective so that **The Company** may require, if it so wishes, the provision to it of any reports or other information equivalent to those or that to which **The Company** would be entitled in relation to test failures, re-tests and disputes as to test failures and re-tests under the provisions of OC5.5.5, OC5.5.6 and OC5.6; and
- (c) the provisions equivalent to OC5.5.5, OC5.5.6 and OC5.6 referred to in OC5.8.4(a) are effective to permit **The Company** to conduct itself and take decisions in such a manner in relation to test failures, re-tests and disputes as to test failures and re-tests in respect of **Embedded Medium Power Stations** not the subject of a **Bilateral Agreement**, **Embedded DC Converter Stations** not the subject of a **Bilateral Agreement** or **Embedded HVDC Equipment** not the subject of a **Bilateral Agreement** as it is able to conduct itself and take decisions in relation to test failures, re-tests and disputes as to test failures and re-tests under OC5.5.5, OC5.5.6 and OC5.6.

Extracts from Operating Code 9

To aid readability the order of some of OC9 sections has been changed. To help make comparisons with the existing Grid Code OC9 text, the relationship of these sections is as follows:

<u>Old Reference</u>	<u>Topic</u>	<u>New Reference</u>
OC9.4.7.12	Plan establishment (ie creation)	OC9.4.7.5
OC9.4.7.12.(b)(xii)	Plan testing	OC9.4.7.5.3
OC9.4.7.6	Plan provisions	OC9.4.7.6
-	DRZP operation	OC9.4.7.7
OC9.4.7.8	Expansion of power islands	OC9.4.7.8
OC9.4.7.7	Interconnexion of power islands	OC9.4.7.10
OC9.4.7.9	Return to normal	OC9.4.7.11
OC9.4.7.10	Conclusion of black start	OC9.4.7.12
OC9.4.7.11	Interconnectors	OC9.4.7.13

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OC9.1 INTRODUCTION

Operating Code No.9 ("OC9") covers the following: ~~processes and procedures by which The Company in coordination and liaison with Users, will restore the Total System or parts of the System following a Total Shutdown or Partial Shutdown.~~

OC9.1.1 ~~Black Starts~~ Approach to System Restoration

~~The implementation of recovery procedures following a Total Shutdown or Partial Shutdown.~~

Following a **Total Shutdown** or **Partial Shutdown**, there are two ways in which the **Total System** (or the disconnected part of the **System** in the case of a **Partial Shutdown**) can be re-established. These being a top-down approach using **Local Joint Restoration Plans** or a bottom-up approach using one or more **Distribution Restoration Zone Plans**.

In the case of a **Local Joint Restoration Plan**, **The Company** (or **Relevant Scottish Transmission Licensee** as applicable) will issue instructions to **Black Start Service Providers** who will then energise parts of the **Total System** to form a **Power Island**.

Where **Restoration Service Providers** have agreed to enter into a **Distribution Restoration Contract**, **The Company** (or **Relevant Scottish Transmission Licensee** as applicable) will issue instructions to the **Network Operator** who in turn will instruct an **Anchor Plant Owner** to energise a part of the **Network Operator's System** and subsequently for **Restoration Service Providers** **Plant and Apparatus** to be **Synchronised** to that part of the **Network Operator's System** to form a **Power Island**.

In practice in order to re-establish the **Total System** to normal operational conditions and restore supplies to **Users** in the shortest possible time and in the most reliable way, it is expected that **The Company** would initiate **Local Joint Restoration Plans** and **Distribution Restoration Zone Plans** in parallel.

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OC9.1.2 ~~Re-Synchronisation Of~~ Power Islands

The Following the establishment of **Power Islands** (either through the implementation of **Local Joint Restoration Plans or Distribution Restoration Zone Plans**) **The Company will then co-ordinate the Re-Synchronisation** of parts of the **Total System** which have become **Out of Synchronism** with each other irrespective of whether or not a **Total Shutdown** or **Partial Shutdown** has occurred.

OC9.1.3 **Joint System Incident Procedure**

~~The~~**A Joint System Incident procedure requires the** establishment of ~~a~~ communication ~~router~~~~routes~~ and arrangements between senior management representatives of **The Company** and **Users** involved in, or who may be involved in, an actual or potential serious or widespread disruption to the **Total System** or a part of the **Total System**, which requires, or may require, urgent managerial response, day or night, but which does not fall within the provisions of OC9.1.4.

OC9.1.4 It should be noted that under section 96 of the **Act**, the **Secretary of State** may give directions to **The Company** and/or any **Generator** and/or any **Supplier**, for the purpose of "mitigating the effects of any civil emergency which may occur" (ie. for the purposes of planning for a civil emergency); a civil emergency is defined in the **Act** as "any natural disaster or other emergency which, in the opinion of the **Secretary of State**, is or may be likely to disrupt electricity supplies". Under the Energy Act 1976, the **Secretary of State** has powers to make orders and give directions controlling the production, supply, acquisition or use of electricity, where an Order in Council under section 3 is in force declaring that there is an actual or imminent emergency affecting electricity supplies. In the event that any such directions are given, or orders made under the **Energy Act 1976**, the provisions of the **Grid Code** will be suspended in so far as they are inconsistent with them.

OC9.1.5 **The Company** shall procure that **Relevant Transmission Licensees** shall comply with OC9.4 and OC9.5 and any relevant **Local Joint Restoration Plan** or **OC9 De-Synchronised Island Procedure** where and to the extent that such matters apply to them.

OC9.2 **OBJECTIVE**

The overall objectives of **OC9** are:

OC9.2.1 To achieve, as far as possible, restoration of the **Total System** and associated **Demand** in the shortest possible time, taking into account **Power Station and Restoration Service Providers Plant and Apparatus** capabilities, including **Embedded Generating Units**, and **External Interconnections** and the operational constraints of the **Total System**.

OC9.2.2 To achieve the **Re-Synchronisation** of parts of the **Total System** which have become **Out of Synchronism** with each other.

OC9.2.3 To ensure that communication routes and arrangements are available to enable senior management representatives of **The Company** and **Users**, who are authorised to make binding decisions on behalf of **The Company** or the relevant **User**, as the case may be, to communicate with each other in the situation described in OC9.1.3.

OC9.2.4 To describe the role that in respect of **Transmission Systems**, **Relevant Transmission Licensees and Network Operators** may have in the restoration processes as detailed in the relevant **OC9 De-Synchronised Island Procedures** ~~and~~, **Local Joint Restoration Plans and Distribution Restoration Zone Plans**.

OC9.2.5 To identify and address as far as possible the events and processes necessary to enable the restoration of the **Total System**, after a **Total Shutdown** or **Partial Shutdown**. This is likely to require the following key processes to be implemented, typically, but not necessarily, in the order given below:

- (i) Selectively implement **Local Joint Restoration Plans** ~~through~~ **Network Operators**
- ~~(ii) Expand Power Islands to supply Power Stations~~**Embedded**
- ~~(ii) Selectively implement Distribution Restoration Zone Plans through Network Operators~~
- (iii) Expand and merge **Power Islands** leading to **Total System** energisation

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- (iv) Selectively reconnect **Demand**
- (v) Facilitate and co-ordinate returning the **Total System** back to normal operation
- (vi) Resumption of the **Balancing Mechanism** if suspended in accordance with the provisions of the **BSC**.

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OC9.3 SCOPE

OC9.3.1 **OC9** applies to **The Company** and to **Users**, which in **OC9** means:-

- (a) ~~(a)~~ **Generators**;
- (b) ~~(b)~~ **HVDC System Owners**;
- (c) **DC Converter Station owners**;
- (d) **Network Operators**; and
- (ee) **Non-Embedded Customers**; and
- (f) **Relevant Restoration Service Providers**.

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OC9.3.2 The procedure for the establishment of emergency support/contingency planning between **The Company** and **Externally Interconnected System Operators** is set out in the **Interconnection Agreement** with each **Externally Interconnected System Operator**.

OC9.3.3 In respect of **Transmission Systems**, OC9.4 and OC9.5 also apply to **Relevant Transmission Licensees**.

OC9.4 **BLACK START SYSTEM RESTORATION** Total Shutdown and Partial Shutdown

OC9.4.1 A "**Total Shutdown**" is the situation existing when all generation has ceased and there is no electricity supply from **External Interconnections**. Therefore, the **Total System** has shutdown with the result that it is not possible for the **Total System** to begin to function again without **The Company's** directions relating to a **Black Start**.

OC9.4.2 A "**Partial Shutdown**" is the same as a **Total Shutdown** except that all generation has ceased in a separate part of the **Total System** and there is no electricity supply from **External Interconnections** or other parts of the **Total System** to that part of the **Total System**. Therefore, that part of the **Total System** is shutdown with the result that it is not possible for that part of the **Total System** to begin to function again without **The Company's** directions relating to a **Black Start**.

OC9.4.3 During a **Total Shutdown** or **Partial Shutdown** and during the subsequent recovery, the **Licence Standards** may not apply and the **Total System** may be operated outside normal voltage and **Frequency** standards.

OC9.4.4 In a **Total Shutdown** and in a **Partial Shutdown** and during the subsequent recovery, it is likely to be necessary for **The Company** to issue **Emergency Instructions** in accordance with BC2.9.

OC9.4.5 Contribution to System Restoration
The Company will restore the System following a Total Shutdown or Partial Shutdown by issuing instructions to Black Start Service Providers through one or more Local Joint Restoration Plans as provided for in OC9.4.5.1 and by instructing Network Operators to activate one or more Distribution Restoration ZonesZone Plans as provided for in OC9.4.5.2

OC9.4.5.1 Local Joint Restoration

OC9.4.5.1.1 **Local Joint Restoration Plans** are dependent upon **Black Start Service Providers** who, are registered pursuant to the **Bilateral Agreement** as having the —ability to **Start-Up** from **Shutdown** and to energise a part of the **Total System**, or be **Synchronised** to the **System**, upon instruction from **The Company** —within two hours, without an external electrical power supply ("**Black Start Capability**").

OC9.4.5.1.2 For each **Black Start Station** and **Black Start HVDC System**, a **Local Joint Restoration Plan** will be produced jointly by **The Company**, the relevant **Black Start Service Provider** and **Network Operator** in accordance with the provisions of OC9.4.7.12OC9.4.7.5.1. The **Local Joint Restoration Plan** will detail the agreed method and procedure by which a **Genset** at a **Black Start Station** (possibly with other **Gensets** at that **Black Start Station**) and **Black Start HVDC Systems** will energise part of the **Total System** and meet complementary local **Demand** so as to form a **Power Island**.

OC9.4.5.1.3 In respect of **Scottish Transmission Systems**, a **Local Joint Restoration Plan** may cover more than one **Black Start Station** or **Black Start HVDC System** and may be produced with and include obligations on **Relevant Scottish Transmission Licensees**, **Generators** responsible for **Gensets** not at a **Black Start Station** and other **Users** including **HVDC System Owners** and **DC Converter Station Owners**.ability: The instruction to initiate a **Local Joint Restoration Plan** in Scotland will be the responsibility of the **Scottish Transmission Licensee** as provided for in STCP 06-1.

OC9.4.5.2 **Distribution Restoration Zones**

OC9.4.5.2.1 In a **Distribution Restoration Zone**, **Anchor Plant Owners** are required to have **Anchor Plant** with the capability to **Start-Up** from **Shutdown** and to energise a part of a **Network Operator's System**, upon instruction from ~~The~~**The Network Operator** within 8 hours, without an external electrical power supply. ("**Anchor Plant Capability**").

OC9.4.5.2.2 For each **Distribution Restoration Zone**, a **Distribution Restoration Zone Plan** will be produced jointly by the **Network Operator**, **The Company**, relevant **Transmission Licensee**, **Anchor Plant Owner** and **Restoration Service Providers** in accordance with the provisions of OC9.4.7.6.2. The **Distribution Restoration Zone Plan** will detail the agreed method and procedure by which an **Anchor Plant** will energise the **Distribution Restoration Zone**, ~~ie a part of the Network Operator's System~~, and meet complementary local **Demand** so as to form a **Power Island**.

OC9.4.5.2.3 In respect of **Scottish Transmission Systems**, **Scottish Transmission Licensees**, may instruct relevant **Network Operators** to activate one or more **Distribution Restoration ZonesZone Plans** as provided for in STCP 06-1. In this instance, the instruction to ~~initiate~~**activate** a **Distribution Restoration Zone Plan** to a **Scottish Network Operator** will be the responsibility of the **Scottish Transmission Licensee**.

OC9.4.6 **Situations requiring Black Start Situation**

In the event of a **Total Shutdown** or **Partial Shutdown**, **The Company** will, as soon as reasonably practical, inform **Users** (or, in the case of a **Partial Shutdown**, **Users** which in **The Company's** opinion need to be informed) and the **BSCCo** that a **Total Shutdown**, or, as the case may be, a **Partial Shutdown**, exists and that **The Company** intends to implement a **Black Start**. **The Company**— shall (as soon as is practicable) determine, in its reasonable opinion, the time and date with effect from which the **Total Shutdown** or **Partial Shutdown** commenced and notify the **BSCCo** of that time and date.

In the event of a **Total Shutdown** and following such notification, in accordance with the provisions of the **BSC**, the **BSCCo** will determine the **Settlement Period** with effect from which the **Balancing Mechanism** is suspended.

In the event of a **Partial Shutdown** and following such notification, the **Balancing Mechanism** will not be suspended until such time and date that the **Market Suspension Threshold** has been met, or deemed to have been met, in accordance with the provisions of the **BSC**. **The Company** shall carry out the monitoring activities required by paragraph G3.1 of the **BSC**.

Commented [MA(P67)]: No mention of transmission system, not even to specify how it will be separated from the distribution system – which will inevitably be required eg opening the SGT LV CBs

I can see that NGET (in E&R) is party to the DRZP **AJ** Response – I am not sure Transmission would be involved at this stage. If Transmission were involved it would be part of the DRZP so I am not sure we need to bring this point out specifically. – One for discussion.

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Following determination by **The Company** pursuant to its obligations under the **BSC** that the **Market Suspension Threshold** has been met, or deemed to have been met, **The Company** shall (as soon as practicable) inform the **BSCCo** of that time and date at which the **Market Suspension Threshold** was met, or deemed to have been met, and the **BSCCo** will determine the **Settlement Period** in accordance with the provisions of the **BSC** with effect from which the **Balancing Mechanism** will be suspended.

Should **The Company** determine that the **Total System** is capable of returning to normal operation without meeting the **Market Suspension Threshold**, **The Company** will follow the procedure given in OC9.4.7.11.

The **Black Start** will conclude with effect from the time and date determined in accordance with OC9.4.7.12.

In respect of **Scottish Transmission Systems**, in exceptional circumstances, as specified in the **Local Joint Restoration Plan**, **SPT** or **SHETL**, may invoke such **Local Joint Restoration Plan** for its own **Transmission System** and **Scottish Offshore Transmission Systems** connected to it and operate within its provisions. Under such circumstances a **Scottish Transmission Licensee** may also invoke/activate one or more **Distribution Restoration Zone Plans** in coordination with the relevant **Network Operators**.

OC9.4.7 Black Start

OC9.4.7.1 The procedure necessary for a recovery from a **Total Shutdown** or **Partial Shutdown** is known as a "**Black Start**". The procedure for a **Partial Shutdown** is the same as that for a **Total Shutdown** except that it applies only to a part of the **Total System**. It should be remembered that a **Partial Shutdown** may affect parts of the **Total System** which are not themselves shutdown.

OC9.4.7.2 The complexities and uncertainties of recovery from a **Total Shutdown** or **Partial Shutdown** require that **OC9** is sufficiently flexible in order to accommodate the full range of **User's Plant** and **Apparatus** and **Total System** characteristics and operational possibilities, and this precludes the setting out in the **Grid Code** itself of concise chronological sequences. The overall strategy will, in general, include the overlapping phases of establishment of **Genset(s)/Gensets** at an isolated **Power Station** or isolated **HVDC System** or isolated **DC Converter Station**, together with complementary local **Demand**, termed "**Power Islands**", step by step integration of these **Power Islands** into larger sub-systems which includes utilising the procedures in OC9.5 (**Re-Synchronisation of De-Synchronised Island**) and eventually re-establishment of the complete **Total System**.

The Company Instructions

OC9.4.7.3 The procedures for a **Black Start** will, therefore, be those specified by **The Company** at the time. These will normally recognise any applicable **Local Joint Restoration Plan** and/or **Distribution Restoration Zone Plan**. **Users** shall abide by **The Company's** instructions during a **Black Start** situation, even if these conflict with the general overall strategy outlined in OC9.4.7.2 or any applicable **Local Joint Restoration Plan**. The **Company's** instructions may (although this list should not be regarded as exhaustive) be to:-

(a) a **Black Start Station** or **Black Start HVDC System** relating to the commencement of supplying **Active Power**, to a **Network Operator** or **Non-Embedded Customer** relating to the restoration of **Demand**, and to a **Power Station** or **HVDC System** or **DC Converter Station** relating to preparation for commencement of supplying **Active Power** when an external power supply is made available to it, and in each case may include the requirement to undertake switching; and/or:-

(a)(b) a **Network Operator** to activate a **Distribution Restoration Zone Plan**.

In respect of **Scottish Transmission Systems SPT** and **SHETL** will act on **The Company's** behalf in accordance with its duties under the relevant **Local Joint Restoration Plan** or **Distribution Restoration Zone Plan**. **Scottish Users** shall abide by **SPT's** or **SHETL's** instructions given in accordance with the **Local Joint Restoration Plan** or **Distribution Restoration Zone Plan** during a **Black Start** situation.

OC9.4.7.4

- (a) **Black Start** following a **Total Shutdown** or where the **Balancing Mechanism** has been suspended following a **Partial Shutdown**

During a **Black Start** situation where the **Balancing Mechanism** has been suspended, all instructions to **Users** in England and Wales will be deemed to be **Emergency Instructions** under BC2.9.2.2 (iii). All such **Emergency Instructions** will recognise any differing **Black Start** operational capabilities (however termed) set out in the relevant **Ancillary Services Agreement** in preference to the declared operational capability as registered pursuant to **BC1** (or as amended from time to time in accordance with the **BC**). For the purposes of these instructions the **Black Start** will be an emergency circumstance under BC2.9.

In Scotland, **Gensets** or **HVDC Systems** or **DC Converter Station** that are not at **Black Start Stations** or **Black Start HVDC Systems**, but which are part of a **Local Joint Restoration Plan**, may be instructed in accordance with the provisions of that **Local Joint Restoration Plan**.

Instructions issued to **Network Operators** in England and Wales to activate a **Distribution Restoration Zone Plan** to energise a **Distribution Restoration Zone** will be issued by **The Company** to **Network Operators** as **Emergency Instructions**. **Network Operators** will then proceed in accordance with the provisions of the **Distribution Restoration Zone Plan**. Such instructions will (unless **The Company** specifies otherwise) be deemed to be **Emergency Instructions** under BC2.9.2.2 (iv). The **Network Operator** will be responsible for the operation of the **Distribution Restoration Zone** which will take into account the capabilities of **Anchor Plant**, relevant **Restoration Service Providers' Plant** and other **Plant** and **Apparatus** within the **Network Operator's System** including the **Distribution Restoration Zone Control System**. Such instructions would be pursuant to the terms of the **Distribution Restoration Zone Plan**.

In Scotland, **Scottish Transmission Licensees** will issue instructions (which unless specified otherwise, would be deemed to be **Emergency Instructions**) to relevant **Scottish Network Operators** to activate a **Distribution Restoration Zone Plan**.

- (b) **Black Start** following a **Partial Shutdown** where the **Balancing Mechanism** has not been suspended

During a **Black Start** situation where the **Balancing Mechanism** has not been suspended, instructions in relation to **Black Start Stations** and to **Network Operators**, **Black Start HVDC Systems** which are part of an invoked **Local Joint Restoration Plan** will (unless **The Company** specifies otherwise) be deemed to be **Emergency Instructions** under BC2.9.2.2 (iv) and will recognise any differing **Black Start** operational capabilities (however termed) set out in the relevant **Ancillary Services Agreement** in preference to the declared operational capability as registered pursuant to **BC1** (or as amended from time to time in accordance with the **BC**). For the purposes of these instructions the **Black Start** will be an emergency circumstance under BC2.9.

During a **Black Start** situation where the **Balancing Mechanism** has not been suspended, **The Company** may issue instructions to **Users** other than **Black Start Stations** and **Network Operators** which are part of an invoked **Local Joint Restoration Plan**. Such instructions would be **Emergency Instructions** pursuant to BC2.9.1.2(e)(i) subject to the requirements of BC2.9.2.2 being met.

In Scotland, **Gensets** and **HVDC Systems** or **DC Converter Station** that are not at **Black**

Start Stations or Black Start HVDC Systems, but which are part of an invoked **Local Joint Restoration Plan**, may be instructed in accordance with the provisions of that **Local Joint Restoration Plan**.

During **Black Start** where the **Balancing Mechanism** has not been suspended, **The Company** may issue instructions to **Network Operators** in England and Wales to activate a **Distribution Restoration Zone Plan** to energise one or more **Distribution Restoration Zones** in accordance with the provisions of the **Distribution Restoration Zone Plans**. Such instructions will (unless **The Company** specifies otherwise) be deemed to be **Emergency Instructions** under BC2.9.2.2 (iv). The **Network Operator** will be responsible for the operation of the **Distribution Restoration Zone** which will take into account the capabilities of **Anchor Plant**, relevant **Restoration Service Providers' Plant** and other **Plant** and **Apparatus** within the **Network Operator's System** including the **Distribution Restoration Zone Control System**. Such instructions would be pursuant to the terms of the **Distribution Restoration Zone Plan**.

In Scotland, **Relevant Transmission Licensee's** may issue instructions (which unless specified otherwise, would be deemed to be **Emergency Instructions**) to **Scottish Network Operators**, to activate on one or more **Distribution Restoration Zone Plans**.

(c) Requirements to inform **The Company** where a **Genset, HVDC System or DC Converter** cannot operate within its safe operating limits during the **Demand** restoration process

If during the **Demand** restoration process, any **Genset or HVDC System or DC Converter Station** cannot, because of the **Demand** being experienced, keep within its safe operating parameters, the **Black Start Service Provider** shall, unless a **Local Joint Restoration Plan** is in operation, inform **The Company**. **The Company** will, where possible, either instruct **Demand** to be altered or will re-configure the **National Electricity Transmission System** or will instruct a **User** to re-configure its **System** in order to alleviate the problem being experienced by the **Genset or HVDC System or DC Converter Station**. If a **Local Joint Restoration Plan** is in operation, then the arrangements set out therein shall apply. However, **The Company** accepts that any decision to keep a **Genset or HVDC System or DC Converter Station** operating, if outside its safe operating parameters, is one for the **Black Start Service Providers** concerned alone and accepts that the **Black Start Service Provider** may change output on that **Genset or HVDC System or DC Converter Station** if it believes it is necessary for safety reasons (whether relating to personnel or **Plant** and/or **Apparatus**). If such a change is made without prior notice, then the **Black Start Service Provider** shall inform **The Company** as soon as reasonably practical (unless a **Local Joint Restoration Plan** is in operation in which case the arrangements set out therein shall apply).

Embedded Power Stations

OC9.4.7.5 Without prejudice to the provisions of OC9.4.7.8, **Network Operators with Embedded Power Stations or Embedded HVDC Systems or Embedded DC Converter Stations** will comply with any directions of **The Company** to restore **Demand** to be met by the **Embedded Power Stations, Embedded HVDC Systems or Embedded DC Converter Stations**.

OC9.4.7.6 **Local Joint Restoration Plan and Distribution Restoration Zone Plan Establishment**

OC9.4.7.5.1 **Local Joint Restoration Plan Establishment**

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- (a) In England and Wales, in relation to each **Black Start Station** and each **Black Start HVDC System**, **The Company**, **NGET**, ~~the~~ **Network Operator** and the relevant **Black Start Service Provider** will discuss and agree a **Local Joint Restoration Plan**. Where at the date of the first inclusion of this ~~OC9.4.7.12~~**OC9.4.7.115.1** into the Grid Code a local plan covering the procedures to be covered in a **Local Joint Restoration Plan** is in existence and agreed, **The Company** will discuss this with **NGET**, ~~the~~ **Network Operator** and the relevant **Generator** or **HVDC System Owner** or **DC Converter Station Owner** to agree whether it is consistent with the principles set out in this OC9.4. If it is agreed to be so consistent, then it shall become a **Local Joint Restoration Plan** under this **OC9** and the relevant provisions of ~~OC9.4.7.12~~**OC9.4.7.115.1** shall apply. If it is not agreed to be so consistent, then the provisions of ~~OC9.4.7.12~~**OC9.4.7.115.1**(b) shall apply as if there is no **Local Joint Restoration Plan** in place. ~~For the avoidance of doubt, a Local Joint Restoration Plan would not cover the situation where a Distribution Restoration Zone has been established. The requirements associated with Distribution Restoration Zones which are pursuant to a Distribution Restoration Zone Plan are covered under OC9.4.7.5.2.~~

In respect of **Scottish Transmission Systems** where a requirement for a **Local Joint Restoration Plan** is identified, **The Company**, the **Relevant Scottish Transmission Licensee(s)**, the **Network Operator** and **Black Start Service** ~~Provider's~~**Providers** will discuss and agree a **Local Joint Restoration Plan**. In addition, other **Users**, including other **Generators** or **HVDC System Owners** or **DC Converter Station Owners**, may be reasonably required by **The Company** to discuss and agree a **Local Joint Restoration Plan**. ~~For the avoidance of doubt, a Local Joint Restoration Plan would not cover the situation where a Distribution Restoration Zone has been established. The requirements associated with Distribution Restoration Zones in Scotland which are pursuant to a Scottish Distribution Restoration Zone Plan are covered under OC9.4.7.5.2(b).~~

- (b) In England and Wales, where the need for a **Local Joint Restoration Plan** arises when there is none in place, the following provisions shall apply:
- (i) **The Company**, **NGET**, ~~the~~ **Network Operator** and the relevant **Black Start Service Provider** will discuss and agree the detail of the **Local Joint Restoration Plan** as soon as the requirement for a **Local Joint Restoration Plan** is identified by **The Company**. **The Company** will notify all affected **Users**, and will initiate these discussions.
 - (ii) Each **Local Joint Restoration Plan** will be in relation to a specific **Black Start Station** or **Black Start HVDC System**.
 - (iii) The **Local Joint Restoration Plan** will record which **Users** and which **User Sites** are covered by the **Local Joint Restoration Plan** and set out what is required from **The Company**, **NGET** and each **User** should a **Black Start** situation arise.
 - (iv) Each **Local Joint Restoration Plan** shall be prepared by **The Company** to reflect the above discussions and agreement.
 - (v) Each page of the **Local Joint Restoration Plan** shall bear a date of issue and the issue number.
 - (vi) When a **Local Joint Restoration Plan** has been prepared, it shall be sent by **The Company** to **NGET** and the **Users** involved for confirmation of its accuracy.
 - (vii) The **Local Joint Restoration Plan** shall then (if its accuracy has been confirmed) be signed on behalf of **The Company** and on behalf of **NGET** and each relevant **User** by way of written confirmation of its accuracy.
 - (viii) Once agreed under this ~~OC9.4.7.12~~**OC9.4.7.115.1(b)**, the procedure will become a **Local Joint Restoration Plan** under the Grid Code and (subject to any change pursuant to this OC9) will apply between **The Company** and **NGET** and the relevant **Users** as if it were part of the Grid Code.

- (ix) Once signed, a copy of the **Local Joint Restoration Plan** will be distributed by **The Company** to **NGET** and each **User** which is a party to it accompanied by a note indicating the date of implementation.
- (x) **The Company**, **NGET** and **Users** must make the **Local Joint Restoration Plan** readily available to the relevant operational staff.
- (xi) If **The Company**, or **NGET** or any **User** which is a party to a **Local Joint Restoration Plan**, becomes aware that a change is needed to that **Local Joint Restoration Plan**, it shall (in the case of **The Company**) initiate a discussion between **The Company** and the relevant **Users** to seek to agree the relevant change. If **NGET** or a **User** becomes so aware, it shall contact **The Company** who will then initiate such discussions. The principles applying to establishing a new **Local Joint Restoration Plan** under this ~~OC9.4.7.12~~**OC9.4.7.115.1(b)** shall apply to such discussions and to any consequent changes.

~~(xii) **The Company**, **NGET**, the **Network Operator** and the relevant **Generator** or **HVDC System Owner** or **DC Converter Station Owner** will conduct regular joint exercises of the **Local Joint Restoration Plan** to which they are parties. The objectives of such exercises include:~~

- ~~• To test the effectiveness of the **Local Joint Restoration Plan**;~~
- ~~• To provide for joint training of the parties in respect of the **Local Joint Restoration Plan**;~~
- ~~• To maintain the parties' awareness and familiarity of the **Local Joint Restoration Plan**;~~
- ~~• To promote understanding of each parties' roles under a **Local Joint Restoration Plan**;~~
 - ~~• To identify any improvement areas which should be incorporated in to the **Local Joint Restoration Plan**;~~
 - ~~• The principles applying to the establishment of a new **Local Joint Restoration Plan** under this ~~OC9.4.7.12~~**OC9.4.7.11** shall apply to any changes to the **Local Joint Restoration Plan**;~~

~~**The Company** will propose to the parties of a **Local Joint Restoration Plan** a date for the exercise to take place, to be agreed with the other parties. All the **Local Joint Restoration Plan** parties will jointly share the task of planning, preparing, participating in and facilitating the exercises, which will normally be in desktop format or as otherwise agreed. The precise timing of the exercise for each **Local Joint Restoration Plan** will be agreed by all parties, but will not be less than ~~one every 3~~ **years**.~~

- (c) In respect of **Scottish Transmission Systems**, where the need for a **Local Joint Restoration Plan** arises, the following provisions shall apply:
- (i) **The Company**, the **Relevant Scottish Transmission Licensee(s)**, the **Network Operator** and the relevant **Black Start Service Provider** will discuss and agree the detail of the **Local Joint Restoration Plan** as soon as the requirement for a **Local Joint Restoration Plan** is identified by **The Company**. In addition, other **Scottish Users**, including other **Generators**, **HVDC System Owners** and **DC Converter Station Owners**, may be reasonably required by **The Company** to discuss and agree details of the **Local Joint Restoration Plan** as soon as the requirement for a **Local Joint Restoration Plan** is identified by **The Company**. **The Company** will notify the **Relevant Scottish Transmission Licensee(s)** and all affected **Scottish Users**, and will initiate these discussions.

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- (ii) Each **Local Joint Restoration Plan** may be in relation to either a specific **Black Start Station** or a number of **Black Start Stations**, and may include **Gensets** at **Power Stations** other than a **Black Start Station**. Each **Local Joint Restoration Plan** could equally apply to a specific **Black Start HVDC System** or a number of **Black Start HVDC Systems** and may include **HVDC Systems** or **DC Converter Stations** other than a **Black Start HVDC System**. For the avoidance of doubt, this would not preclude a **Local Joint Restoration Plan** from comprising a combination of **Power Stations**, **HVDC Systems** or **DC Converter Stations** irrespective of whether they have a **Black Start Capability**.
- (iii) The **Local Joint Restoration Plan** will record which **Scottish Users** and which **Scottish User Sites** are covered by the **Local Joint Restoration Plan** and set out what is required from **The Company**, the **Relevant Scottish Transmission Licensee(s)** and each **Scottish User** should a **Black Start** situation arise.
- (iv) Each **Local Joint Restoration Plan** shall be prepared by **The Company** to reflect the above discussions and agreement.
- (v) Each page of the **Local Joint Restoration Plan** shall bear a date of issue and the issue number.
- (vi) When a **Local Joint Restoration Plan** has been prepared, it shall be sent by **The Company** to the **Relevant Scottish Transmission Licensee(s)** and **Scottish Users** involved for confirmation of its accuracy.
- (vii) The **Local Joint Restoration Plan** shall then (if its accuracy has been confirmed) be signed on behalf of **The Company** and on behalf of each relevant **Scottish User** and **Relevant Scottish Transmission Licensee(s)** by way of written confirmation of its accuracy.
- (viii) Once agreed under this ~~OC9.4.7.12~~OC9.4.7.11-5.1(c), the procedure will become a **Local Joint Restoration Plan** under the Grid Code and (subject to any change pursuant to this **OC9**) will apply between **The Company**, **Relevant Scottish Transmission Licensee(s)** and the relevant **Scottish Users** as if it were part of the Grid Code.
- (ix) Once signed, a copy of the **Local Joint Restoration Plan** will be distributed by **The Company** to the **Relevant Scottish Transmission Licensee(s)** and each **Scottish User** which is a party to it accompanied by a note indicating the date of implementation.
- (x) **The Company**, the **Relevant Scottish Transmission Licensee(s)** and **Scottish Users** must make the **Local Joint Restoration Plan** readily available to the relevant operational staff.
- (xi) If **The Company**, the **Relevant Scottish Transmission Licensee(s)** or any **Scottish User** which is a party to a **Local Joint Restoration Plan**, becomes aware that a change is needed to that **Local Joint Restoration Plan**, it shall (in the case of **The Company**) initiate a discussion between **The Company**, the **Relevant Scottish Transmission Licensee(s)** and the relevant **Scottish Users** to seek to agree the relevant change. If a **Scottish User** or a **Relevant Scottish Transmission Licensee** becomes so aware, it shall contact **The Company** who will then initiate such discussions. The principles applying to establishing a new **Local Joint Restoration Plan** under this ~~OC9.4.7.12~~OC9.4.7.11-5.1(c) shall apply to such discussions and to any consequent changes.

~~(xii) The Company, the Relevant Scottish Transmission Licensee(s), the Network Operator and the relevant Black Start Service Provider will~~

OC9.4.7.5.2 Distribution Restoration Zone Plan Establishment

(a) In England and Wales, where **The Company** believe that a **Distribution Restoration Zone** would be beneficial, **The Company, NGET and Network Operator** shall have agreed to explore the possibility of establishing a **Distribution Restoration Zone Plan**, the following provisions shall apply:

(i) **The Company, NGET and the Network Operator** will discuss and agree the detail of a **Distribution Restoration Zone Plan** as soon as reasonably practicable after the potential requirement for a **Distribution Restoration Zone Plan** is identified by **The Company**. ~~this may~~ This may involve discussions between relevant potential **Restoration Service Providers**. ~~The Company in conjunction with and the Network Operator and will initiate these discussions.~~ An initial feasibility assessment carried out jointly by **The Company** and the **Network Operators** may result in **The Company** running a procurement /tender process, where they have been successful in a procurement/tender process run by **The Company**. **The Company** will notify all affected **Network Operators** and will initiate these discussions. If after discussions or analysis, **The Company, NGET and Network Operator** agree a **Distribution Restoration Zone Plan** is not viable, then no further work to develop the **Distribution Restoration Zone Plan** needs to be carried out.

(ii) Each **Distribution Restoration Zone Plan** will be in relation to a specific part of the **Network Operator's System** and may include parts of the **Transmission System** and in each case each **Distribution Restoration Zone Plan** will be specific to a single **Anchor Plant**.

(iii) The **Distribution Restoration Zone Plan** will record which the relevant **Restoration Service Providers** and which the relevant **Restoration Service Providers' Plant and Apparatus** are included in the **Distribution Restoration Zone Plan** and set out what is required from **The Company, NGET, Network Operator**, each relevant **Restoration Service Provider** and each relevant **Transmission Licensee**. It shall include the detailed requirements for the routine testing of **any Restoration Service Provider's Plant and Apparatus** for the contracted services provided, in accordance with the procedures in OC.5.7.4.

(iv) Each **Distribution Restoration Zone Plan** shall be prepared by the relevant **Network Operator** and agreed with **The Company, NGET** and relevant **Restoration Service Providers** to reflect the above discussions and agreement.

(v) Each **Distribution Restoration Zone Plan** will include the test criteria to be satisfied by each **Restoration Service Provider's Plant and Apparatus** when subject to the testing requirements of OC5.7.4.

(vi) Each page of the **Distribution Restoration Zone Plan** shall bear a date of issue and the issue number.

(vii) When a **Distribution Restoration Zone Plan** has been prepared, it shall be sent by the relevant **Network Operator to The Company, NGET** and the relevant **Restoration Service Providers** involved for confirmation of its accuracy.

(viii) The **Distribution Restoration Zone Plan** shall then (pending its accuracy being confirmed) be signed on behalf of the **Network Operator, The Company, NGET** and each relevant **Restoration Service Provider** as a written confirmation of its accuracy.

(ix) Once agreed under this OC9.4.7.5.2(a), the procedure shall become a **Distribution Restoration Zone Plan** under the Grid Code and **Distribution Code** (subject to any change pursuant to this OC9 and DOC9 of the **Distribution Code**) and will apply between **The Company, NGET, Network Operator** and the relevant **Restoration Service Provider(s)** as if it were part of the Grid Code.

(x) Once signed, a copy of the **Distribution Restoration Zone Plan** shall be distributed by the **Network Operator to The Company, NGET** and each relevant **Restoration Service Provider** which is a party to it, indicating the date of implementation.

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Suggested tweaks to the process AJ Response – This needs a complete re-write The tender process should already have taken place and fall outside the Grid Code – One for discussion.

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(xi) The Network Operator, The Company, NGET and relevant Restoration Service Providers must make the Distribution Restoration Zone Plan readily available to the relevant operational staff.

(xii) If the Network Operator, The Company, NGET or any other relevant Restoration Service Provider which is a party to a Distribution Restoration Zone Plan, becomes aware that a change is needed to that Distribution Restoration Zone Plan, it shall initiate a discussion between the Network Operator, The Company, NGET, and the relevant Restoration Service Provider(s) to seek to agree the relevant change. If a Network Operator, or relevant Restoration Service Provider becomes so aware, it shall contact The Company in coordination with the Network Operator who will then initiate such discussions. The principles applying to establishing a new Distribution Restoration Zone Plan under this OC9.4.7.5.2(a) shall apply to such discussions and to any consequent changes.

(b) In respect of Scottish Transmission Systems, where the need for a Distribution Restoration Zone Plan arises, the following provisions shall apply:

(i) The Company, the Relevant Scottish Transmission Licensee(s), the Network Operator and the relevant Restoration Service Providers (including Anchor Plant Owners) will discuss and agree the detail of the Distribution Restoration Zone Plan as soon as the requirement for a Distribution Restoration Zone Plan is identified by The Company. In addition, other potential Restoration Service Providers located within a Scottish Distribution Restoration Zone including other Generators, HVDC System Owners and DC Converter Owners, may be reasonably required by The Company and Network Operator to discuss and agree details of the Distribution Restoration Zone Plan as soon as reasonably practicable after the requirement for a Distribution Restoration Zone Plan is identified by The Company. The Company will notify the Relevant Scottish Transmission Licensee(s) and Network Operator of the initiation of the Distribution Restoration Zone Plan development. The Network Operator will be responsible for notifying all affected Scottish Restoration Service Providers party to one or more Distribution Restoration Zones.

(ii) Each Distribution Restoration Zone Plan will be in relation to a specific Network Operator's System and will include The Company, the Relevant Scottish Transmission Licensee, relevant Network Operator and relevant Restoration Service Providers.

(iii) The Distribution Restoration Zone Plan will record which Restoration Service Providers –and which of their sites are within the scope of the Distribution Restoration Zone Plan and set out what is required from the relevant Network Operator, The Company, the Relevant Scottish Transmission Licensee(s) and each relevant Restoration Service Provider should a Black Start situation arise. It shall include the detailed requirements for the routine testing of any Restoration Services Provider's Plant and Apparatus for the contracted services provided, in accordance with the procedures in OC.5.7.4.

(iv) Each Distribution Restoration Zone Plan shall be prepared by the relevant Scottish Network Operator in coordination with The Company to reflect the above discussions and agreement.

(v) Each Distribution Restoration Zone Plan will include the test criteria to be satisfied by each Restoration Service Provider's Plant and Apparatus when subject to the testing requirements of OC5.7.4.

(vi) Each page of the Distribution Restoration Zone Plan shall bear a date of issue and the issue number.

Commented [AMC73]: This should be updated to match the E&W procedure above AJ Response – Comment noted – in view that OC9 will need to be rewritten for Distributed Re-Start then we will pick this up when OC9 is rewritten.

Commented [AMC74]: This should be updated to match the E&W procedure above AJ Response – As above.

Commented [VG75]: Why is this different from the E+W situation described in a(i) above? Should this not have similar wording as it gives rise to the possibility that a DZRP may not be viable in E+W but there isn't a similar possibility of this arising in Scotland? Suggest that this section (b) is reviewed and aligned with the words used for the E+W as appropriate. AJ Response – Agree as above.

- (vii) When a **Distribution Restoration Zone Plan** has been prepared, it shall be sent by the relevant **Network Operator** to **The Company**, the **Relevant Scottish Transmission Licensee(s)** and the relevant **Restoration Service Providers** involved for confirmation of its accuracy.
- (viii) The **Distribution Restoration Zone Plan** shall then (if its accuracy has been confirmed) be signed by the relevant **Network Operator**, **The Company**, the **Relevant Scottish Transmission Licensee(s)** and **Relevant Restoration Service Providers** to confirm accuracy.
- (ix) Once agreed under this OC9.4.7.5.2(b), the procedure will become a **Distribution Restoration Zone Plan** under the Grid Code and **Distribution Code** (subject to any change pursuant to this OC9 and DOC9 of the **Distribution Code**) and will apply between **The Company**, **Scottish Transmission Licensee**, the **Network Operator** and the relevant **Restoration Service Providers** as if it were part of the Grid Code.
- (x) Once signed, a copy of the **Distribution Restoration Zone Plan** shall be distributed by the relevant **Network Operator** to **The Company**, the **Relevant Scottish Transmission Licensee(s)** and each relevant **Restoration Service Provider** which is a party to it accompanied by a note indicating the date of implementation.
- (xi) The **Network Operator**, **The Company**, the **Relevant Scottish Transmission Licensee(s)** and each relevant **Restoration Service Provider** must make the **Distribution Restoration Zone Plan** readily available to the relevant operational staff.
- (xii) If the relevant **Network Operator**, **The Company**, the **Relevant Scottish Transmission Licensee(s)** or any relevant **Restoration Service Provider** which is a party to a **Distribution Restoration Zone Plan**, becomes aware that a change is needed to that **Distribution Restoration Zone Plan**, it shall initiate a discussion between the relevant **Network Operator**, **The Company**, the **Relevant Scottish Transmission Licensee(s)** and the relevant **Restoration Service Provider(s)** to seek to agree the relevant change. If a **Network Operator**, a **Relevant Scottish Transmission Licensee** or relevant **Restoration Service Provider** becomes so aware, it shall contact **The Company** in coordination with the **Network Operator** who will then initiate such discussions. The principles applying to establishing a new **Distribution Restoration Zone Plan** under this OC9.4.7.5.2(b) shall apply to such discussions and to any consequent changes.

OC9.4.7.5.3 Local Joint Restoration Plan and Distributed Restoration Plan Testing

(a) Local Joint Restoration Plan testing in England and Wales

The Company, **NGET**, the **Network Operator** and the relevant **Generator** or **HVDC System Owner** or **DC Converter Station Owner** shall conduct regular joint exercises of the **Local Joint Restoration Plan** to which they are parties. The objectives of such exercises include:

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

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- The principles applying to the establishment of a new **Local Joint Restoration Plan** under this OC9.4.7.5.1(b) shall apply to any changes to the **Local Joint Restoration Plan**.

The Company will propose to the parties of a **Local Joint Restoration Plan** a date for the exercise to take place, to be agreed with the other parties. All the **Local Joint Restoration Plan** parties will jointly share the task of planning, preparing, participating in and facilitating the exercises, which will normally be in desktop format or as otherwise agreed. The precise timing of the exercise for each **Local Joint Restoration Plan** will be agreed by all parties, but will not be less than once every 5 years.

(b) Local Joint Restoration Plan testing in Scotland

The Company, the Relevant Scottish Transmission Licensee(s), the Network Operator and the relevant Black Start Service Provider will conduct regular joint exercises of the **Local Joint Restoration Plan** to which they are parties. The objectives of such exercises include:

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

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The principles applying to the establishment of a new **Local Joint Restoration Plan** under this ~~OC9.4.7.12~~OC9.4.7.115.1(c) shall apply to any changes to the **Local Joint Restoration Plan**.

—The Company will propose to the parties of a **Local Joint Restoration Plan** a date for the exercise to take place, to be agreed with the other parties. All the **Local Joint Restoration Plan** parties will jointly share the task of planning, preparing, participating in and facilitating the exercises, which will normally be in desktop format or as otherwise agreed. The precise timing of the exercise for each **Local Joint Restoration Plan** will be agreed by all parties, but will not be less than ~~one~~once every ~~85~~energise years.

Commented [AMC76]: Not sure this should be a bullet AJ Response – It is existing text but happy to change.

Commented [AMC77]: is this a conscious changes to reflect E&R? AJ Response Yes – See E&R Art 51(3)

(c) Distribution Restoration Zone Plan testing in England and Wales

The Company, NGET, the Network Operator and the relevant Restoration Service Provider(s) will conduct regular joint exercises of the **Distribution Restoration Zone Plan** to which they are parties. The objectives of such exercises include:

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

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The principles applying to the establishment of a new **Distribution Restoration Zone Plan** under this OC9.4.7.5.2(a) shall apply to any changes to the **Distribution Restoration Zone Plan**.

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Commented [AMC78]: Not sure this should be a bullet – AJ Response – Text updated.

The **Company** in coordination with the **Network Operator** will propose to the other parties of a **Distribution Restoration Zone Plan** a date for the exercise to take place to be agreed with the other parties. All the **Distribution Restoration Zone** parties will jointly share the task of planning, preparing, participating in and facilitating the exercises, which will normally be in desktop format or as otherwise agreed. The precise timing of the exercise for each **Distribution Restoration Zone Plan** will be agreed by all parties, but will not be less than once every 5 years.

(d) **Distribution Restoration Zone Plan testing in Scotland**

The **Company**, the **Relevant Scottish Transmission Licensee(s)**, the **Network Operator** and the **Relevant Restoration Service Providers** will conduct regular joint exercises of the **Distribution Restoration Zone Plan** to which they are parties. The objectives of such exercises include:

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

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The principles applying to the establishment of a new **Distribution Restoration Zone Plan** under this OC9.4.9 shall apply to any changes to the **Distribution Restoration Zone Plan**.

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Commented [AMC79]: Ditto AJ response - corrected

The **Company** in coordination with the **Relevant Network Operator** and **Relevant Scottish Transmission Licensee** will propose to the parties of a **Distribution Restoration Zone Plan** a date for the exercise to take place, to be agreed with the other parties. All the **Distribution Restoration Zone Plan** parties will jointly share the task of planning, preparing, participating in and facilitating the exercises, which will normally be in desktop format or as otherwise agreed. The precise timing of the exercise for each **Distribution Restoration Zone Plan** will be agreed by all parties but will not be less than one every 5 years.

OC9.4.7.6 Local Joint Restoration Plan operation and Distribution Restoration Zone Plan provisions.

OC9.4.7.6.1. Local Joint Restoration Plan

- (a) The following provisions apply in relation to a **Local Joint Restoration Plan**. ~~A Distribution Restoration Zone shall not form part of a Local Joint Restoration Plan but instead would be treated separately under a Distribution Restoration Zone Plan as detailed in OC9.4.7.5.2.~~ As set out in OC9.4.7.3, ~~The Company~~ may issue instructions which conflict with a **Local Joint Restoration Plan**. In such cases, these instructions will take precedence over the requirements of the **Local Joint Restoration Plan**. When issuing such instructions, **The Company** shall state whether or not it wishes the remainder of the **Local Joint Restoration Plan** to apply. If, ~~notwithstanding that notwithstanding the conflict,~~ **The Company** has stated that it wishes the remainder of the **Local Joint Restoration Plan** to apply, the **Black Start Service Provider** or the relevant **Network Operator** consider that **The Company's** instructions mean that it is not possible to operate the **Local Joint Restoration Plan** as modified by those instructions, any of them may give notice to **The Company** and the other parties to the **Local Joint Restoration Plan** to this effect and **The Company** shall immediately consult with all parties to the **Local Joint Restoration Plan**. Unless all parties to the **Local Joint Restoration Plan** reach an agreement forthwith as to how the **Local Joint Restoration Plan** shall operate in those circumstances, operation in accordance with the **Local Joint Restoration Plan** will terminate.
- (b) Where **The Company**, as part of a **Black Start**, has given an instruction to a **Black Start Service Provider** to initiate **Start-Up**, the relevant **Genset(s)** at the **Black Start Station** or **Black Start HVDC System** will **Start-Up** in accordance with the **Local Joint Restoration Plan**.
- (c) **The Company** will advise the relevant **Network Operator** of the requirement to switch its **User System** ~~so as to~~ segregate its **Demand** and to carry out such other actions as set out in the **Local Joint Restoration Plan**. The relevant **Network Operator** will then operate in accordance with the provisions of the **Local Joint Restoration Plan**.
- (d) **The Company** will ensure that switching carried out on the **National Electricity Transmission System** and other actions are as set out in the **Local Joint Restoration Plan**.
- (e) Following notification from the **Black Start Service Provider** ~~that the Black Start Station or Black Start HVDC System is ready to accept load,~~ **The Company** will instruct the **Black Start Service Provider** ~~to energise part of the Total System.~~ The **Black Start Service Provider** ~~and the relevant Network Operator~~ will then, in accordance with the requirements of the **Local Joint Restoration Plan**, establish communication and agree the output of the relevant **Genset(s)** and/or **HVDC System** and/or **DC Converter Station** and the connection of **Demand** so as to establish a **Power Island**. During this period, the **Black Start Service Provider** will be required to regulate the output of the relevant **Black Start Station** or **Black Start HVDC System** to the **Demand** prevailing in the **Power Island** in which it is situated, on the basis that it will (where practicable) seek to maintain the **Target Frequency**. The **Genset(s)** at the **Black Start Station** or **Black Start HVDC System** will (where practical) also seek to follow the requirements relating to **Reactive Power** (which may include the requirement to maintain a target voltage) set out in the **Local Joint Restoration Plan**.
- (f) Operation in accordance with the **Local Joint Restoration Plan** will be terminated by **The Company** (by notifying the relevant **Users**) prior to connecting the **Power Island** to other **Power Islands** (other than, in Scotland, as allowed for in the **Local Joint Restoration Plan**), or to the **User System** of another **Network Operator**, or to the synchronising of **Gensets** at other **Power Stations** or **HVDC Systems** or **DC Converter Station** (other than, in Scotland, those forming part of the **Local Joint Restoration Plan**). Operation in accordance with the **Local Joint Restoration Plan** will also terminate in the circumstances provided for in OC9.4.7.6(a)5.1 if an agreement is not reached or if **The Company** states that it does not wish the remainder of the **Local Joint Restoration Plan** to apply. **Users** will then comply with the **Bid-Offer Acceptances** or **Emergency Instructions of The Company**.

Commented [MA(P80)]: As drafted an LJRP should be independent of a DRZP. We agree that only one plan could be activated at any one time, however it is not clear why a DRZP and a LJRP couldn't be in place for the same part of the network. Our existing LJRP's include a significant number of GSPs, so requiring independence between a LJRP and DRZP would restrict the number of potential DRZP. In a black start scenario having a wider range of options that can be implemented is probably beneficial. **AJ Response –** This picks up on the point raised at the top of the document and requires some discussion.

- (g) In Scotland, **Gensets** or **HVDC Systems** or **DC Converter ~~Station~~Stations** included in a **Local Joint Restoration Plan**, but not at a **Black Start Station** or **Black Start HVDC System**, will operate in accordance with the requirements of the **Local Joint Restoration Plan**.

Interconnection of Power Islands

OC9.4.7.8 ~~The Company~~ will instruct the relevant ~~Users~~ so as to interconnect ~~Power Islands~~ to achieve larger sub-systems, and subsequently the interconnection of these sub-systems to form an integrated system. This should eventually achieve the re-establishment of the ~~Total System~~ or that part of the ~~Total System~~ subject to the ~~Partial Shutdown~~, as the case may be. The interconnection of ~~Power Islands~~ and sub-systems will utilise the provisions of all or part of OC9.5 (~~Re-Synchronisation of De-synchronised Islands~~) and in such a situation such provisions will be part of the ~~Black Start~~.

OC9.4.7.8 As part of the ~~Black Start~~ strategy each ~~Network Operator~~ with either OC9.4.7.6.2 Distribution Restoration Zone Plan

(a) The following provisions apply in relation to a Distribution Restoration Zone Plan. For the avoidance of doubt, a Local Joint Restoration Plan would not be considered to ~~form part of~~ incorporate a Distribution Restoration Zone Plan but instead would be treated under a Local Joint Restoration Plan as detailed in OC9.4.7.5.1. As set out in OC9.4.7.3, ~~The Company~~ may issue instructions which conflict with a Distribution Restoration Zone Plan. In such cases, these instructions will take precedence over the requirements of the Distribution Restoration Zone Plan. When issuing such instructions, ~~The Company~~ shall state whether or not it wishes the remainder of the Distribution Restoration Zone Plan to apply. If, notwithstanding the conflict, ~~The Company~~ has stated that it wishes the remainder of the Distribution Restoration Zone Plan to apply, the Network Operator Relevant Restoration Service Provider(s) or the relevant Network Operator Restoration Service Provider(s) consider that ~~The Company's~~ instructions mean that it is not possible to operate the Distribution Restoration Zone Plan as modified by those instructions, any of them may give notice to ~~The Company~~ and the other parties to the Distribution Restoration Zone Plan to this effect and ~~The Company~~ shall immediately consult with all parties to the Distribution Restoration Zone Plan. Unless all parties to the Distribution Restoration Zone Plan reach an agreement forthwith as to how the Distribution Restoration Zone Plan shall operate in those circumstances, operation in accordance with the Distribution Restoration Zone Plan will terminate.

(b) Where ~~The Company~~, as part of a Black Start condition, has given an instruction to a Network Operator to energise/activate a Distribution Restoration Zone Plan, the relevant Restoration Service Provider(s) will Start-Up their Plant upon instruction from the relevant Network Operator in accordance with the Distribution Restoration Zone Plan.

(c) ~~The Company~~ will ensure that switching is carried out on the National Electricity Transmission System and other actions are as set out in the Distribution Restoration Zone Plan.

Commented [AMC81]: consistency with LJRP text AJ Response – OC9 will require a complete rewrite for ESRS so we will pick this up when we redraft OC9.

Commented [MA(P82): energising the DRZ is what the AP does on instruction from the DNO AJ Response – Agree – Text updated.

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Commented [MA(P83): Need to check if this process aligns with the BAU process where NGET switching is required before DNO activities – is does NGET confirm that switching has been carried out directly with the DNO – or via NGESO.

Consistency with BAU processes would be good. AJ Response – It would be between the ESO and NGET and the ESO then liaise with the DNO which I think is the usual BAU process under OC7. To be discussed.

(d) Following confirmation from the **Network Operator** and **Relevant Transmission Licensee** that their **Systems** have been configured to form a **Distribution Restoration Zone**, the necessary protection, control and any automatic facilities (including the use of a **Distribution Restoration Zone Control System** if applicable) are ready and relevant **Restoration Service Providers** are ready, **The Company** will instruct the **Network Operator** to instruct the **Anchor Plant Owner** to energise the appropriate part of the **Network Operator's System**. The **Network Operator** will then, in accordance with the requirements of the **Distribution Restoration Zone Plan**, establish communication and agree the output of the relevant **Anchor Plant**, the operation of relevant **Restoration Service Providers Plant** and **Apparatus** and the reconnection of **Demand** so as to establish a **Power Island**. During this period, the **Network Operator** or **Distribution Restoration Control System** will manage the output of the relevant **Anchor Plant** and relevant **Restoration Service Providers' Plant** to the **Demand** prevailing in the **Power Island**, on the basis that it will (where practicable) seek to maintain the **Target Frequency**. Relevant **Restoration Service Providers** will (where reasonably practicable) shall seek to follow the requirements relating to **Reactive Power** (which may include the requirement to maintain a target voltage) set out in the **Distribution Restoration Zone Plan**.

(e) Operation in accordance with the **Distribution Restoration Zone Plan** will be terminated by **The Company** (by notifying the relevant **Users**) when appropriate to do so which would be dependent upon **System** conditions. Operation in accordance with the **Distribution Restoration Zone Plan** will also terminate in the circumstances provided for in OC9.4.7.6.2(a) if an agreement is not reached or if **The Company** states that it does not wish the remainder of the **Distribution Restoration Zone Plan** to apply.

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Commented [MA(P84): Suggested change for consistency.
AJ Response - Agree

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Commented [AMC85]: Is there a need to consider what happens when a plan is terminated – are there two options:
1 Termination after successful implementation as Power Islands are jointed
2 Termination without successful implementation, when I guess the AP turns off. AJ Response – If the DRZP is not successful it would not be terminated so I am not sure this is relevant. One for discussion.

OC9.4.7.7 Distribution Restoration Zone Operation

Following a **Total** or **Partial Shutdown** the following shall apply:

OC9.4.7.7.1 In England and Wales a **Distribution Restoration Zone** is activated where **The Company** issues **Emergency Instructions** to ~~one or more~~ the relevant **Network Operators** to re-energise a section of their disconnected ~~network~~**System** using relevant **Restoration Service Provider's Plant** and **Apparatus** to form one or more **Power Islands**. In Scotland the **Relevant Transmission Operator** will instruct the relevant **Network Operator**, following an instruction to do so from **The Company**.

OC9.4.7.7.2 It is imperative that where a **Network Operator** has a **Distribution Restoration Zone Plan** available for use, the **Anchor Plant** forming part of that **Distribution Restoration Zone** is capable of satisfying the requirements of CC.8.1 or ECC.6.3.5, as appropriate, and that the **Network Operator** has confirmed to **The Company** that the **Distribution Restoration Zone Plan** is ready to activate.

OC9.4.7.7.3 Where **The Company** wishes a **Network Operator** to ~~activate one or more~~ a **Distribution Restoration ZonesZone Plans**. **The Company** will issue an **Emergency Instruction** to that **Network Operator** for it to activate the relevant **Distribution Restoration Zone Plan**. In Scotland the instruction to a Scottish **Network Operator** to activate a **Scottish Distribution Restoration Zone Plan** would be undertaken by the relevant **Scottish Transmission Licensee**. For the avoidance of doubt, **The Company** will issue instructions to initiate **Black Start** in Scotland via STCP 06-1 which includes arrangements for the ~~establishment~~activation of Scottish **Distribution Restoration ZonesZone Plans**.

OC9.4.7.7.4 Upon receipt of an **Emergency Instruction** from **The Company** (or instruction from the relevant **Scottish Transmission Licensee**), the **Network Operator** will confirm and acknowledge receipt in accordance with the requirements of BC2.9.2 and start initiating the process to activate the **Distribution Restoration Zone Plan** in accordance with the **Distribution Restoration Zone Plan**.

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Commented [AMC86]: Is the expectation that NGESO will instruct the DNO to activate more than one DRZP simultaneously? AJ Response – This is possible (allowing for appropriate time). DNO networks are quite large so it is possible for two zoens to be established within a DNO network. It does of course depend if the DNO has signed up to two or more DRZP's and if they have the appropriate resource.

- OC9.4.7.7.5 Upon receipt of the **Emergency Instruction** from **The Company** (or instruction from the relevant **Scottish Transmission Licensee**) to the **Network Operator** to activate a **Distribution Restoration Zone Plan** as provided for in OC9.4.7.7.4, all instructions to relevant **Restoration Service Providers** party to the **Distribution Restoration Zone Plan** will be issued by the **Network Operator**. All instructions to **Restoration Service Providers** forming part of the **Distribution Restoration Zone** will be issued by the relevant **Network Operator**. The operation of the **Distribution Restoration Zone** will then continue in accordance with OC 9.4.7.7 and the **Distribution Restoration Zone Plan** until the **Distribution Restoration Zone Plan** can be terminated as provided for in that **Distribution Restoration Zone Plan**. From that point instructions to **Users** and **Restoration Service Providers** will revert back to the provisions of the Grid Code **Operating Codes** and **Balancing Codes**, as appropriate, covering normal operating conditions.
- OC9.4.7.7.6 Where **The Company** issues an **Emergency Instruction** (or in Scotland where a **Scottish Transmission Licensee** issues an instruction) to a **Network Operator** to activate a **Distribution Restoration Zone Plan**, the **Network Operator** will first issue instructions to the **Anchor Plant Owner** informing the **Anchor Plant Owner** of the requirement to prepare the **Anchor Plant** to re-energise a **Distribution Restoration Zone** (or part thereof) in accordance with the **Distribution Restoration Zone Plan**. The **Network Operator** in liaison with the **Anchor Plant Owner** will discuss when their **Anchor Plant** is expected to be available and ready to start re-energising the **Distribution Restoration Zone**. For the avoidance of doubt, the **Anchor Plant Owner** shall not start to re-energise the **Distribution Restoration Zone** until given a formal instruction by the **Network Operator** in accordance with OC9.4.7.7.12 and this instruction shall only be given once the **Network Operator** has configured its **System** and taken the necessary additional actions to prepare the **Distribution Restoration Zone** to be re-energised. This will include any automatic switching that takes place through the action of a **Distribution Restoration Zone Control System**.
- OC9.4.7.7.7 Following activation of the **Distribution Restoration Zone Plan** in accordance with OC9.4.7.7.6, the **Network Operator** will then issue instructions to other relevant **Restoration Service Providers** party to the **Distribution Restoration Zone Plan** to inform them that a **Distribution Restoration Zone Plan** has been activated and to prepare their **Plant** and **Apparatus** so that it is in a state of readiness for contributing to the further planned operation of the **Distribution Restoration Zone**. All relevant **Restoration Service Providers** will inform the **Network Operator** of the indicative time of when their **Plant** and **Apparatus** will be in a state of readiness to be re-energised and/or **Synchronised** to the **Distribution Restoration Zone**. Relevant **Restoration Service Providers** shall not start to re-energize or **Synchronise** to the **Distribution Restoration Zone** until given a formal instruction by the **Network Operator** in accordance with OC9.4.7.7.12. Such instructions would only be issued to relevant **Restoration Service Providers** other than the **Anchor Plant Owner** once the **Network Operator** has re-energised the **Distribution Restoration Zone** (or part thereof) by issuing instructions to the **Anchor Plant Owner** and the **Distribution Restoration Zone** is in a position to expand and supply more **Demand** in accordance with the **Distribution Restoration Zone Plan**. These instructions can also be issued automatically by a **Distribution Restoration Zone Control System**.
- OC9.4.7.7.8 The **Network Operator** shall inform **The Company** (and the relevant **Scottish Transmission Licensee** in the case of a **Scottish Distribution Restoration Zone**) advising that it has contacted the appropriate **Anchor Plant Owner** and **Restoration Service Providers** in accordance with the **Distribution Restoration Zone Plan** and provide an indicative time of when the **Distribution Restoration Zone** and associated **Plant** and **Apparatus** is ready to be re-energised and the expected time of when the **Anchor Plant Owner** is in a position to re-energise the **Distribution Restoration Zone** (or part thereof).

- OC9.4.7.7.9 In addition to the requirements of OC9.4.7.7.6 to OC9.4.7.7.8, the **Network Operator** shall start to reconfigure its **System** such that it is in an appropriate state of readiness to enable the **Anchor Plant Owner** to re-energise **Distribution Restoration Zone** (or part thereof) in accordance with the **Distribution Restoration Zone Plan**. To enable this process to take place, the **Network Operator** may need to change the topology and status of its **System** which may include but shall not be limited to changing the status of circuit breakers in addition to adjusting control system and **Protection** settings. Reconfiguration of the **Network Operator's System** prior to re-energisation of the **Distribution Restoration Zone**, may be achieved by instructions carried out by manual means, switching carried out remotely from the **Network Operators Control Centre** or via fully automatic means which could include a **Distribution Restoration Zone Control System**.
- OC9.4.7.7.10 Once the **Network Operator** has reconfigured its **System** and associated **Plant** and **Apparatus** (including but not limited to **Protection** and control system settings) it will contact the **Anchor Plant Owner** (which could also be achieved by the **Distribution Restoration Zone Control System**) to confirm the foregoing and agree a time for the **Anchor Plant Owner** to operate their **Plant** so as to re-energise the **Distribution Restoration Zone** (or part thereof). Where the **Anchor Plant Owner** or **Network Operator** needs to change the agreed re-energisation time as a result of an unforeseen event such as, but not limited to, a faulty item of **Plant** or **Apparatus**, safety issue or unavailability of personnel, the **Anchor Plant Owner** and/or **Network Operator** will agree a revised re-energisation time.
- OC9.4.7.7.11 The **Network Operator** will inform **The Company** (or relevant **Scottish Transmission Licensee** in the case of a **Scottish Distribution Restoration Zone**) of the time when the **Anchor Plant Owner** is scheduled to re-energise a section of the **Network Operator's System**. Should this scheduled time vary, the **Network Operator** will inform **The Company** (or relevant **Scottish Transmission Licensee** in the case of a **Scottish Distribution Restoration Zone**) as necessary and provide an indication of any revised re-energisation time and the reason for the change.
- OC9.4.7.7.12 At the agreed re-energisation time as detailed in OC.9.4.7.8.11, the **Network Operator** will contact the **Anchor Plant Owner** and issue an instruction to the **Anchor Plant Owner** to re-energise the **Distribution Restoration Zone** (or part thereof) unless this is achieved via fully automatic means which could include a **Distribution Restoration Zone Control System**. Following the issue of instructions to the **Anchor Plant Owner**, and successful re-energization of the **Distribution Restoration Zone** (or part thereof) the **Network Operator** will instruct other **Restoration Service Providers** in the **Distribution Restoration Zone** as part of the wider restoration phase which again could be achieved through fully automatic means using a **Distribution Restoration Zone Control System**.
- OC9.4.7.7.13 Once the **Distribution Restoration Zone** (or part thereof) has been re-energised and feeding some local **Demand** or controllable **Demand** provided by a relevant **Restoration Service Provider**, the **Anchor Plant Owner** will be required to follow instruction from the **Network Operator** (or via fully automatic means which could include a **Distribution Restoration Zone Control System**) as envisaged in the **Distribution Restoration Zone Plan**. The **Network Operator** and/or **Distribution Restoration Zone Control System** shall issue instructions to the **Anchor Plant Owner** as necessary to ensure the **Distribution Restoration Zone** continues to run in a stable manner. The **Network Operator** will restore additional **Demand** or instruct the relevant **Restoration Service Providers** to do so, when it is appropriate to do so. As part of this process, the **Network Operator** in coordination with the **Anchor Plant Owner** shall ensure risks to the **Network Operator's System** or the **Anchor Plant**, that could arise through disturbances in the **Distribution Restoration Zone**, are minimised as far as reasonably practicable. This may be assisted through a planned series of re-energisation steps within the **Distribution Restoration Zone**, taking account of the **Anchor Plant** capability and performance at this time.

Commented [MA(P87)]: As far as practicable AJ Response
– Agreed – happy with suggested text.

OC9.4.7.7.14 **Demand** within the **Distribution Restoration Zone** can be restored by manual or remote controlled switching, or automatically by a **Distribution Restoration Zone Control System**. If during the **Demand** restoration process any relevant **Restoration Service Providers Plant** or **Apparatus** cannot, because of the nature of the **Demand** being supplied, keep within its safe operating parameters, the relevant **Restoration Service Provider** shall inform the **Network Operator** without undue delay who in turn shall inform **The Company**. In the case of a **Distribution Restoration Zone** in Scotland the **Scottish Network Operator** shall inform the relevant **Scottish Transmission Licensee**.

The relevant **Network Operator** or **Distribution Restoration Zone Control System** will, where possible:

- i. Instruct relevant **Restoration Service Providers** to alter their **Demand**; or
- ii. will re-configure the **Distribution Restoration Zone**; or
- iii. will instruct the relevant **Restoration Service Provider** forming part of the **Distribution Restoration Zone** to re-configure its **System** in order to alleviate the problem.

The Company and **Network Operator** (and **Relevant Transmission Licensee** in Scotland) accepts that any decision to keep a relevant **Restoration Service Provider's Plant** or **Apparatus** operating, if outside its safe operating parameters, is one for the **Restoration Service Provider** concerned alone. **The Company**, the **Network Operator**, and the **Relevant Scottish Transmission Licensee** (for **Distribution Restoration Zones** in Scotland) accepts that the relevant **Restoration Service Provider's Plant** and **Apparatus** may have its operating point changed by the relevant **Restoration Service Provider** if it believes it is necessary for safety reasons (whether relating to personnel or **Plant** and/or **Apparatus**). If such a change is made without prior notice, then the relevant **Restoration Service Provider** shall inform the **Network Operator** as soon as reasonably practical.

OC9.4.7.7.15 To stabilise the voltage and **Frequency** of the **Network Operator's System** and increase the **Demand** supplied within the **Distribution Restoration Zone**, the **Network Operator** may need to instruct additional relevant **Restoration Service Providers** to **Synchronise** their **Plant** to the **Distribution Restoration Zone**, either via manual instruction or through the use of a **Distribution Restoration Zone Control System**. For the avoidance of doubt, the overall control of **System Frequency** during **Black Start** is the responsibility of **The Company**, although **The Company** will require **Transmission Licensees** in Scotland to manage the **Frequency** and voltage of **Power Islands** in Scotland as provided for in STCP 06-1 or **Network Operators** to manage the **Frequency** and voltage of **Distribution Restoration Zones**.

OC9.4.7.7.16 With the **Distribution Restoration Zone** operating as described in OC9.4.7.7.14 and OC9.4.7.7.15 and in accordance with the **Distribution Restoration Zone Plan**, the **Network Operator** shall then undertake a step by step process of re-energising more elements of its **System** by restoring auxiliary supplies to substations, other **Users** and the restoration of supplies to **Customers** in accordance with the **Distribution Restoration Zone Plan**. These steps may include energisation of parts of the **Transmission System** where provided for in the **Distribution Restoration Zone Plan**. During this phase, each relevant **Restoration Service Provider's Plant** and **Apparatus** is to be operated within its designed operational limits. The **Network Operator** and/or the **Distribution Restoration Zone Control System** shall ensure **Restoration Service Providers** are able (where applicable) to contribute to voltage and **Frequency** control and ensure that adequate positive and negative headroom is maintained on relevant **Plant** and **Apparatus** to enable the management of **Power Island** contingences. During this period, there may be a need to instruct relevant **Restoration Service Providers** to **Synchronise** additional **Plant** and **Apparatus**, or to change operating points of **Plant** and **Apparatus** already **Synchronised**, to balance the **Distribution Restoration Zone**.

OC9.4.7.7.17 As the **Distribution Restoration Zone** supports increasing **Demand**, and as implementation of the **Distribution Restoration Plan** progresses, the **Network Operator** may need to update the **Protection** and control settings as the need arises.

Commented [J(A88)]: AJ Response - Not sure about this – In the Grid code we have the definition of Synchronised but not Synchronise?

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Commented [MA(P89)]: use of a AJ Response - Agree

Commented [AMC90]: If this is the expectation then the GCode should make more references to NGET in the operational process.

I think this needs further consideration. AJ Response – Yes point noted and will be included in the next iteration of OC9 to include the ESRS work.

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OC9.4.7.7.18 Once the **Distribution Restoration Zone** is in stable operation, the **Network Operator** and/or **Distribution Restoration Zone Control System** shall ensure that that relevant **Restoration Service Provider's Plant and Apparatus** are operated with sufficient headroom to be able to contribute to voltage and **Frequency** control, and in accordance with the safe operating limits in accordance with OC9.4.7.8.14. This is an essential pre-requisite to enable the **Power Island** to withstand volatility in **Demand** and generation, **Network Operator** interaction or credible faults and disturbances.

OC9.4.7.7.19 Expansion of a **Distribution Restoration Zone** to a **Transmission** busbar and to wider parts of the **Transmission System** would fall under the **Distribution Restoration Zone Plan** and the requirements of OC9.5.

Expansion of Power Islands

OC9.4.7.8 **The Company** will instruct the relevant **Users** to expand **Power Islands** to achieve larger sub-systems.

OC9.4.7.9 As part of **Black Start**, each **Network Operator** which:-

(a) has an **Embedded Black Start Station** or an **Embedded HVDC System** or **Embedded DC Converter Station**, and which has established a **Power Island**, howsoever arising within its **User System** or with any **Embedded Power Stations** or **Embedded HVDC Systems** or **Embedded DC Converter Stations** within its **User System** which have become islanded, may in liaison with **The Company** sustain and expand these islands in accordance with the relevant provisions of OC9.5 which shall apply to this OC9.4 as if set out here. They in this instance, the arrangements would fall under the provisions of a **Local Joint Restoration Plan**; and/or

(b) has activated one or more **Distribution Restoration Zone Plans** upon instruction from **The Company** or **Relevant Scottish Transmission Licensee**, will notify **The Company** or the **Relevant Scottish Transmission Licensee** when the **Distribution Restoration Zone** is operational and supplying local **Demand**. The **Network Operator** in liaison with **The Company** or the **Relevant Scottish Transmission Licensee** may sustain and expand these **Power Islands** in accordance the **Distribution Restoration Zone Plan** with the relevant provisions of OC9.5 which shall apply to this OC9.4 as if set out here. In this instance, the arrangements would fall under the provisions of a **Distribution Restoration Zone Plan**.

In either case, the **Network Operator** will inform **The Company** and/or the **Relevant Scottish Transmission Licensee** of their actions and will not **Re-Synchronise** a **Power Island** formed under a **Local Joint Restoration Plan** or **Distribution Restoration Zone** formed under a **Distribution Restoration Zone Plan** to the **National Electricity Transmission System** or any **User's System** which is already **Synchronised** to the **National Electricity Transmission System** without **The Company's** agreement.

OC9.4.7.10 **Interconnection of Power Islands**

The Company will subsequently interconnect the expanded **Power Islands** detailed in OC9.4.7.8 and OC9.4.7.9 to form sub-systems which will then be connected to form an integrated system as detailed in OC9.5. This should eventually achieve the re-establishment of the **Total System**, or that part of the **Total System** subject to the **Partial Shutdown**, as the case may be. The interconnection of **Power Islands** and sub-systems will utilise the provisions of all or part of OC9.5 (**Re-Synchronisation of De-synchronised Islands**) and in such a situation, such provisions will be part of **Black Start**. In the case of multiple **Distribution Restoration Zones** existing in any one **Network Operator's System**, **The Company** may instruct the **Network Operator** may to interconnect them in accordance with OC9.5.6 and OC9.5.7.

Return the Total System Back to Normal Operation

Commented [AMC91]: Need to think about this. The DRZ can only be expanded in the context of the DRZP. If there was a need to energise a Transmission busbar wouldn't that simply be part of the DRZP rather than 'expansion' of the DRZ? AJ Response – Yes it would but we have to acknowledge that a DRZP will need to be expanded as it will always start with an Anchor Generator and section of DNO network. One for discussion.

Commented [AMC92]: Assuming DRZs are a subset of Power Islands, its not clear to me that they can be 'expanded' as there may not be the appropriate control facilities in place. The concept currently really relates to transmission assets that probably do have the required control / instrumentation etc.

I can see that they could DRZs could be joined together if so provided for in the Plan – AJ Response – This is an issue for ESO so should not be an issue for the DNO – happy to discuss.

Commented [AMC93]: Power Islands? AJ Response – Not sure I understand the issue here.

Commented [AMC94]: Ditto AJ Response – As above.

Commented [MA(P95)]: Is this not about expanding beyond the DRZP but before contacting an adjacent "power island" and therefore not needing synchronisation

Further clarity is needed as to what's in the scope of the DRZP and what is managed 'on the day' by the relevant control engineers. AJ Response – We need to discuss this – I can see it from both directions but if we change this clause we will also need to change the clause in a) above as well.

Commented [AMC96]: Power Islands? – AJ Response – No – it should be sub systems as Power islands are formed together to form subsystems.

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Commented [AMC97]: What's the difference between a Power Island and sub-system? AJ Response – A subsystem is two or more power islands joined together.

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OC9.4.7.11

The Company shall, as soon as reasonably practical, inform **Users** and the **BSCCo** when the **Total System** could return to normal operation. Any such determination by **The Company** does not mean that the provisions of Section G paragraph 3 (Black Start) of the **BSC** shall cease to apply.

In making the determination that the **Total System** could return to normal operation, **The Company**, would consider, amongst other things, the following areas:

- (a) the extent to which the **National Electricity Transmission System** is contiguous and energised;
- (b) the integrity and stability of the **National Electricity Transmission System** and its ability to operate in accordance with the **Licence Standards**;
- (c) the impact that returning to normal may have on transmission constraints and the corresponding ability to maximise the **Demand** connected; and
- (d) the volume of generation, **Electricity Storage** or **Demand** not connected to the **National Electricity Transmission System**; and
- (e) the functionality of normal communication systems (~~i.e.~~ electronic data communication facilities, **Control Telephony**, etc).

In the event that the **Balancing Mechanism** has been suspended, it will not resume until the start of the **Settlement Period** determined by the **BSC Panel** in accordance with paragraph G3.1.2(d)(i) of the **BSC**.

For the avoidance of doubt, until resumption of the **Balancing Mechanism**, **The Company** is likely to continue to issue **Emergency Instructions** in accordance with BC2.9.

Users shall use reasonable endeavours to submit **Physical notifications** ten hours prior to the start of the **Settlement Period** determined by the **BSC Panel** in accordance with paragraph G3.1.2(d)(i) of the **BSC** and as notified by **The Company** -to **Users**, in preparation for a return to normal operations.

In the event that the **Balancing Mechanism** has not been suspended and **The Company** has determined that the **Total System** has returned to normal operation, **The Company** shall inform **Users** and the **BSCCo** as soon as possible of the time and date at which (in **The Company's** determination) the **Total System** returned to normal operation.

Conclusion of Black Start

OC9.4.7.12

The provisions of this **OC9** shall cease to apply with effect from either:

- (a) Where the **Balancing Mechanism** was suspended, the start of the **Settlement Period** that the **Balancing Mechanism** resumed normal operation, as determined by the **BSC Panel** and notified by the **BSCCo** in accordance with the provisions of the **BSC**; or
- (b) Where the **Balancing Mechanism** was not suspended, the end of the **Settlement Period** determined and notified by the **BSCCo** (in accordance with the provisions of the **BSC**) and corresponding -to- the time and date that **The Company** determined that the **Total System** had returned to normal operation.

Externally Interconnected System Operators

OC9.4.7.13

~~During~~ ~~Unless an Interconnector has~~ a **Black Start Contract**, ~~The Company~~ will, pursuant to the **Interconnection Agreement** with **Externally Interconnected System Operators**, agree with **Externally Interconnected System Operators** when their transmission systems can be **Re-Synchronised** to the **Total System**, if they have become separated.

OC9.5 RE-SYNCHRONISATION OF DE-SYNCHRONISED ISLANDS

The provisions in this OC9.5 do not apply to the parts of the **Total System** that normally operate **Out of Synchronism** with the rest of the **National Electricity Transmission System**.

Further requirements, including the provision of information, applying to **Re-synchronisation** of **De-synchronised Islands** following any **Total Shutdown** or **Partial Shutdown** are detailed in OC9.5.6.

- OC9.5.1
- (a) Where parts of the **Total System** are **Out of Synchronism** with each other (each such part being termed a "**De-Synchronised Island**") but ~~where there is~~ **has been** no **Total Shutdown** or **Partial Shutdown**, **The Company** will instruct **Users** to regulate generation or **Demand**, as the case may be, to enable the **De-Synchronised Islands** to be **Re-Synchronised** and **The Company** will inform those **Users** when **Re-Synchronisation** has taken place.
 - (b) As part of that process, there may be a need to deal specifically with **Embedded** generation or storage in those **De-Synchronised Islands**. This OC9.5 provides for how such **Embedded** generation or storage should be dealt with. In Scotland, this OC9.5 also provides for how **Transmission** connected generation in **De-Synchronised Islands** should be dealt with.
 - (c) In accordance with the provisions of the **BC**, **The Company** may decide that, to enable **Re-Synchronisation**, it will issue **Emergency Instructions** in accordance with BC2.9 and it may be necessary to depart from normal **Balancing Mechanism** operation in accordance with **BC2** in issuing **Bid-Offer Acceptances**.
 - (d) The provisions of this OC9.5 shall also apply during a **Black Start** to the **Re-Synchronising** of parts of the **System** following a **Total** or **Partial Shutdown**, as indicated in OC9.4. In such cases, the provisions of ~~the~~ OC9.5 shall apply following completion and/or termination of the relevant **Local Joint Restoration Plan(s)** process as referred to in OC9.4.7.6.1.(f) or relevant **Distribution Restoration Zone Plans** processes as referred to in OC9.4.7.6.2(e).

OC9.5.2 OptionsIsland loading and generation data management

Generation in those **De-Synchronised Islands** may be dealt with in three different ways, more than one of which may be utilised in relation to any particular incident:-

OC9.5.2.1 Indirect Data

- (a) ~~In this section OC9.5.2.1, relevant loading and other operational parameters are exchanged indirectly between Generators and Network Operators via The Company.~~
- (b) **The Company**, each **Generator** with **Synchronised** (or connected and available to generate although not **Synchronised**) **Genset(s)**~~Gensets~~ in the **De-Synchronised Island** and the **Network Operator** whose **User System** forms all or part of the **De-Synchronised Island** shall exchange information as set out in this OC9.5.2.1.1 to enable **The Company** to issue a **Bid-Offer Acceptance** or an **Emergency Instruction** to that **Generator** in relation to its **Genset(s)**~~Gensets~~ in the **De-Synchronised Island** until **Re-Synchronisation** takes place, on the basis that ~~it~~ **the Generator** will (where practicable) seek to maintain the **Target Frequency**.
- (b) The information to **The Company** from the **Generator** will cover its relevant operational parameters as outlined in the **BC** and from **The Company** to the **Generator** will cover data on **Demand** and changes in **Demand** in the **De-Synchronised Island**.
- (c) The information from the **Network Operator** to **The Company** will comprise data of **Demand** in the **De-Synchronised Island**, including data on any constraints within the **De-Synchronised Island**.

Commented [AMC98]: These still seem like very strange titles for 'dealing with de-synchronised islands' – although (a) text is helpful addition AJ Response – This is existing text. We can however redraft it when we come to rewrite OC9 for ESRS.

(de) The Company will keep the Network Operator informed of the Bid-Offer Acceptances or Emergency Instructions it is issuing to Embedded ~~Genset(s)~~Gensets within the Network Operator's User System forming part of the De-Synchronised Island.

OC9.5.2.2 Direct Data

~~(a)~~ In this section OC9.5.2.2 relevant loading and other operational parameters are exchanged directly between **Generators** and **Network Operators**.

(b) The **Company** will issue an **Emergency Instruction** and/or a **Bid-Offer Acceptance**, to the **Generator** to "float" local **Demand** and maintain **Frequency** at **Target Frequency**. Under this instruction, the **Generator** will be required to regulate the output of its **Genset(s)** at the **Power Station** in question to the **Demand** prevailing in the **De-Synchronised Island** in which it is situated, until **Re-Synchronisation** takes place, on the basis that it will (where practicable) seek to maintain the **Target Frequency**.

(bc) The **Network Operator** is required to be in contact with the **Generator** at the **Power Station** ~~to so that the Network Operator can~~ supply data to the Generator on **Demand** changes within the **De-Synchronised Island**.

(de) If more than one **Genset** is **Synchronised** on the **De-Synchronised Island**, or is connected to the **De-Synchronised Island** and available to generate although not **Synchronised**, the **Network Operator** will need to liaise with **The Company** to agree which **Genset(s)** will be utilised to accommodate changes in **Demand** in the **De-Synchronised Island**. The **Network Operator** will then maintain contact with the relevant **Generator** (or **Generators**) in relation to that **Genset(s)**.

(ed) The **Generator** at the **Power Station** must contact the **Network Operator** if the level of **Demand** which it has been asked to meet as a result of the **Emergency Instruction** and/or **Bid-Offer Acceptance** to "float" and the detail on **Demand** passed on by the **Network Operator**, is likely to cause problems for safety reasons (whether relating to personnel or **Plant** and/or **Apparatus**) in the operation of its **Genset(s)**, in order that the **Network Operator** can alter the level of **Demand** which that **Generator** needs to arrange to meet. Any decision to operate outside any relevant parameters is one entirely for the **Generator**.

OC9.5.2.3 Distribution Restoration Zones

(a) Where a **Distribution Restoration Zone Plan** has been activated a **Network Operator** will issue instructions to the **Anchor Plant Owner**, and other **Restoration Service Providers** as required by the **Distribution Restoration Zone Plan**, to "float" local **Demand** and maintain **Frequency** at the **Target Frequency**. The relevant **Restoration Service Providers** shall set the operating points of their **Plant** and **Apparatus** to meet the **Demand** prevailing in the **De-Synchronised Island** in which it is situated, on the basis that it will (where practicable) seek to maintain the **Target Frequency** until **Re-Synchronisation** takes place.

(b) The **Network Operator** will request any other relevant operational parameters required from **Restoration Service Providers** ~~which will be necessary~~ for the operation of the **Distribution Restoration Zone**.

(c) The **Network Operator** will keep The Company (and Scottish Transmission Licensee where relevant) informed of the progress of activating the Distribution Restoration Zone Plan and running the Distribution Restoration Zone within the Network Operator's System. The **Network Operator** shall be in contact with the **Anchor Plant Owner** and other **Restoration Service Providers** to supply data on **Demand** changes within the **De-Synchronised Island Distribution Restoration Zone**.

(d) **Restoration Service Providers** must contact the **Network Operator** if the level of **Demand** which they have been asked to meet as a result of the instruction to "float", is likely to cause problems for safety reasons (whether relating to personnel or **Plant** and/or **Apparatus**) in the operation of its **Plant** and **Apparatus**, in order that the **Network Operator** can alter the level of **Demand** which the **Restoration Service Providers** need to meet. Any decision to operate **Restoration Service Providers Plant** and **Apparatus** outside any relevant parameters is one entirely for the relevant **Restoration Service Provider**.

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Commented [VG99]: Except in Scotland where it should be in contact with the Relevant Scottish Transmission Licensee??? AJ Response – Text updated

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OC9.5.2.4

Control Features

- (a) A system may be established in relation to a part of the **National Electricity Transmission System** and a **Network Operator's User System**, if agreed between **The Company** and the **Network Operator** and any relevant ~~Generator(s)~~**Generators**, whereby upon a defined fault(s) occurring, manual or automatic control features will operate to protect the **National Electricity Transmission System** and relevant **Network Operator's User System** and ~~Genset(s)~~**Gensets** and simplify the restoration of Demand in the **De-Synchronised Island**.
- (b) In agreeing the establishment of such a system of control features **The Company** will need to consider its impact on the operation of the **National Electricity Transmission System**.

OC9.5.2.45

Absence of Control Features System

If a system of control features under OC9.5.2.34 has not been agreed as part of an **OC9 De-Synchronised Island Procedure** under OC9.5.4 below, **The Company** may choose to utilise the procedures set out in OC9.5.2.1 or OC9.5.2.2, or may instruct the ~~Genset(s)~~**Gensets** (or some of them) in the **De-Synchronised Island** to **De-Synchronise**.

OC9.5.3

Choice Of Option

In relation to each of the methods set out in OC9.5.2, where a **De-Synchronised Island** has come into existence and where an **OC9 De-Synchronised Island Procedure** under OC9.5.4 has been agreed, **The Company**, the **Network Operator** and the relevant **Generator(s)** will operate in accordance with that **OC9 De-Synchronised Islands Procedure** unless **The Company** considers that the nature of the **De-Synchronised Island** situation is such that either:-

- (i) the **OC9 De-Synchronised Island Procedure** does not cover the situation; or
- (ii) the provisions of the **OC9 De-Synchronised Island Procedure** are not appropriate,

in which case **The Company** will instruct the relevant **Users** and the **Users** will comply with **The Company's** instructions (which in the case of **Generators** will relate to generation and in the case of **Network Operators** will relate to **Demand**).

- OC9.5.4 Agreeing Procedures
In relation to each relevant part of the **Total System**, **The Company**, the **Network Operator** and the relevant **Generator** will discuss and may agree a local procedure (an "**OC9 De-Synchronised Island Procedure**").
- OC9.5.4.1 Where ~~there is no relevant local procedure in place at 12th May 1997, or in the case where~~ the need for an **OC9 De-Synchronised Island Procedure** arises for the first time, the following provisions shall apply:
- (a) **The Company**, the **Network Operator(s)** and the relevant **Generator(s)** will discuss the need for, and the detail of, the **OC9 De-Synchronised Island Procedure**. As soon as the need for an **OC9 De-Synchronised Island Procedure** is identified by **The Company** or a **User**, and the party which identifies such a need will notify all affected **Users** (and **The Company**, if that party is a **User**), and **The Company** will initiate these discussions.
 - (b) Each **OC9 De-Synchronised Island Procedure** will be in relation to a specific **Grid Supply Point**, but if there is more than one **Grid Supply Point** between **The Company** and the **Network Operator** then the **OC9 De-Synchronised Island Procedure** may cover all relevant **Grid Supply Points**. In Scotland, the **OC9 De-Synchronised Island Procedure** may also cover parts of the **National Electricity Transmission System** connected to the **User's System(s)** and **Power Stations** directly connected to the **National Electricity Transmission System** which are also likely to form part of the **Power Island**.
 - (c) The **OC9 De-Synchronised Island Procedure** will:
 - (i) record which **Users** and which **User Sites** are covered by the **OC9 De-Synchronised Island Procedure**;
 - (ii) record which of the three methods set out in OC9.5 (or combination of the three) shall apply, with any conditions as to applicability being set out as well;
 - (iii) set out what is required from **The Company** and each **User** should a **De-Synchronised Island** arise;
 - (iv) set out what action should be taken if the **OC9 De-Synchronised Island Procedure** does not cover a particular set of circumstances and will reflect that in the absence of any specified action, the provisions of OC9.5.3 will apply;
 - (v) in respect of **Scottish Transmission Systems**, the **OC9 De-Synchronised Island Procedure** may be produced with and include obligations on the **Relevant Scottish Transmission Licensee(s)** ; and
 - (vi) in respect of **Scottish Transmission Systems**, where the **OC9 De-Synchronised Island Procedure** includes the establishment of a **De-synchronised Island**, describe the route for establishment of the **De-Synchronised Island**.~~(d) Each OC9 De-Synchronised Island Procedure shall be prepared by The Company to reflect the above discussions.~~
 - (d) Each **OC9 De-Synchronised Island procedure** shall be prepared by **The Company** to reflect the above discussions.
 - (e) Each page of the **OC9 De-Synchronised Island Procedure** shall bear a date of issue and the issue number.
 - (f) When an **OC9 De-Synchronised Island Procedure** is prepared, it shall be sent by **The Company** to the **Users** involved for confirmation of its accuracy.
 - (g) The **OC9 De-Synchronised Island Procedure** shall then be signed on behalf of **The Company** and on behalf of each relevant **User** by way of written confirmation of its accuracy.

- (h) Once agreed under this OC9.5.4-1, the procedure will become an **OC9 De-Synchronised Island Procedure** under the **Grid Code** and (subject to any change pursuant to this OC9) will apply between **The Company, Relevant Transmission Licensee** and the relevant **Users** as if it were part of the **Grid Code**.
- (i) Once signed, a copy will be distributed by **The Company** to each **User** which is a party accompanied by a note indicating the issue number and the date of implementation.
- (j) **The Company** and **Users** must make the **OC9 De-Synchronised Island Procedure** readily available to the relevant operational staff.
- (k) If a new **User** connects to the **Total System** and needs to be included with an existing **OC9 De-Synchronised Island Procedure**, **The Company** will initiate a discussion with that **User** and the **Users** which are parties to the relevant **OC9 De-Synchronised Island Procedure**. The principles applying to a new **OC9 De-Synchronised Island Procedure** under this OC9.5.4-1 shall apply to such discussions and to any consequent changes.
- (l) If **The Company**, or any **User** which is a party to an **OC9 De-Synchronised Island Procedure**, becomes aware that a change is needed to that **OC9 De-Synchronised Island Procedure**, it shall (in the case of **The Company**) initiate a discussion between **The Company** and the relevant **Users** to seek to agree the relevant change. The principles applying to establishing a new **OC9 De-Synchronised Island Procedure** under this OC9.5.4-1 shall apply to such discussions and to any consequent changes. If a **User** becomes so aware, it shall contact **The Company** who will then initiate such discussions.
- (m) If in relation to any discussions, agreement cannot be reached between **The Company** and the relevant **Users**, **The Company** will operate the **System** on the basis that it will discuss which of the three methods set out in OC9.5.2.1 to OC9.5.2.3 would be most appropriate at the time, if practicable. The complexities and uncertainties of recovery from a **De-Synchronised Island** means that **The Company** will decide, having discussed the situation with the relevant **Users** and taking into account the fact that the three methods may not cover the situation or be appropriate, the approach which is to be followed. **The Company** will instruct the relevant **Users** and the **Users** will comply with **The Company's** instructions as provided in OC9.5.3.

~~OC9.5.4.2 Where there is a relevant local procedure in place at 12th May 1997, the following provisions shall apply:~~

- ~~(a) The Company and the Network Operator and the relevant Generator(s) will discuss the existing procedure to see whether it is consistent with the principles set out in this OC9.5.~~
- ~~(b) If it is, then it shall become an OC9 De-Synchronised Island Procedure under this OC9, and the relevant provisions of OC9.5.4.1 shall apply.~~
- ~~(c) If it is not, then the parties will discuss what changes are needed to ensure that it is consistent, and once agreed the procedure will become an OC9 De-Synchronised Island Procedure under this OC9, and the relevant provisions of OC9.5.4.1 shall apply.~~
- ~~(d) If agreement cannot be reached between The Company and the relevant Users after a reasonable period of time, the existing procedure will cease to apply and The Company will operate the System on the basis that it will discuss which of the three methods set out in OC9.5.2.1 to OC9.5.2.3 would be most appropriate at the time, if practicable. The complexities and uncertainties of recovery from a De-Synchronised Island means that The Company will decide, having discussed the situation with the relevant Users and taking into account the fact that the three methods may not cover the situation or be appropriate, the approach which is to be followed. The Company will instruct the relevant Users and the Users will comply with The Company's instructions as provided in OC9.5.3.~~

- OC9.5.5 Where the **National Electricity Transmission System** is **Out of Synchronism** with the **Transmission System** of an **Externally Interconnected System Operator**, **The Company** will, pursuant to the **Interconnection Agreement** with that **Externally Interconnected System Operator**, agree with that **Externally Interconnected System Operator** when its **Transmission System** can be **Re-Synchronised** to the **National Electricity Transmission System**.
- OC9.5.6 Further requirements regarding **Re-synchronisation** of **De-synchronised Islands** following any **Total Shutdown** or **Partial Shutdown**
- Following any **Total Shutdown** or **Partial Shutdown**, **The Company** expects that it will be necessary to interconnect **Power Islands** utilising the provisions of OC9.5. The complexities and uncertainties of recovery from a **Total Shutdown** or **Partial Shutdown** requires the provisions of OC9.5 to be flexible, however, the strategies which **The Company** will, where practicable, be seeking to follow when **Re-synchronising De-synchronised Islands** following any **Total Shutdown** or **Partial Shutdown**, include the following:
- (a) the provision of supplies to appropriate **Power Stations** to facilitate their synchronisation as soon as practicable;
 - (b) energisation of a skeletal **National Electricity Transmission System**;
 - (c) the strategic restoration of **Demand** in co-ordination with relevant **Network Operators**.
 - (d) the activation by **Network Operators** of one or more **Distribution Restoration Zones** Plans upon instruction from **The Company** (or **Relevant Scottish Transmission Licensee**).
- As highlighted in OC9.4.3, during a **Total Shutdown** or **Partial Shutdown** and during the subsequent recovery, which includes any period during which the procedures in this OC9.5 apply, the **Licence Standards** may not apply and the **Total System** may be operated outside normal voltage and **Frequency** standards.
- OC9.5.7 To manage effectively and co-ordinate the restoration strategies of the **Total System** (any **Re-Synchronisation** of **De-Synchronised Islands**) following any **Total Shutdown** or **Partial Shutdown**, requires **The Company** and relevant **Users** to undertake certain planning activities as set out below:
- (a) **The Company** and **Network Operators** shall review on a regular basis the processes by which each **Power Island** will be interconnected. This is likely to cover an exchange of information regarding the typical size, location and timing requirements for **Demand** to be reconnected and also include details (ability to change/disable) of the low frequency trip relay settings of the **Demand** identified. There may also be a requirement for specific **Protection** settings to be used during **Black Start**.
 - (b) Each **Generator** shall provide to **The Company** information to assist **The Company** in the formulation of the restoration strategies of **Power Island** expansion. This information shall be provided in accordance with PC.A.5.7.
 - (c) Where a **Distribution Restoration Zone Plan** is to be established, the **Distribution Restoration Zone Plan** will include the formulation of how the **Distribution Restoration Zone** will be re-energized from its de-energised state.
- OC9.6 JOINT SYSTEM INCIDENT PROCEDURE
- OC9.6.1 A "**Joint System Incident**" is
- (a) an **Event**, wherever occurring (other than on an **Embedded Small Power Station** or **Embedded Medium Power Station**), which, in the opinion of **The Company** or a **User**, has or may have a serious and/or widespread effect.

- (b) In the case of an **Event** on a **User(s) System(s)** (other than on an **Embedded Small Power Station** or **Embedded Medium Power Station**), the effect must be on the **National Electricity Transmission System**, and in the case of an **Event** on the **National Electricity Transmission System**, the effect must be on a **User(s) System(s)** (other than on an **Embedded Small Power Station** or **Embedded Medium Power Station**).

Where an **Event** on a **User(s) System(s)** has or may have no effect on the **National Electricity Transmission System**, then such an **Event** does not fall within **OC9** and accordingly **OC9** shall not apply to it.

- OC9.6.2 (a) (i) Each **User** (other than **Generators** which only have **Embedded Small Power Stations** and/or **Embedded Medium Power Stations**) will provide in writing to **The Company**, and
- (ii) **The Company** will provide in writing to each **User** (other than **Generators** which only have **Embedded Small Power Stations** and/or **Embedded Medium Power Stations**), a telephone number or numbers at which, or through which, senior management representatives nominated for this purpose and who are fully authorised to make binding decisions on behalf of **The Company** or the relevant **User**, as the case may be, can be contacted day or night when there is a **Joint System Incident**.
- (b) The lists of telephone numbers will be provided in accordance with the timing requirements of the **Bilateral Agreement** and/or **Construction Agreement** with that **User**, prior to the time that a **User** connects to the **National Electricity Transmission System** and must be up-dated (in writing) as often as the information contained in them changes.
- OC9.6.3 Following notification of an **Event** under **OC7**, **The Company** or a **User**, as the case may be, will, if it considers necessary, telephone the **User** or **The Company**, as the case may be, on the telephone number referred to in OC9.6.2, to obtain such additional information as it requires.
- OC9.6.4 Following notification of an **Event** under **OC7**, and/or the receipt of any additional information requested pursuant to OC9.6.3, **The Company** or a **User**, as the case may be, will determine whether or not the **Event** is a **Joint System Incident**, and, if so, **The Company** and/or the **User** may set up an **Incident Centre** in order to avoid overloading the existing **The Company** or that **User's**, as the case may be, operational/control arrangements.
- OC9.6.5 Where **The Company** has determined that an **Event** is a **Joint System Incident**, **The Company** shall, as soon as possible, notify all relevant **Users** that a **Joint System Incident** has occurred and, if appropriate, that it has established an **Incident Centre** and the telephone number(s) of its **Incident Centre** if different from those already supplied pursuant to OC9.6.2.
- OC9.6.6 If a **User** establishes an **Incident Centre** it shall, as soon as possible, notify **The Company** that it has been established and the telephone number(s) of the **Incident Centre** if different from those already supplied pursuant to OC9.6.2.
- OC9.6.7 **The Company's Incident Centre** and/or the **User's Incident Centre** will not assume any responsibility for the operation of the **National Electricity Transmission System** or **User's System**, as the case may be, but will be the focal point in **The Company** or the **User**, as the case may be, for:
- (a) the communication and dissemination of information between **The Company** and the senior management representatives of **User(s)**; or
- (b) between the **User** and the senior management representatives of **The Company**, as the case may be,
- relating to the **Joint System Incident**. The term "**Incident Centre**" does not imply a specially built centre for dealing with **Joint System Incidents**, but is a communications focal point. During a **Joint System Incident**, the normal communication channels, for operational/control communication between **The Company** and **Users** will continue to be used.

- OC9.6.8 All communications between the senior management representatives of the relevant parties with regard to **The Company's** role in the **Joint System Incident** shall be made via **The Company's Incident Centre** if it has been established.
- OC9.6.9 All communications between the senior management representatives of **The Company** and a **User** with regard to that **User's** role in the **Joint System Incident** shall be made via that **User's Incident Centre** if it has been established.
- OC9.6.10 **The Company** will decide when conditions no longer justify the need to use its **Incident Centre** and will inform all relevant **Users** of this decision.
- OC9.6.11 Each **User** which has established an **Incident Centre** will decide when conditions no longer justify the need to use that **Incident Centre** and will inform **The Company** of this decision.

< END OF OPERATING CODE NO. 9 >

Extracts from BC2

BC2.5.4 Operation In The Absence Of Instructions From The Company

In the absence of any **Bid-Offer Acceptances**, **Ancillary Service** instructions issued pursuant to BC2.8 or **Emergency Instructions** issued pursuant to BC2.9:

- (a) as provided for in BC3, each **Synchronised Genset** producing **Active Power** must operate at all times in **Limited Frequency Sensitive Mode** (unless instructed in accordance with BC3.5.4 to operate in **Frequency Sensitive Mode**);
- (b) (i) in the absence of any MVar **Ancillary Service** instructions, the MVar output of each **Synchronised Genset** located **Onshore** should be 0 MVar upon **Synchronisation** at the circuit-breaker where the **Genset** is **Synchronised**. For the avoidance of doubt, in the case of a **Genset** located **Onshore** comprising of **Non-Synchronous Generating Units, Power Park Modules, HVDC Systems or DC Converters** the steady state tolerance allowed in CC.6.3.2(b) or ECC.6.3.2.4.4 may be applied
- (ii) In the absence of any MVar **Ancillary Service** instructions, the MVar output of each **Synchronised Genset** comprising **Synchronous Generating Units** located **Offshore** (which could be part of a **Synchronous Power Generating Module**) should be 0MVar at the **Grid Entry Point** upon **Synchronisation**. For the avoidance of doubt, in the case of a **Genset** located **Offshore** comprising of **Non-Synchronous Generating Units, Power Park Modules, HVDC Systems or DC Converters** the steady state tolerance allowed in CC.6.3.2(e) or ECC.6.3.2.5.1 or ECC.6.3.2.6.2 (as applicable) may be applied;
- (c) (i) subject to the provisions of 2.5.4(c) (ii) and 2.5.4 (c) (iii) below, the excitation system or the voltage control system of a **Genset** located **Offshore** which has agreed an alternative **Reactive Power** capability range under CC.6.3.2 (e) (iii) or ECC.6.3.2.5.2 or ECC.6.3.2.6.3 (as applicable) or a **Genset** located **Onshore**, unless otherwise agreed with **The Company**, must be operated only in its constant terminal voltage mode of operation with VAR limiters in service, with any constant **Reactive Power** output control mode or constant **Power Factor** output control mode always disabled, unless agreed otherwise with **The Company**. In the event of any change in **System** voltage, a **Generator** must not take any action to override automatic MVar response which is produced as a result of constant terminal voltage mode of operation of the automatic excitation control system unless instructed otherwise by **The Company** or unless immediate action is necessary to comply with **Stability Limits** or unless constrained by plant operational limits or safety grounds (relating to personnel or plant);

- (ii) In the case of all **Gensets** comprising **Non-Synchronous Generating Units, DC Converters, HVDC Systems and Power Park Modules** that are located **Offshore** and which have agreed an alternative **Reactive Power** capability range under CC.6.3.2 (e) (iii), or ECC.6.3.2.5.2 or ECC.6.3.2.6.3 (as applicable) or that are located **Onshore** only when operating below 20 % of the **Rated MW** output, the voltage control system shall maintain the ~~reactive-power~~**Reactive Power** transfer at the **Grid Entry Point** (or **User System Entry Point** if **Embedded**) to 0 MVar. For the avoidance of doubt, the relevant steady state tolerance allowed for **GB Generators** in CC.6.3.2(b) or CC.6.3.2 (e) and for **EU Generators** in ECC.6.3.2.4.4, ECC.6.3.2.5.1 and ECC.6.3.2.6.2 and ECC.6.3.2.8.2 may be applied. In the case of any such **Gensets** owned or operated by **GB Code Users** – comprising current source **DC Converter** technology or comprising **Power Park Modules** connected to the **Total System** by a current source **DC Converter** when operating at any power output, the voltage control system shall maintain the ~~reactive-power~~**Reactive Power** transfer at the **Grid Entry Point** (or **User System Entry Point** if **Embedded**) to 0 MVar. For the avoidance of doubt the relevant steady state tolerance allowed in CC.6.3.2(b) or CC.6.3.2 (c) (i) may be applied.
- (iii) In the case of all **Gensets** located **Offshore** which are not subject to the requirements of BC2.5.4 (c) (i) or BC2.5.4 (c) (ii) the control system shall maintain the **Reactive Power** transfer at the **Offshore Grid Entry Point** at 0MVar. For the avoidance of doubt the steady state tolerance allowed by CC.6.3.2 (e) or ECC.6.3.2.4.4, ECC.6.3.2.5.1 and ECC.6.3.2.6.2 may be applied.
- (d) In the absence of any MVar **Ancillary Service** instructions,
- (i) the MVar output of each **Genset** located **Onshore** should be 0 MVar immediately prior to **De-Synchronisation** at the circuit-breaker where the **Genset** is **Synchronised**, other than in the case of a rapid unplanned **De-Synchronisation** or in the case of a **Genset** comprising of **Power Generating Modules** and/or **Non-Synchronous Generating Units** and/or **Power Park Modules** and/or **HVDC Converters** or **DC Converters** which is operating at less than 20% of its **Rated MW** output where the requirements of BC2.5.4 (c) part (ii) apply, or;
- (ii) the MVar output of each **Genset** located **Offshore** should be 0MVar immediately prior to **De-Synchronisation** at the **Offshore Grid Entry Point**, other than in the case of a rapid unplanned **De-Synchronisation** or in the case of a **Genset** comprising of **Non-Synchronous Generating Units, Power Park Modules, HVDC Converters** or **DC Converters** which is operating at less than 20% of its **Rated MW** output and which has agreed an alternative **Reactive Power** capability range (for **GB Code Users**) under CC.6.3.2 (e) (iii) or ECC.6.3.2.4.4, ECC.6.3.2.5.1 and ECC.6.3.2.6.2 (for **EU Code Users**) where the requirements of BC2.5.4 (c) (ii) apply.
- (e) a **Generator** should at all times operate its **CCGT Units** in accordance with the applicable **CCGT Module Matrix**;
- (f) in the case of a **Range CCGT Module**, a **Generator** must operate that **CCGT Module** so that power is provided at the single **Grid Entry Point** identified in the data given pursuant to PC.A.3.2.1 or at the single **Grid Entry Point** to which **The Company** has agreed pursuant to BC1.4.2(f);
- (g) in the event of the **System Frequency** being above 50.3Hz or below 49.7Hz, **BM Participants** must not commence any reasonably avoidable action to regulate the input or output of any **BM Unit** in a manner that could cause the **System Frequency** to deviate further from 50Hz without first using reasonable endeavours to discuss the proposed actions with **The Company**. **The Company** shall either agree to these changes in input or output or issue a **Bid-Offer Acceptance** in accordance with BC2.7 to delay the change.
- (h) a **Generator** should at all times operate its **Power Park Units** in accordance with the applicable **Power Park Module Availability Matrix**.

BC2.5.5.1 In the event that a **BM Participant** in respect of a **BM Unit** with a **Demand Capacity** with a magnitude of less than 50MW in **NGET's Transmission Area** or less than 10MW in **SHETL's Transmission Area** or less than 30MW in **SPT's Transmission Area** or comprising **Generating Units** (as defined in the Glossary and Definitions and not limited by BC2.2) and/or **Power Generating Modules** and/or **CCGT Modules** and/or **Power Park Modules** at a **Small Power Station** notifies **The Company** at least 30 days in advance that from a specified **Operational Day** it will:

- (a) no longer submit **Bid-Offer Data** under BC1.4.2(d), then with effect from that **Operational Day** that **BM Participant** no longer has to meet the requirements of BC2.5.1 nor the requirements of CC.6.5.8(b) or ECC.6.5.8(b) (as applicable) in relation to that **BM Unit**. Also, with effect from that **Operational Day**, any defaulted **Physical Notification** and defaulted **Bid-Offer Data** in relation to that **BM Unit** arising from the **Data Validation, Consistency and Defaulting Rules** will be disregarded and the provisions of BC2.5.2 will not apply;
- (b) submit **Bid-Offer Data** under BC1.4.2(d), then with effect from that **Operational Day** that **BM Participant** will need to meet the requirements of BC2.5.1 and the requirements of CC.6.5.8(b) or ECC.6.5.8(b) (as applicable) in relation to that **BM Unit**.

BC2.5.5.2 In the event that a **BM Participant** in respect of a **BM Unit** with a **Demand Capacity** with a magnitude of 50MW or more in **NGET's Transmission Area** or 10MW or more in **SHETL's Transmission Area** or 30MW or more in **SPT's Transmission Area** or comprising **Generating Units** (as defined in the Glossary and Definitions and not limited by BC2.2) and/or **Power Generating Modules** and/or **CCGT Modules** and/or **Power Park Modules** at a **Medium Power Station** or **Large Power Station** notifies **The Company** at least 30 days in advance that from a specified **Operational Day** it will:

- (a) no longer submit **Bid-Offer Data** under BC1.4.2(d), then with effect from that **Operational Day** that **BM Participant** no longer has to meet the requirements of CC.6.5.8(b) or ECC.6.5.8(b) (as applicable) in relation to that **BM Unit**; Also, with effect from that **Operational Day**, any defaulted **Bid-Offer Data** in relation to that **BM Unit** arising from the **Data Validation, Consistency and Defaulting Rules** will be disregarded;
- (b) submit **Bid-Offer Data** under BC1.4.2(d), then with effect from that **Operational Day** that **BM Participant** will need to meet the requirements of CC.6.5.8(b) or ECC.6.5.8(b) (as applicable) in relation to that **BM Unit**.

BC2.6 COMMUNICATIONS

Electronic communications are always conducted in GMT. However, the input of data and display of information to **Users** and **The Company** and all other communications are conducted in London time.

BC2.6.1 Normal Communication With Control Points

- (a) With the exception of BC2.6.1(c) below, **Bid-Offer Acceptances** and, unless otherwise agreed with **The Company**, **Ancillary Service** instructions shall be given by automatic logging device and will be given to the **Control Point** for the **BM Unit**. For all **Planned Maintenance Outages** the provisions of BC2.6.5 will apply. For **Generating Units** (including **DC Connected Power Park Modules** (if relevant)) communications under **BC2** shall be by telephone unless otherwise agreed by **The Company** and the **User**.
- (b) **Bid-Offer Acceptances** and **Ancillary Service** instructions must be formally acknowledged immediately by the **BM Participant** (or the relevant person on its behalf) via the **Control Point** for the **BM Unit** or **Generating Unit** in respect of that **BM Unit** or that **Generating Unit**. The acknowledgement and subsequent confirmation or rejection, within two minutes of receipt, is normally given electronically by automatic logging device. If no confirmation or rejection is received by **The Company** within two minutes of the issue of the **Bid-Offer Acceptance**, then **The Company** will contact the **Control Point** for the **BM Unit** by telephone to determine the reason for the lack of confirmation or rejection. Any rejection must be given in accordance with BC2.7.3 or BC2.8.3.

- (c) In the event of a failure of the logging device or ~~aan outage of The Company~~**Company's** computer system—~~outage~~, **Bid-Offer Acceptances** and instructions will be given, acknowledged, and confirmed or rejected by telephone. The provisions of BC2.9.7 are also applicable.
- (d) In the event that in carrying out the **Bid-Offer Acceptances** or providing the **Ancillary Services**, or when operating at the level of the **Final Physical Notification Data** as provided in BC2.5.1, an unforeseen problem arises, caused on safety grounds (relating to personnel or plant), **The Company** must be notified without delay by telephone.
- (e) The provisions of BC2.5.3 are also relevant.
- (f) Submissions of revised MVAR capability may be made by facsimile transmission, using the format given in Appendix 3 to **BC2**.
- (g) Communication will normally be by telephone for any purpose other than **Bid-Offer Acceptances**, in relation to **Ancillary Services** or for revisions of MVAR Data.
- (h) Submissions of revised availability of **Frequency Sensitive Mode** may be made by facsimile transmission, using the format given in Appendix 4 to **BC2**. This process should only be used for technical restrictions to the availability of **Frequency Sensitive Mode**.

BC2.6.2 Communication With Control Points In Emergency Circumstances

The Company will issue **Emergency Instructions** direct to the **Control Point** for each **BM Unit** [or **Generating Unit**] in **Great Britain**. **Emergency Instructions** to a **Control Point** will normally be given by telephone (and will include an exchange of operator names).

BC2.6.3 Communication With Network Operators In Emergency Circumstances

The Company will issue **Emergency Instructions** direct to the **Network Operator** at each **Control Centre** in relation to actions including special actions as set out in BC1.7, actions in the categories set out under BC2.9.3.3, and **Demand Control actions**. **Emergency Instructions** to a **Network Operator** will normally be given by telephone (and will include an exchange of operator names). **OC6** contains further provisions relating to **Demand Control** instructions.

BC2.6.4 Communication With Externally Interconnected System Operators In Emergency Circumstances

The Company will issue **Emergency Instructions** directly to the **Externally Interconnected System Operator** at each **Control Centre**. **Emergency Instructions** to an **Externally Interconnected System Operator** will normally be given by telephone (and will include an exchange of operator names).

BC2.6.5 Communications During Planned Outages Of Electronic Data Communication Facilities

Planned Maintenance Outages will normally be arranged to take place during periods of low data transfer activity. Upon any such **Planned Maintenance Outage** in relation to a post **Gate Closure** period:-

- (a) **BM Participants** should operate in relation to any period of time in accordance with the **Physical Notification** prevailing at **Gate Closure** current at the time of the start of the **Planned Maintenance Outage** in relation to each such period of time. Such operation shall be subject to the provisions of BC2.5.1, which will apply as if set out in this BC2.6.5. No further submissions of **BM Unit Data** (other than data specified in BC1.4.2(c) and BC1.4.2(e)) should be attempted or **Generating Unit Data**. Plant failure or similar problems causing significant deviation from **Physical Notification** should be notified to **The Company** by the submission of a revision to **Export and Import Limits** in relation to the **BM Unit** or **Generating Unit** so affected;
- (b) during the outage, revisions to the data specified in BC1.4.2(c) and BC1.4.2(e) may be submitted. Communication between **Users Control Points** and **The Company** during the outage will be conducted by telephone;
- (c) **The Company** will issue **Bid-Offer Acceptances** by telephone; and

- (d) no data will be transferred from **The Company** to the **BMRA** until the communication facilities are re-established.
- (e) The provisions of BC2.9.7 may also be relevant.

BC2.7 BID-OFFER ACCEPTANCES

BC2.7.1 Acceptance Of Bids And Offers By The Company

Bid-Offer Acceptances may be issued to the **Control Point** at any time following **Gate Closure**. Any **Bid-Offer Acceptance** will be consistent with the **Dynamic Parameters** and **Export and Import Limits** of the **BM Unit** in so far as the **Balancing Mechanism** timescales will allow (see BC2.7.2).

- (a) **The Company** is entitled to assume that each **BM Unit** is available in accordance with the **BM Unit Data** submitted unless and until it is informed of any changes.
- (b) **Bid-Offer Acceptances** sent to the **Control Point** will specify the data necessary to define a MW profile to be provided (ramp rate break-points are not normally explicitly sent to the **Control Point**) and to be achieved consistent with the respective **BM Unit's Export and Import Limits** provided or modified under **BC1** or **BC2**, and **Dynamic Parameters** given under BC2.5.3 or, if agreed with the relevant **User**, such rate within those **Dynamic Parameters** as is specified by **The Company** in the **Bid-Offer Acceptances**.
- (c) All **Bid-Offer Acceptances** will be deemed to be at the current "**Target Frequency**", namely where a **Genset** is in **Frequency Sensitive Mode** they refer to target output at **Target Frequency**.
- (d) The form of and terms to be used by **The Company** in issuing **Bid-Offer Acceptances** together with their meanings are set out in Appendix 1 in the form of a non-exhaustive list of examples.

BC2.7.2 Consistency With Export And Import Limits And Dynamic Parameters

- (a) **Bid-Offer Acceptances** will be consistent with the **Export and Import Limits** provided or modified under **BC1** or **BC2** and the **Dynamic Parameters** provided or modified under **BC2**. **Bid-Offer Acceptances** may also recognise **Other Relevant Data** provided or modified under **BC1** or **BC2**.
- (b) In the case of consistency with **Dynamic Parameters** this will be limited to the time until the end of the **Settlement Period** for which **Gate Closure** has most recently occurred. If **The Company** intends to issue a **Bid-Offer Acceptance** covering a period after the end of the **Settlement Period** for which **Gate Closure** has most recently occurred, based upon the then submitted **Dynamic Parameters**, **Export and Import Limits**, and **Bid-Offer Data** applicable to that period, **The Company** will indicate this to the **BM Participant** at the **Control Point** for the **BM Unit**. The intention will then be reflected in the issue of a **Bid-Offer Acceptance** to return the **BM Unit** to its previously notified **Physical Notification** after the relevant **Gate Closure** provided the submitted data used to formulate this intention has not changed and subject to **System** conditions which may affect that intention. Subject to that, assumptions regarding **Bid-Offer Acceptances** may be made by **BM Participants** for **Settlement Periods** for which **Gate Closure** has not yet occurred when assessing consistency with **Dynamic Parameters** in **Settlement Periods** for which **Gate Closure** has occurred. If no such subsequent **Bid-Offer Acceptance** is issued, the original **Bid-Offer Acceptance** will include an instantaneous return to **Physical Notification** at the end of the **Balancing Mechanism** period.

BC2.7.3 Confirmation And Rejection Of Acceptances

Bid-Offer Acceptances may only be rejected by a **BM Participant** :

- (a) on safety grounds (relating to personnel or plant) as soon as reasonably possible and in any event within five minutes; or

- (b) because they are not consistent with the **Export and Import Limits** or **Dynamic Parameters** applicable at the time of issue of the **Bid-Offer Acceptance**.

A reason must always be given for rejection by telephone.

Where a **Bid-Offer Acceptance** is not confirmed within two minutes or is rejected, **The Company** will seek to contact the **Control Point** for the **BM Unit**. **The Company** must then, within 15 minutes of issuing the **Bid-Offer Acceptance**, withdraw the **Bid-Offer Acceptance** or log the **Bid-Offer Acceptance** as confirmed. **The Company** will only log a rejected **Bid-Offer Acceptance** as confirmed following discussion and if the reason given is, in **The Company's** reasonable opinion, not acceptable and **The Company** will inform the **BM Participant** accordingly.

BC2.7.4 Action Required From BM Participants

- (a) Each **BM Participant** in respect of its **BM Units** will comply in accordance with BC2.7.1 with all **Bid-Offer Acceptances** given by **The Company** with no more than the delay allowed for by the **Dynamic Parameters** unless the **BM Unit** has given notice to **The Company** under the provisions of BC2.7.3 regarding non-acceptance of a **Bid-Offer Acceptance**.
- (b) Where a **BM Unit's** input or output changes in accordance with a **Bid-Offer Acceptance** issued under BC2.7.1, such variation does not need to be notified to **The Company** in accordance with BC2.5.1.
- (c) In the event that while carrying out the **Bid-Offer Acceptance** an unforeseen problem arises caused by safety reasons (relating to personnel or plant), **The Company** must be notified immediately by telephone and this may lead to revision of **BM Unit Data** in accordance with BC2.5.3

BC2.7.5 Additional Action Required when responding to Bid-Offer Acceptances

- (a) When complying with **Bid-Offer Acceptances** for a **CCGT Module** a **Generator** will operate its **CCGT Units** in accordance with the applicable **CCGT Module Matrix**.
- (b) When complying with **Bid-Offer Acceptances** for a **CCGT Module** which is a **Range CCGT Module**, a **Generator** must operate that **CCGT Module** so that power is provided at the single **Grid Entry Point** identified in the data given pursuant to PC.A.3.2.1 or at the single **Grid Entry Point** to which **The Company** has agreed pursuant to BC1.4.2 (f).
- (c) On receiving a new MW **Bid-Offer Acceptance**, no tap changing shall be carried out to change the MVA_r output unless there is a new MVA_r **Ancillary Service** instruction issued pursuant to BC2.8.
- (d) When complying with **Bid-Offer Acceptances** for a **Power Park Module** a **Generator** will operate its **Power Park Units** in accordance with the applicable **Power Park Module Availability Matrix**.
- (e) When complying with **Bid-Offer Acceptances** for a **Synchronous Power Generating Module** a **Generator** will operate its **Generating Units** in accordance with the applicable **Synchronous Power Generating Module Availability Matrix**.
- (f) When complying with **Bid-Offer Acceptances** for an **Additional BM** unit or **Secondary BM Unit** they will operate in accordance with the applicable **Aggregator Impact Matrix**.

BC2.8 ANCILLARY SERVICES

This section primarily covers the call-off of **System Ancillary Services**. The provisions relating to **Commercial Ancillary Services** will normally be covered in the relevant **Ancillary Services Agreement**.

BC2.8.1 Call-Off Of Ancillary Services By The Company

- (a) **Ancillary Service** instructions may be issued at any time.
- (b) **The Company** is entitled to assume that each **BM Unit** (or **Generating Unit**) is available in accordance with the **BM Unit Data** (or the **Generating Unit Data**) and data contained in the **Ancillary Services Agreement** unless and until it is informed of any changes.
- (c) **Frequency** control instructions may be issued in conjunction with, or separate from, a **Bid-Offer Acceptance**.
- (d) The form of and terms to be used by **The Company** in issuing **Ancillary Service** instructions together with their meanings are set out in Appendix 2 in the form of a non-exhaustive list of examples including **Reactive Power** and associated instructions.
- (e) In the case of **Generating Units** that do not form part of a **BM Unit** any change in **Active Power** as a result of, or required to enable, the provision of an **Ancillary Service** will be dealt with as part of that **Ancillary Service Agreement** and/or provisions under the **CUSC**.
- (f) A **System to Generator Operational Intertipping Scheme** will be armed in accordance with BC2.10.2(a).

BC2.8.2 Consistency With Export And Import Limits And Dynamic Parameters

Ancillary Service instructions will be consistent with the **Export and Import Limits** provided or modified under **BC1** or **BC2** and the **Dynamic Parameters** provided or modified under **BC2**. **Ancillary Service** instructions may also recognise **Other Relevant Data** provided or modified under **BC1** or **BC2**.

BC2.8.3 Rejection Of Ancillary Service Instructions

- (a) **Ancillary Service** instructions may only be rejected, by automatic logging device or by telephone, on safety grounds (relating to personnel or plant) or because they are not consistent with the applicable **Export and Import Limits**, **Dynamic Parameters**, **Other Relevant Data** or data contained in the **Ancillary Services Agreement** and a reason must be given immediately for non-acceptance.
- (b) The issue of **Ancillary Service** instructions for **Reactive Power** will be made with due regard to any resulting change in **Active Power** output. The instruction may be rejected if it conflicts with any **Bid-Offer Acceptance** issued in accordance with BC2.7 or with the **Physical Notification**.
- (c) Where **Ancillary Service** instructions relating to **Active Power** and **Reactive Power** are given together, and to achieve the **Reactive Power** output would cause the **BM Unit** to operate outside **Dynamic Parameters** as a result of the **Active Power** instruction being met at the same time, then the timescale of implementation of the **Reactive Power** instruction may be extended to be no longer than the timescale for implementing the **Active Power** instruction but in any case to achieve the MVAR **Ancillary Service** instruction as soon as possible.

BC2.8.4 Action Required From BM Units

- (a) Each **BM Unit** (or **Generating Unit**) will comply in accordance with BC2.8.1 with all **Ancillary Service** instructions relating to **Reactive Power** properly given by **The Company** within 2 minutes or such longer period as **The Company** may instruct, and all other **Ancillary Service** instructions without delay, unless the **BM Unit** or **Generating Unit** has given notice to **The Company** under the provisions of BC2.8.3 regarding non-acceptance of **Ancillary Service** instructions.
- (b) Each **BM Unit** may deviate from the profile of its **Final Physical Notification Data**, as modified by any **Bid-Offer Acceptances** issued in accordance with BC2.7.1, only as a result of responding to **Frequency** deviations when operating in **Frequency Sensitive Mode** in accordance with the **Ancillary Services Agreement**.

- (c) Each **Generating Unit** that does not form part of a **BM Unit** may deviate from the profile of its **Final Physical Notification Data** where agreed by **The Company** and the **User**, including but not limited to, as a result of providing an **Ancillary Service** in accordance with the **Ancillary Service Agreement**.
- (d) In the event that while carrying out the **Ancillary Service** instructions an unforeseen problem arises caused by safety reasons (relating to personnel or plant), **The Company** must be notified immediately by telephone and this may lead to revision of **BM Unit Data** or **Generating Unit Data** in accordance with BC2.5.3.

BC2.8.5 Reactive Despatch Network Restrictions

Where **The Company** has received notification pursuant to the Grid Code that a **Reactive Despatch to Zero MVar Network Restriction** is in place with respect to any **Embedded Power Generating Module** and/or **Embedded Generating Unit** and/or **Embedded Power Park Module** or **HVDC Converter** at an **Embedded HVDC Converter Station** or **DC Converter** at an **Embedded DC Converter Station**, then **The Company** will not issue any **Reactive Despatch Instruction** with respect to that **Power Generating Module** and/or **Generating Unit** and/or **Power Park Module** or **DC Converter** or **HVDC Converter** until such time as notification is given to **The Company** pursuant to the Grid Code that such **Reactive Despatch to Zero MVar Network Restriction** is no longer affecting that **Power Generating Module** and/or **Generating Unit** and/or **Power Park Module** or **DC Converter** or **HVDC Converter**.

BC2.9 EMERGENCY CIRCUMSTANCES

BC2.9.1 Emergency Actions

BC2.9.1.1 In certain circumstances (as determined by **The Company** in its reasonable opinion) it will be necessary, in order to preserve the integrity of the **National Electricity Transmission System** and any synchronously connected **External System**, for **The Company** to issue **Emergency Instructions**. In such circumstances, it may be necessary to depart from normal **Balancing Mechanism** operation in accordance with BC2.7 in issuing **Bid-Offer Acceptances**. **BM Participants** must also comply with the requirements of **BC3**.

BC2.9.1.2 Examples of circumstances that may require the issue of **Emergency Instructions** include:-

- (a) **Events** on the **National Electricity Transmission System** or the **System** of another **User**; or
- (b) the need to maintain adequate **System** and **Localised NRAM** in accordance with BC2.9.4 below; or
- (c) the need to maintain adequate frequency sensitive **Gensets** in accordance with BC2.9.5 below; or
- (d) the need to implement **Demand Control** in accordance with OC6; or
- (e) (i) the need to invoke the **Black Start** process or the **Re-Synchronisation of De-Synchronised Island** process or **Distribution Restoration Zone Plans** in accordance with OC9; or
- (ii) the need to request provision of a **Maximum Generation Service**; or
- (iii) the need to issue an **Emergency Deenergisation Instruction** in circumstances where the condition or manner of operation of any **Transmission Plant** and/or **Apparatus** is such that it may cause damage or injury to any person or to the **National Electricity Transmission System**.

BC2.9.1.3 In the case of **BM Units** and **Generating Units** in Great Britain, **Emergency Instructions** will be issued by **The Company** direct to the **User** at the **Control Point** for the **BM Unit** or **Generating Unit** and may require an action or response which is outside its **Other Relevant Data** or **Export and Import Limits** submitted under **BC1**, or revised under **BC1** or **BC2**, or **Dynamic Parameters** submitted or revised under **BC2**.

BC2.9.1.4 In the case of a **Network Operator** or an **Externally Interconnected System Operator**, **Emergency Instructions** will be issued to its **Control Centre**.

BC2.9.2 Implementation Of Emergency Instructions

BC2.9.2.1 **Users** will respond to **Emergency Instructions** issued by **The Company** without delay and using all reasonable endeavours to so respond. **Emergency Instructions** may only be rejected by an **User** on safety grounds (relating to personnel or plant) and this must be notified to **The Company** immediately by telephone.

BC2.9.2.2 **Emergency Instructions** will always be prefixed with the words "This is an **Emergency Instruction**" except in the case of:

- (i) **Maximum Generation Service** instructed by electronic data communication facilities where the instruction will be issued in accordance with the provisions of the **Maximum Generation Service Agreement**; and
- (ii) an **Emergency Deenergisation Instruction**, where the **Emergency Deenergisation Instruction** will be pre-fixed with the words 'This is an **Emergency Deenergisation Instruction**'; and
- (iii) during a **Black Start** situation where the **Balancing Mechanism** has been suspended, any instruction given by **The Company** will (unless **The Company** specifies otherwise) be deemed to be an **Emergency Instruction** and need not be pre-fixed with the words 'This is an **Emergency Instruction**'; and

- (iv) during a **Black Start situation**—where the **Balancing Mechanism** has not been suspended, any instruction in relation to **Black Start Stations**, **Black Start HVDC Systems** and to **Network Operators** which are part of an invoked **Local Joint Restoration Plan** will (unless **The Company** specifies otherwise) be deemed to be an **Emergency Instruction** and need not be prefixed with the words 'This is an **Emergency Instruction**'. Equally during a Black Start where the Balancing Mechanism has not been suspended, any instruction to Network Operators which are part of an activated Distribution Restoration Zone Plan will (unless The Company specifies otherwise) be deemed to be an Emergency Instruction and need not be prefixed with the words 'This is an Emergency Instruction'.

In Scotland, any instruction from the Relevant Transmission Licensee in relation to **Gensets** that are not at **Black Start Stations** or to **HVDC Systems** or **DC Converter Stations** that are not part of **Black Start HVDC Systems**, but which are part of an invoked **Local Joint Restoration Plan** and are instructed in accordance with the provisions of that **Local Joint Restoration Plan**, will be deemed to be an **Emergency Instruction** and need not be prefixed with the words 'This is an **Emergency Instruction**'. Equally any instruction from the Relevant Transmission Licensee to Network Operators who are part of an activated Distribution Restoration Zone Plan and are instructed in accordance with the provisions of that Distribution Restoration Zone Plan, will be deemed to be an Emergency Instruction.

BC2.9.2.3 In all cases under this BC2.9 except BC2.9.1.2 (e) where **The Company** issues an **Emergency Instruction** to a **BM Participant** which is not rejected under BC2.9.2.1, the **Emergency Instruction** shall be treated as a **Bid-Offer Acceptance**. For the avoidance of doubt, any **Emergency Instruction** issued to a **Network Operator** or to an **Externally Interconnected System Operator** or in respect of a **Generating Unit** that does not form part of a **BM Unit**, will not be treated as a **Bid-Offer Acceptance**.

BC2.9.2.4 In the case of BC2.9.1.2 (e) (ii) where **The Company** issues an **Emergency Instruction** pursuant to a **Maximum Generation Service Agreement** payment will be dealt with in accordance with the **CUSC** and the **Maximum Generation Service Agreement**.

BC2.9.2.5 In the case of BC2.9.1.2 (e) (iii) where **The Company** issues an **Emergency Deenergisation Instruction** payment will be dealt with in accordance with the **CUSC**, Section 5.

BC2.9.2.6 In the of BC2.9.1.2 (e) (i) upon receipt of an **Emergency Instruction** by a **Generator** during a **Black Start** the provisions of Section G of the **BSC** relating to compensation shall apply.

Commented [AMC100]: Delete as the instruction could by definition not be an Emergency Instruction as it wouldn't have been issued by The Company. AJ Response – Text deleted – Just need to make sure Alan is happy with this.

BC2.9.3 Examples of Emergency Instructions

BC2.9.3.1 In the case of a **BM Unit** or a **Generating Unit**, **Emergency Instructions** may include an instruction for the **BM Unit** or the **Generating Unit** to operate in a way that is not consistent with the **Dynamic Parameters** and/or **Export and Import Limits**.

BC2.9.3.2 In the case of a **Generator**, **Emergency Instructions** may include:

- (a) an instruction to trip one or more **Gensets** (excluding **Operational Intertipping**); or
- (b) an instruction to trip **Mills** or to **Part Load** a **Generating Unit** (as defined in the Glossary and Definitions and not limited by BC2.2); or
- (c) an instruction to **Part Load** a **Power Generating Module** and/or **CCGT Module** or **Power Park Module**; or
- (d) an instruction for the operation of **CCGT Units** within a **CCGT Module** (on the basis of the information contained within the **CCGT Module Matrix**) when emergency circumstances prevail (as determined by **The Company** in **The Company's** reasonable opinion); or
- (e) an instruction to generate outside normal parameters, as allowed for in 4.2 of the **CUSC**; or
- (f) an instruction for the operation of **Generating Units** within a **Cascade Hydro Scheme** (on the basis of the additional information supplied in relation to individual **Generating Units**) when emergency circumstances prevail (as determined by **The Company** in **The Company's** reasonable opinion); or
- (g) an instruction for the operation of a **Power Park Module** (on the basis of the information contained within the **Power Park Module Availability Matrix**) when emergency circumstances prevail (as determined by **The Company** in **The Company's** reasonable opinion).

BC2.9.3.3 Instructions to **Network Operators** relating to the **Operational Day** may include:

- (a) a requirement for **Demand** reduction and disconnection or restoration pursuant to **OC6**;
- (b) an instruction to effect a load transfer between **Grid Supply Points**;
- (c) an instruction to switch in a **System to Demand Intertrip Scheme**;
- (d) an instruction to split a network;
- (e) an instruction to disconnect an item of **Plant** or **Apparatus** from the **System**.
- (f) until October 25 2020, an instruction requiring a **Network Operator** to disconnect **Embedded Power Stations** from their **System**. For the avoidance of doubt, this includes the disconnection of **Embedded Power Station(s)Stations** connected to the **Network Operator's System** which are owned or operated by generators that are not **BM Participants**. Such an instruction may:
 - i) be specific and require the **Network Operator** to disconnect specified **Embedded Power Station(s)Stations**;
 - ii) be for the **Network Operator** to disconnect **Embedded Power Stations** supplied via one or more specified **Grid Supply Point(s)Points** with an aggregate **Registered Capacity** of a specified value; or
 - iii) be for the **Network Operator** to disconnect **Embedded Power Stations** supplied via —one or more specified **Grid Supply Point(s)Points** such that a specified proportion of the aggregate **Registered Capacity** is disconnected.

(g) an instruction to activate a **Distribution Restoration Zone Plan** as provided for in **OC9.4.7.6.2**.

In ~~any such~~the case of BC2.9.3.3(f), the **Network Operator** will not be required to disconnect **Embedded Power Stations** with an aggregated **Registered Capacity** greater than that of

the **Embedded Power Stations** supplied via the specified **Grid Supply Point(s)**. An instruction from **The Company** to the **Network Operator** will be given to commence reconnection. Reconnection shall not take place until such an instruction has been received and be carried out in accordance with the instruction.

- BC2.9.4 Maintaining Adequateadequate System Andand Localised NRAPM (Negative Reserve Active Power Margin)
- BC2.9.4.1 Where **The Company** is unable to satisfy the required **System NRAPM** or **Localised NRAPM** by following the process described in BC1.5.5, **The Company** will issue an **Emergency Instruction** to exporting **BM Units** for **De-Synchronising** on the basis of **Bid-Offer Data** submitted to **The Company** in accordance with BC1.4.2(d). If **The Company** is still unable to satisfy the required **System NRAPM** or **Localised NRAPM** then **The Company** may issue **Emergency Instructions** to **Network Operator(s)Operators** as set out under BC2.9.3.3(f) to disconnect **Embedded Power Station(s)Stations** from their **System**.
- BC2.9.4.2 In the event that **The Company** is unable to differentiate between exporting **BM Units** according to **Bid-Offer Data**, **The Company** will instruct a **BM Participant** to **Shutdown** a specified exporting **BM Unit** for such period based upon the following factors:
- (a) effect on power flows (resulting in the minimisation of transmission losses);
 - (b) reserve capability;
 - (c) **Reactive Power** worth;
 - (d) **Dynamic Parameters**;
 - (e) in the case of **Localised NRAPM**, effectiveness of output reduction in the management of the **System Constraint**.
- BC2.9.4.3 Where **The Company** is still unable to differentiate between exporting **BM Units**, having considered all the foregoing, **The Company** will decide which exporting **BM Unit** to **Shutdown** by the application of a quota for each **BM Participant** in the ratio of each **BM Participant's Physical Notifications**.
- BC2.9.4.4 Other than as provided in BC2.9.4.5 and BC2.9.4.6 below, in determining which exporting **BM Units** to **De-Synchronise** under this BC2.9.4, **The Company** shall not consider in such determination (and accordingly shall not instruct to **De-Synchronise**) any **Generating Unit** (as defined in the Glossary and Definitions and not limited by BC2.2) within an **Existing Gas Cooled Reactor Plant**.
- BC2.9.4.5 **The Company** shall be permitted to instruct a **Generating Unit** (as defined in the Glossary and Definitions and not limited by BC2.2) within an **Existing AGR Plant** to **De-Synchronise** if the relevant **Generating Unit** within the **Existing AGR Plant** has failed to offer to be flexible for the relevant instance at the request of **The Company** within the **Existing AGR Plant Flexibility Limit**.
- BC2.9.4.6 Notwithstanding the provisions of BC2.9.4.5 above, if the level of **System NRAPM** (taken together with **System** constraints) or **Localised NRAPM** is such that it is not possible to avoid instructing a **Generating Unit** (as defined in the Glossary and Definitions and not limited by BC2.2) within an **Existing Magnox Reactor Plant** and/or an **Existing AGR Plant** whether or not it has met requests within the **Existing AGR Flexibility Limit** to **De-Synchronise The Company** may, provided the power flow across each **External Interconnection** is either at zero or results in an export of power from the **Total System**, so instruct a **Generating Unit** (as defined in the Glossary and Definitions and not limited by BC2.2) within an **Existing Magnox Reactor Plant** and/or an **Existing AGR Plant** to **De-Synchronise** in the case of **System NRAPM**, in all cases and in the case of **Localised NRAPM**, when the power flow would have a relevant effect.

BC2.9.4.7 When instructing exporting **BM Units** which form part of an **On-Site Generator Site** to reduce generation or export under this BC2.9.4, **The Company** will not issue an instruction which would reduce generation or export below the reasonably anticipated **Demand** of the **On-Site Generator Site**. For the avoidance of doubt, it should be noted that the term "**On-Site Generator Site**" only relates to Trading Units which have fulfilled the Class 1 or Class 2 requirements.

BC2.9.5 Maintaining Adequate Frequency Sensitive Generation

BC2.9.5.1 If, post **Gate Closure**, **The Company** determines, in its reasonable opinion, from the information then available to it (including information relating to a **Generating Unit** (as defined in the Glossary and Definitions and not limited by BC2.2) breakdown) that the number of and level of **Primary**, **Secondary** and **High Frequency Response** available from **Gensets** (other than those units within **Existing Gas Cooled Reactor Plant**, which are permitted to operate in **Limited Frequency Sensitive Mode** at all times under BC3.5.3) available to operate in **Frequency Sensitive Mode** is such that it is not possible to avoid **De-Synchronising Existing Gas Cooled Reactor Plant** then provided that:

- (a) there are (or, as the case may be, that **The Company** anticipates, in its reasonable opinion, that at the time that the instruction is to take effect there will be) no other **Gensets** generating and exporting on to the **Total System** which are not operating in **Frequency Sensitive Mode** (or which are operating with only a nominal amount in terms of level and duration) (unless, in **The Company's** reasonable opinion, necessary to assist the relief of **System** constraints or necessary as a result of other **System** conditions); and
- (b) the power flow across each **External Interconnection** is (or, as the case may be, is anticipated to be at the time that the instruction is to take effect) either at zero or results in an export of power from the **Total System**,

then **The Company** may instruct such of the **Existing Gas Cooled Reactor Plant** to **De-Synchronise** as it is, in **The Company's** reasonable opinion, necessary to **De-Synchronise** and for the period for which the **De-Synchronising** is, in **The Company's** reasonable opinion, necessary.

BC2.9.5.2 If in **The Company's** reasonable opinion it is necessary for both the procedure in BC2.9.4 and that set out in BC2.9.5.1 to be followed in any given situation, the procedure in BC2.9.4 will be followed first, and then the procedure set out in BC2.9.5.1. For the avoidance of doubt, nothing in this sub-paragraph shall prevent either procedure from being followed separately and independently of the other.

BC2.9.6 Emergency Assistance To And From External Systems

- (a) An **Externally Interconnected System Operator** (in its role as operator of the **External System**) may request that **The Company** takes any available action to increase the **Active Energy** transferred into its **External System**, or reduce the **Active Energy** transferred into the **National Electricity Transmission System** by way of emergency assistance if the alternative is to instruct a demand reduction on all or part of its **External System** (or on the system of an **Interconnector User** using its **External System**). Such request must be met by **The Company** providing this does not require a reduction of **Demand** on the **National Electricity Transmission System**, or lead to a reduction in security on the **National Electricity Transmission System**.
- (b) **The Company** may request that an **Externally Interconnected System Operator** takes any available action to increase the **Active Energy** transferred into the **National Electricity Transmission System**, or reduce the **Active Energy** transferred into its **External System** by way of emergency assistance if the alternative is to instruct a **Demand** reduction on all or part of the **National Electricity Transmission System**. Such request must be met by the **Externally Interconnected System Operator** providing this does not require a reduction of **Demand** on its **External System** (or on the system of **Interconnector Users** using its **External System**), or lead to a reduction in security on such **External System** or system.

BC2.9.7 Unplanned Outages Of Electronic Communication And Computing Facilities

BC2.9.7.1 In the event of an unplanned outage of the electronic data communication facilities or of **The Company's** associated computing facilities or in the event of a **Planned Maintenance Outage** lasting longer than the planned duration, in relation to a post-**Gate Closure** period **The Company** will, as soon as it is reasonably able to do so, issue a **The Company** Computing System Failure notification by telephone or such other means agreed between **Users** and **The Company** indicating the likely duration of the outage.

BC2.9.7.2 During the period of any such outage, the following provisions will apply:

- (a) **The Company** will issue further **The Company** Computing System Failure notifications by telephone or such other means agreed between **Users** and **The Company** to all **BM Participants** to provide updates on the likely duration of the outage;
- (b) **BM Participants** should operate in relation to any period of time in accordance with the **Physical Notification** prevailing at **Gate Closure** current at the time of the computer system failure in relation to each such period of time. Such operation shall be subject to the provisions of BC2.5.1, which will apply as if set out in this BC2.9.7.2. No further submissions of **BM Unit Data** or **Generating Unit Data** (other than data specified in BC1.4.2(c) (**Export and Import Limits**) and BC1.4.2(e) (**Dynamic Parameters**)) should be attempted. Plant failure or similar problems causing significant deviation from **Physical Notification** should be notified to **The Company** by telephone by the submission of a revision to **Export and Import Limits** in relation to the **BM Unit** or **Generating Unit Data** so affected;
- (c) Revisions to **Export and Import Limits** and to **Dynamic Parameters** should be notified to **The Company** by telephone and will be recorded for subsequent use;
- (d) **The Company** will issue **Bid-Offer Acceptances** by telephone which will be recorded for subsequent use;
- (e) No data will be transferred from **The Company** to the **BMRA** until the communication facilities are re-established.

BC2.9.7.3 **The Company** will advise **BM Participants** of the withdrawal of **The Company** Computing System Failure notification following the re-establishment of the communication facilities.

- BC2.10 OTHER OPERATIONAL INSTRUCTIONS AND NOTIFICATIONS
- BC2.10.1 **The Company** may, from time to time, need to issue other instructions or notifications associated with the operation of the **National Electricity Transmission System**.
- BC2.10.2 Such instructions or notifications may include:
- Intertrips
- (a) an instruction to arm or disarm an **Operational Intertripping** scheme;
- Tap Positions
- (b) a request for a **Genset** step-up transformer tap position (for security assessment);
- Tests
- (c) an instruction to carry out tests as required under **OC5**, which may include the issue of an instruction regarding the operation of **CCGT Units** within a **CCGT Module** at a **Large Power Station**;
- Future BM Unit Requirements
- (d) a reference to any implications for future **BM Unit** requirements and the security of the **National Electricity Transmission System**, including arrangements for change in output to meet post fault security requirements;
- Changes to Target Frequency
- (e) a notification of a change in **Target Frequency**, which will normally only be 49.95, 50.00, or 50.05Hz but in exceptional circumstances as determined by **The Company** in its reasonable opinion, may be 49.90 or 50.10Hz.
- BC2.10.3 Where an instruction or notification under BC2.10.2 (c) or (d) results in a change to the input or output level of the **BM Unit** then **The Company** shall issue a **Bid-Offer Acceptance** or **Emergency Instruction** as appropriate.
- BC2.11 LIAISON WITH GENERATORS FOR RISK OF TRIP AND AVR TESTING
- BC2.11.1 A **Generator** at the **Control Point** for any of its **Large Power Stations** may request **The Company's** agreement for one of the **Gensets** at that **Power Station** to be operated under a risk of trip. **The Company's** agreement will be dependent on the risk to the **National Electricity Transmission System** that a trip of the **Genset** would constitute.
- BC2.11.2 (a) Each **Generator** at the **Control Point** for any of its **Large Power Stations** will operate its **Synchronised Gensets** (excluding **Power Park Modules**) with:
- (i) **AVRs** in constant terminal voltage mode with VAR limiters in service at all times. **AVR** constant **Reactive Power** or **Power Factor** mode should, if installed, be disabled; and
- (ii) its generator step-up transformer tap changer selected to manual mode, unless released from this obligation in respect of a particular **Genset** by **The Company**.
- (b) Each **Generator** at the **Control Point** for any of its **Large Power Stations** will operate its **Power Park Modules** with a **Completion Date** before 1st January 2006 at unity power factor at the **Grid Entry Point** (or **User System Entry Point** if **Embedded**).
- (c) Each **Generator** at the **Control Point** for any of its **Large Power Stations** will operate its **Power Park Modules** with a **Completion Date** on or after 1st January 2006 in voltage control mode at the **Grid Entry Point** (or **User System Entry Point** if **Embedded**). Constant **Reactive Power** or **Power Factor** mode should, if installed, be disabled.

- (d) Where a **Power System Stabiliser** is fitted as part of the excitation system or voltage control system of a **Genset**, it requires on-load commissioning which must be witnessed by **The Company**. Only when the performance of the **Power System Stabiliser** has been approved by **The Company** shall it be switched into service by a **Generator** and then it will be kept in service at all times unless otherwise agreed with **The Company**. Further reference is made to this in CC.6.3.8 and ECC.6.3.8.

BC2.11.3 A **Generator** at the **Control Point** for any of its **Power Stations** may request **The Company's** agreement for one of its **Gensets** at that **Power Station** to be operated with the **AVR** in manual mode, or **Power System Stabiliser** switched out, or **VAR** limiter switched out. **The Company's** agreement will be dependent on the risk that would be imposed on the **National Electricity Transmission System** and any **User System**. Provided that in any event a **Generator** may take such action as is reasonably necessary on safety grounds (relating to personnel or plant) .

BC2.11.4 Each **Generator** shall operate its dynamically controlled **OTSDUW Plant and Apparatus** to ensure that the reactive capability and voltage control performance requirements as specified in CC.6.3.2, CC.6.3.8, CC.A.7 or ECC.6.3.2, ECC.6.3.8, ECC.A.7, ECC.A.8 and the **Bilateral Agreement** can be satisfied in response to the Setpoint Voltage and Slope as instructed by **The Company** at the **Transmission Interface Point**.

BC2.12 LIAISON WITH EXTERNALLY INTERCONNECTED SYSTEM OPERATORS

BC2.12.1 Co-Ordination Role Of Externally Interconnected System Operators

- (a) The **Externally Interconnected System Operator** will act as the **Control Point** for **Bid-Off** **Acceptances** on behalf of **Interconnector Users** and will co-ordinate instructions relating to **Ancillary Services** and **Emergency Instructions** on behalf of **Interconnector Users** using its **External System** in respect of each **Interconnector Users BM Units**.
- (b) **The Company** will issue **Bid-Off** **Acceptances** and instructions for **Ancillary Services** relating to **Interconnector Users BM Units** to each **Externally Interconnected System Operator** in respect of each **Interconnector User** using its **External System**.
- (c) If, as a result of a reduction in the capability (in MW) of the **External Interconnection**, the total of the **Physical Notifications** and **Bid-Off** **Acceptances** issued for the relevant period using that **External Interconnection**, as stated in the **BM Unit Data** exceeds the reduced capability (in MW) of the respective **External Interconnection** in that period then **The Company** shall notify the **Externally Interconnected System Operator** accordingly. The **Externally Interconnected System Operator** should seek a revision of **Export and Import Limits** from one or more of its **Interconnector Users** for the remainder of the **Balancing Mechanism** period during which **Physical Notifications** cannot be revised.

BC2.13 LIAISON WITH INTERCONNECTOR OWNERS

- (a) Calculate the Interconnector Scheduled Transfer
 - i) **Interconnector Owners** shall use best endeavours to deliver an updated **Interconnector Scheduled Transfer** to **NGET** by 10 minutes after each **Intraday Cross-Zonal Gate Closure Time**.
 - ii) The updated **Interconnector Scheduled Transfer** shall fully reflect the results of the **Single Intraday Coupling**.
 - iii) **Interconnector Owners** must ensure that the updated **Interconnector Scheduled Transfer** is received in its entirety and logged into **NGET's** computer systems by the time of 10 minutes after each **Intraday Cross-zonal Gate Closure Time**.

APPENDIX 1 - FORM OF BID-OFFER ACCEPTANCES

- BC2.A.1.1 This Appendix describes the forms of **Bid-Offer Acceptances**. As described in BC2.6.1 **Bid-Offer Acceptances** are normally given by an automatic logging device, but in the event of failure of the logging device, **Bid-Offer Acceptances** will be given by telephone.
- BC2.A.1.2 For each **BM Unit** the **Bid-Offer Acceptance** will consist of a series of MW figures and associated times.
- BC2.A.1.3 The **Bid-Offer Acceptances** relating to **CCGT Modules** will assume that the **CCGT Units** within the **CCGT Module** will operate in accordance with the **CCGT Module Matrix**, as required by **BC1**. The **Bid-Offer Acceptances** relating to **Cascade Hydro Schemes** will assume that the **Generating Unit** forming part of the **Cascade Hydro Scheme** will operate, where submitted, in accordance with the **Cascade Hydro Scheme Matrix** submitted under **BC1**. The **Bid-Offer Acceptances** relating to **Synchronous Power Generating Modules** will assume that the **Synchronous Generating Units** within the **Synchronous Power Generating Module** will operate in accordance with the **Synchronous Power Generating Module Matrix**, as required by **BC1**.
- BC2.A.1.4 Bid-Offer Acceptances Given By Automatic Logging Device
- (a) The complete form of the **Bid-Offer Acceptance** is given in the EDL Message Interface Specification which can be made available to **Users** on request.
- (b) **Bid-Offer Acceptances** will normally follow the form:
- (i) **BM Unit Name**
 - (ii) Instruction Reference Number
 - (iii) Time of instruction
 - (iv) Type of instruction
 - (v) **BM Unit Bid-Offer Acceptance** number
 - (vi) Number of MW/Time points making up instruction (minimum 2, maximum 5)
 - (vii) MW value and Time value for each point identified in (vi)
- The times required in the instruction are input and displayed in London time, but communicated electronically in GMT.
- BC2.A.1.5 Bid-Offer Acceptances Given By Telephone
- (a) All run-up/run-down rates will be assumed to be constant and consistent with **Dynamic Parameters**. Each **Bid-Offer Acceptance** will, wherever possible, be kept simple, drawing as necessary from the following forms and BC2.7
- (b) **Bid-Offer Acceptances** given by telephone will normally follow the form:
- (i) an exchange of operator names;
 - (ii) **BM Unit Name**;
 - (iii) Time of instruction;
 - (iv) Type of instruction;
 - (v) Number of MW/Time points making up instruction (minimum 2, maximum 5)
 - (vi) MW value and Time value for each point identified in (v)
- The times required in the instruction are expressed in London time.

For example, for a **BM Unit** ABCD-1 acceptance logged with a start time at 1400 hours and with a FPN at 300MW:

"BM Unit ABCD-1 Bid-Offer Acceptance timed at 1400 hours. Acceptance consists of 4 MW/Time points as follows:

300MW at 1400 hours
400MW at 1415 hours
400MW at 1450 hours
300MW at 1500 hours"

BC2.A.1.6 Submission Of Bid-Offer Acceptance Data To The Bmra

The relevant information contained in **Bid-Offer Acceptances** issued by **The Company** will be converted into "from" and "to" MW levels and times before they are submitted to the **BMRA** by **The Company**.

APPENDIX 2 - TYPE AND FORM OF ANCILLARY SERVICE INSTRUCTIONS

BC2.A.2.1 This part of the Appendix consists of a non-exhaustive list of the forms and types of instruction for a **Genset** to provide **System Ancillary Services**. There may be other types of **Commercial Ancillary Services** and these will be covered in the relevant **Ancillary Services Agreement**. In respect of the provision of **Ancillary Services** by **Generating Units** the forms and types of instruction will be in the form of this Appendix 2 unless amended in the **Ancillary Services Agreement**.

As described in CC.8 and ECC.8, **System Ancillary Services** consist of Part 1 and Part 2 **System Ancillary Services**.

Part 1 System Ancillary Services Comprise:

- (a) **Reactive Power** supplied other than by means of synchronous or static compensators. This is required to ensure that a satisfactory **System** voltage profile is maintained and that sufficient **Reactive Power** reserves are maintained under normal and fault conditions. **Ancillary Service** instructions in relation to **Reactive Power** may include:
 - (i) MVar Output
 - (ii) Target Voltage Levels
 - (iii) Tap Changes
 - (iv) Maximum MVar Output ('maximum excitation')
 - (v) Maximum MVar Absorption ('minimum excitation')
- (b) **Frequency** Control by means of **Frequency** sensitive generation. **Gensets** may be required to move to or from **Frequency Sensitive Mode** in the combinations agreed in the relevant **Ancillary Services Agreement**. They will be specifically requested to operate so as to provide **Primary Response** and/or **Secondary Response** and/or **High Frequency Response**.

Part 2 System Ancillary Services Comprise:

- (c) **Frequency** Control by means of **Fast Start**.
- (d) **Black Start Capability**

~~(e)~~ A restoration service provided by Restoration Service Providers party to a Distribution Restoration Zone Plan Contract.

(f) System to Generator Operational Intertripping

BC2.A.2.2 As **Ancillary Service** instructions are not part of **Bid-Offer Acceptances** they do not need to be closed instructions and can cover any period of time, not just limited to the period of the **Balancing Mechanism**.

BC2.A.2.3 As described in BC2.6.1, unless otherwise agreed with **The Company**, **Ancillary Service** instructions are normally given by automatic logging device, but in the absence of, or in the event of failure of the logging device, instructions will be given by telephone.

BC2.A.2.4 Instructions Given By given by Automatic Logging Device

- (a) The complete form of the **Ancillary Service** instruction is given in the EDL Message Interface Specification which is available to **Users** on request from **The Company**.
- (b) **Ancillary Service** instructions for **Frequency** Control will normally follow the form:
 - (i) **BM Unit Name**
 - (ii) Instruction Reference Number
 - (iii) Time of instruction
 - (iv) Type of instruction (REAS)

(v) Reason Code

(vi) Start Time

(c) **Ancillary Service** instructions for **Reactive Power** will normally follow the form:

(i) **BM Unit Name**

(ii) Instruction Reference Number

(iii) Time of instruction

(iv) Type of instruction (MVar, VOLT or TAPP)

(v) Target Value

(vi) Target Time

The times required in the instruction are input and displayed in London time, but communicated electronically in GMT.

BC2.A.2.5

Instructions Given By Telephone

(a) **Ancillary Service** instructions for **Frequency Control** will normally follow the form:

(i) an exchange of operator names;

(ii) **BM Unit Name**;

(iii) Time of instruction;

(iv) Type of instruction;

(v) Start Time.

The times required in the instruction are expressed in London time.

For example, for **BM Unit ABCD-1** instructed at 1400 hours to provide **Primary** and **High Frequency** response starting at 1415 hours:

"BM Unit ABCD-1 message timed at 1400 hours. Unit to Primary and High Frequency Response at 1415 hours"

(b) **Ancillary Service** instructions for **Reactive Power** will normally follow the form:

(a) an exchange of operator names;

(b) **BM Unit Name**;

(c) Time of instruction;

(d) Type of instruction (MVar, VOLT, SETPOINT, **SLOPE** or TAPP)

(e) Target Value

(f) Target Time.

The times required in the instruction are expressed as London time.

For example, for **BM Unit ABCD-1** instructed at 1400 hours to provide 100MVar by 1415 hours:

"BM Unit ABCD-1 message timed at 1400 hours. MVar instruction. Unit to plus 100 MVar target time 1415 hours."

BC2.A.2.6 Reactive Power

As described in BC2.A.2.4 and BC2.A.2.5 instructions for **Ancillary Services** relating to **Reactive Power** may consist of any of several specific types of instruction. The following table describes these instructions in more detail:

Instruction Name	Description	Type of Instruction
MVAr Output	<p>The individual MVAr output from the Genset onto the National Electricity Transmission System at the Grid Entry Point (or onto the User System at the User System Entry Point in the case of Embedded Power Stations), namely on the higher voltage side of the generator step-up transformer or Grid Entry Point or User System Entry Point in the case of a Power Generating Module. In relation to each Genset, where there is no HV indication, The Company and the Generator will discuss and agree equivalent MVAr levels for the corresponding LV indication.</p> <p>Where a Genset is instructed to a specific MVAr output, the Generator must achieve that output within a tolerance of +/- 25 MVAr (for Gensets in England and Wales) or the lesser of +/-5% of rated output or 25MVAr (for Gensets in Scotland) (or such other figure as may be agreed with The Company) by tap changing on the generator step-up transformer, or adjusting the Genset terminal voltage, subject to compliance with CC.6.3.8 (a) (v), or ECC.6.3.8.3.3 (as applicable) to a value that is equal to or higher than 1.0p.u. of the rated terminal voltage, or a combination of both. Once this has been achieved, the Generator will not tap again and will not readjust the Genset terminal voltage without prior consultation with and the agreement of The Company, on the basis that MVAr output will be allowed to vary with System conditions.</p>	MVAr

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Instruction Name	Description	Type of Instruction
Target Voltage Levels	<p>Target voltage levels to be achieved by the Genset on the National Electricity Transmission System at the Grid Entry Point (or on the User System at the User System Entry Point in the case of Embedded Power Stations, namely on the higher voltage side of the generator step-up transformer or Grid Entry Point or User System Entry Point in the case of a Power Generating Module. Where a Genset is instructed to a specific target voltage, the Generator must achieve that target within a tolerance of ± 1 kV (or such other figure as may be agreed with The Company) by tap changing on the generator step-up transformer, or adjusting the Genset terminal voltage, subject to compliance with CC.6.3.8 (a) (v) or ECC.6.3.8.3.3 (as applicable), to a value that is equal to or higher than 1.0p.u. of the rated terminal voltage, or a combination of both. In relation to each Genset, where there is no HV indication, The Company and the Generator will discuss and agree equivalent voltage levels for the corresponding LV indication.</p> <p>Under normal operating conditions, once this target voltage level has been achieved the Generator will not tap again and will not readjust the Genset terminal voltage without prior consultation with, and with the agreement of, The Company.</p> <p>However, under certain circumstances the Generator may be instructed to maintain a target voltage until otherwise instructed and this will be achieved by tap changing on the generator step-up transformer, or adjusting the Genset terminal voltage, subject to compliance with CC.6.3.8 (a) (v) or ECC.6.3.8.3.3 (as applicable), to a value that is equal to or higher than 1.0p.u. of the rated terminal voltage, or a combination of both without reference to The Company.</p>	VOLT
Setpoint Voltage	<p>Where a Non-Synchronous Generating Unit, DC Converter or Power Park Module or HVDC Converter is instructed to a specific Setpoint Voltage, the Generator must achieve that Setpoint Voltage within a tolerance of $\pm 0.25\%$ (or such other figure as may be agreed with The Company).</p> <p>The Generator must maintain the specified Setpoint Voltage target until an alternative target is received from The Company.</p>	SETPOINT

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Instruction Name	Description	Type of Instruction
Slope	<p>Where a Non-Synchronous Generating Unit, DC Converter or Power Park Module or HVDC Converter is instructed to a specific Slope, the Generator must achieve that Slope within a tolerance of $\pm 0.5\%$ (or such other figure as may be agreed with The Company).</p> <p>The Generator must maintain the specified Slope target until an alternative target is received from The Company.</p> <p>The Generator will not be required to implement a new Slope setting in a time of less than 1 week from the time of the instruction.</p>	SLOPE
Tap Changes	<p>Details of the required generator step-up transformer tap changes in relation to a Genset. The instruction for tap changes may be a Simultaneous Tap Change instruction, whereby the tap change must be effected by the Generator in response to an instruction from The Company issued simultaneously to relevant Power Stations. The instruction, which is normally preceded by advance notice, must be effected as soon as possible, and in any event within one minute of receipt from The Company of the instruction.</p> <p>For a Simultaneous Tap Change, change Genset generator step-up transformer tap position by one [two] taps to raise or lower (as relevant) System voltage, to be executed at time of instruction.</p>	TAPP
Maximum MVar Output ("maximum excitation")	Under certain conditions, such as low System voltage, an instruction to maximum MVar output at instructed MW output ("maximum excitation") may be given, and a Generator should take appropriate actions to maximise MVar output unless constrained by plant operational limits or safety grounds (relating to personnel or plant).	
Maximum MVar Absorption ("minimum excitation")	Under certain conditions, such as high System voltage, an instruction to maximum MVar absorption at instructed MW output ("minimum excitation") may be given, and a Generator should take appropriate actions to maximise MVar absorption unless constrained by plant operational limits or safety grounds (relating to personnel or plant).	

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BC2.A.2.7 In addition, the following provisions will apply to **Reactive Power** instructions:

- In circumstances where **The Company** issues new instructions in relation to more than one **BM Unit** at the same **Power Station** at the same time, tapping will be carried out by the **Generator** one tap at a time either alternately between (or in sequential order, if more than two), or at the same time on, each **BM Unit**.
- Where the instructions require more than two taps per **BM Unit** and that means that the instructions cannot be achieved within 2 minutes of the instruction time (or such longer period at **The Company** may have instructed), the instructions must each be achieved with the minimum of delay after the expiry of that period.

- (c) It should be noted that should **System** conditions require, **The Company** may need to instruct maximum MVar output to be achieved as soon as possible, but (subject to the provisions of paragraph (BC2.A.2.7(b) above) in any event no later than 2 minutes after the instruction is issued.
- (d) An **Ancillary Service** instruction relating to **Reactive Power** may be given in respect of **CCGT Units** within a **CCGT Module** at a **Power Station** or **Generating Units** within a **Synchronous Power Generating Module** at a **Power Station** where running arrangements and/or **System** conditions require, in both cases where exceptional circumstances apply and connection arrangements permit.
- (e) In relation to MVar matters, MVar generation/output is an export onto the **System** and is referred to as "lagging MVar", and MVar absorption is an import from the **System** and is referred to as "leading MVar".
- (f) It should be noted that the excitation control system constant **Reactive Power** output control mode or constant **Power Factor** output control mode will always be disabled, unless agreed otherwise with **The Company**.

APPENDIX 3 - SUBMISSION OF REVISED MVAr CAPABILITY

BC2.A.3.1 For the purpose of submitting revised MVAr data the following terms shall apply:

Full Output	In the case of a Synchronous Generating Unit (as defined in the Glossary and Definitions ((which could be part of a Synchronous Power Generating Module) and not limited by BC2.2) is the MW output measured at the generator stator terminals representing the LV equivalent of the Registered Capacity at the Grid Entry Point , and in the case of a Non-Synchronous Generating Unit (excluding Power Park Units), HVDC Converter or DC Converter or Power Park Module is the Registered Capacity at the Grid Entry Point
Minimum Output	In the case of a Synchronous Generating Unit (as defined in the Glossary and Definitions ((which could be part of a Synchronous Power Generating Module) and not limited by BC2.2-) is the MW output measured at the generator stator terminals representing the LV equivalent of the Minimum Generation or Minimum Stable Operating Level at the Grid Entry Point , and in the case of a Non-Synchronous Generating Unit (excluding Power Park Units), HVDC Converter or DC Converter or Power Park Module is the Minimum Generation or Minimum Stable Operating Level or Minimum Active Power Transmission Capacity at the Grid Entry Point

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BC2.A.3.2 The following provisions apply to faxed submission of revised MVAr data:

- (a) The fax must be transmitted to **The Company** (to the relevant location in accordance with GC6) and must contain all the sections from the relevant part of Annexure 1 and from either Annexure 2 or 3 (as applicable) but with only the data changes set out. The "notification time" must be completed to refer to the time of transmission, where the time is expressed as London time.
- (b) Upon receipt of the fax, **The Company** will acknowledge receipt by sending a fax back to the **User**. The acknowledgement will either state that the fax has been received and is legible or will state that it (or part of it) is not legible and will request re-transmission of the whole (or part) of the fax.
- (c) Upon receipt of the acknowledging fax the **User** will, if requested, re-transmit the whole or the relevant part of the fax.
- (d) The provisions of paragraphs (b) and (c) then apply to that re-transmitted fax.

APPENDIX 3 - ANNEXURE 1



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Company name **REVISED REACTIVE POWER
CAPABILITY DATA**

TO: National Electricity Transmission
System Control Centre

Fax telephone No.

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Number of pages inc. header:.....

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Sent By :

Return Acknowledgement Fax to

For Retransmission or Clarification ring.....

Acknowledged by **The Company**: (Signature)

.....

Acknowledgement time and date

.....

Legibility of FAX :

Acceptable

--

Unacceptable

(List pages if appropriate)

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(Resend FAX)

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APPENDIX 3 - ANNEXURE 2

To: National Electricity Transmission System Control Centre

From : [Company Name & Location]

REVISED REACTIVE POWER CAPABILITY DATA – GENERATING UNITS EXCLUDING POWER PARK MODULES AND DC CONVERTERS

Notification Time (HH:MM):	Notification Date (DD/MM/YY):
Start Time (HH:MM):	Start Date (DD/MM/YY):
Generating Unit*	

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* For a **Synchronous Power Generating Module** and/or **CCGT Module** and/or a **Cascade Hydro Scheme**, the redeclaration is for a **Generating Unit** within a **Synchronous Power Generating Module** and/or **CCGT Module** and/or **Cascade Hydro Scheme**. For **BM Units** quote **The Company** BM Unit id, for other units quote the **Generating Unit** id used for OC2.4.1.2 Outage Planning submissions. **Generating Unit** has the meaning given in the Glossary and Definitions and is not limited by BC2.2.

REVISION TO THE REACTIVE POWER CAPABILITY AT THE GENERATING UNIT STATOR TERMINALS (at rated terminal volts) **AS STATED IN THE RELEVANT ANCILLARY SERVICES AGREEMENT:**

	MW	MINIMUM (MVA _r +ve for lag, -ve for lead)	MAXIMUM (MVA _r +ve for lag, -ve for lead)
AT RATED MW			
AT FULL OUTPUT (MW)			
AT MINIMUM OUTPUT (MW)			

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COMMENTS e.g. generator transformer tap restrictions, predicted end time if known

Redeclaration made by (Signature)

APPENDIX 3 - ANNEXURE 3

To: National Electricity Transmission System Control Centre

From : [Company Name & Location]

REVISED REACTIVE POWER CAPABILITY DATA – POWER PARK MODULES, HVDC CONVERTERS AND DC CONVERTERS

Notification Time (HH:MM):	Notification Date (DD/MM/YY):
Start Time (HH:MM):	Start Date (DD/MM/YY):
Power Park Module / DC Converter*	

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* For BM Units quote **The Company** BM Unit id, for other units quote the id used for OC2.4.1.2 Outage Planning submissions

Start Time/Date (if not effective immediately)

REVISION TO THE REACTIVE POWER CAPABILITY AT THE COMMERCIAL BOUNDARY AS STATED IN THE RELEVANT ANCILLARY SERVICES AGREEMENT:

	MINIMUM (MVar +ve for lag, -ve for lead)	MAXIMUM (MVar +ve for lag, -ve for lead)
AT RATED MW		
AT 50% OF RATED MW		
AT 20% OF RATED MW		
BELOW 20% OF RATED MW		
AT 0% OF RATED MW		

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COMMENTS e.g. generator transformer tap restrictions, predicted end time if known

Redeclaration made by (Signature)

APPENDIX 4 - SUBMISSION OF AVAILABILITY OF FREQUENCY SENSITIVE MODE

- BC2.A.4.1 For the purpose of submitting availability of **Frequency Sensitive Mode**, this process only relates to the provision of response under the **Frequency Sensitive Mode** and does not cover the provision of response under the **Limited Frequency Sensitive Mode**.
- BC2.A.4.2 The following provisions apply to the faxed submission of the **Frequency Sensitive Mode availability**;
- (a) The fax must be transmitted to **The Company** (to the relevant location in accordance with GC6) and must contain all the sections relevant to Appendix 4 - Annexure1 but with only the data changes set out. The "notification time" must be completed to refer to the time and date of transmission, where the time is expressed in London time.
 - (b) Upon receipt of the fax, **The Company** will acknowledge receipt by sending a fax back to the **User**. This acknowledging fax should be in the format of Appendix 4 – Annexure 1. The acknowledgement will either state that the fax has been received and is legible or will state that it (or part of it) is not legible and will request re-transmission of the whole (or part) of the fax.
 - (c) Upon receipt of the acknowledging fax the **User** will, if requested re-transmit the whole or the relevant part of the fax.
 - (d) The provisions of paragraph (b) and (c) then apply to the re-transmitted fax.
- BC2.A.4.3 The **User** shall ensure the availability of operating in the **Frequency Sensitive Mode** is restored as soon as reasonably practicable and will notify **The Company** using the format of Appendix 4 – Annexure 1. In the event of a sustained unavailability of **Frequency Sensitive Mode**, **The Company** may seek to confirm compliance with the relevant requirements in the **CC** or **ECC** through the process in **OC5** or **ECP**.

APPENDIX 4 - ANNEXURE 1

To: National Electricity Transmission System Control Centre

From : [Company Name & Location]

Submission of availability of Frequency Sensitive Mode

Notification Time (HH:MM):	Notification Date (DD/MM/YY):
Start Time (HH:MM):	Start Date (DD/MM/YY):
Genset or DC Converter	

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The availability of the above unit to operate in **Frequency Sensitive Mode** is as follows:

All contract modes: Available / Unavailable *[delete as applicable]; or*

Change to the availability of individual contract modes:

Contract Mode e.g. A	Availability for operation in Frequency Sensitive Mode [Y/N]

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COMMENTS e.g. reason for submission, predicted end time if known

Redeclaration made by (Signature) _____

Receipt Acknowledgement from **The Company**

Legible (tick box)		Illegible (tick box)	
Explanation:			
Time:			
Date:			
Signature:			

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SCHEDULE 5 Users System Data

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Table 5 (h)

DISTRIBUTION RESTORATION INFORMATION		
The following data/text items are required from Network Operators as detailed in PC.A.5.8 in relation to a as part of a Distribution Restoration Zone Plan . The data should be provided in accordance with PC.A.1.2 and also, where possible, upon request from The Company during a Black Start .		
Data Description	Units	Data Category
(PC.A.5.8) (■ CUSC Contract)		
Assuming all Restoration Service Provider's Plant and Apparatus were running immediately prior to the Total Shutdown or Partial Shutdown and in the event of loss of all external power supplies, provide the following information:		
a) Expected time for the first and subsequent Restoration Service Provider's Plant and/or Apparatus to be Synchronised , following a Total Shutdown or Partial Shutdown .	Tabular or Graphical	DPD II
b) Describe any likely any specific issues (eg those that would affect the time before which the Anchor Plant and Restoration Service Provider's Plant could be Synchronised) that may arise as time progresses from Shutdown without external supplies being restored. issues that would have a significant impact on the Anchor Generator's and/or Anchor HVDC System Owner's and/or Anchor DC Converter owner's and Restoration Service Provider's ability to resynchronise all their Plant, if all were running immediately prior to the Total Shutdown or Partial Shutdown. Additionally, this should highlight any specific issues (ie those that would affect the time before which which the Anchor Plant and Restoration Service Provider's Plant to be Synchronised) that may arise, as time progresses without external supplies being restored.	Text	
Block Loading Capability:		
ea) Provide estimated Block Loading Capability . This should be provided in either graphical or tabular format showing the estimated Block Loading Capability from OMW to Registered Capacity or Maximum Capacity as the case may be. Any particular Active Power loading points at which the Anchor Plant or Restoration Service Provider's Plant should be operated until further changes in output can be accommodated hold' points should also be identified. The data of each Anchor Plant and Restoration Service Provider's Plant forming part of a Distribution Restoration Zone should be provided for the condition of an Anchor Plant or Restoration Service Provider's Plant (which is considered as both a 'hot' unit (operating immediately prior to, and at the point of,	Tabular or Graphical	DPD II

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Commented [VG101]: Just to confirm will Scottish Network Operators be asked to provide this to The Company (and then this will be provided to the Scottish TOs) or to the Relevant Scottish Transmission Licensee directly? AJ Response - Yes

Commented [AMC102]: Is this text required? A RSP in a DRZ wouldn't necessarily be a CUSC party AJ Response- The DNO is required to obtain this data and submit to the ESO.

Commented [AMC103]: This isn't what PC.A.5.8 requires AJ Response – It is covered under PC.A.5.8(a)

Consistency

Commented [AMC104]: Ditto AJ response – As above

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Commented [AMC105]: consistency with PC.A.5.8 – AJ Response – This is covered in PC.A.5.8(b)

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Commented [AMC107]: delete – see comment in PC.A.5.8 AJ Rresponse – Not sure about this – see comment in PC.A.5.8

<p>Shutdown run prior to Shutdown and cold unit (not run operated for 48 hours or more prior to the Shutdown) that was Synchronised just prior to the Total Shutdown or Partial Shutdown. In the case of an Anchor HVDC System or Anchor DC Converter, data should be provided when the Anchor HVDC System or Anchor DC Converter has been considered to have run immediately before prior to the Total Shutdown or Partial Shutdown and equally when the HVDC System or DC Converter has been considered to have been Shutdown for a period of 48 hours or more.</p>		
<p>The block loading assessment should be done against a frequency variation of 49.5Hz – 50.5Hz.</p>		

Commented [AMC108]: Consistency with PC.A.5.8 – AJ Response - Point Noted – we will pick this up when we revise OC9 as part of the ESRS – the changes have already been made to PC.A.5.8 which can be introduced into the DRC.

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SCHEDULE 14 - FAULT INFEED DATA (GENERATORS INCLUDING UNIT TRANSFORMERS AND STATION TRANSFORMERS)

PAGE 1 OF 5

The data in this Schedule 14 is all **Standard Planning Data**, and is to be provided by **Generators**, with respect to all directly connected **Power Stations**, all **Embedded Large Power Stations** and all **Embedded Medium Power Stations** connected to the **Subtransmission System**. A data submission is to be made each year in Week 24.

Fault infeeds via Unit Transformers

A submission should be made for each **Generating Unit** (including those which are part of a **Synchronous Power Generating Module**) with an associated **Unit Transformer**. Where there is more than one **Unit Transformer** associated with a **Generating Unit**, a value for the total infeed through all **Unit Transformers** should be provided. The infeed through the **Unit Transformer(s)** should include contributions from all motors normally connected to the **Unit Board**, together with any generation (e.g. **Auxiliary Gas TurbinesEnergy Supplies**) which would normally be connected to the **Unit Board**, and should be expressed as a fault current at the **Generating Unit** terminals for a fault at that location.

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SCHEDULE 14 - FAULT INFEED DATA (GENERATORS INCLUDING UNIT TRANSFORMERS AND STATION TRANSFORMERS)

PAGE 2 OF 5

Fault infeeds via Station Transformers

A submission is required for each **Station Transformer** directly connected to the **National Electricity Transmission System**. The submission should represent normal operating conditions when the maximum number of **Gensets** are **Synchronised** to the **System**, and should include the fault current from all motors normally connected to the **Station Board**, together with any Generation (e.g. **Auxiliary Gas TurbinesEnergy Supplies**) which would normally be connected to the **Station Board**. The fault infeed should be expressed as a fault current at the hv terminals of the **Station Transformer** for a fault at that location.

SCHEDULE 19 – USER DATA FILE STRUCTURE
PAGE 1 OF 2

The structure of the **User Data File Structure** is given below.

i.d.	Folder name	Description of contents
Part A: Commercial & Legal		
A2	Commissioning	Commissioning & Test Programmes
A3	Statements	Statements of Readiness
A9	AS Monitoring	Ancillary Services Monitoring
A10	Self Certification	User Self Certification of Compliance
A11	Compliance statements	Compliance Statement
Part 1: Safety & System Operation		
1.1	Interface Agreements	Interface Agreements
1.2	Safety Rules	Safety Rules
1.3	Switching Procedures	Local Switching Procedures
1.4	Earthing	Earthing
1.5	SRS	Site Responsibility Schedules
1.6	Diagrams	Operational and Gas Zone Diagrams
1.7	Drawings	Site Common Drawings
1.8	Telephony	Control Telephony
1.9	Safety Procedures	Local Safety Procedures
1.10	Co-ordinators	Safety Co-ordinators
1.11	RISSP	Record of Inter System Safety Precautions
1.12	Tel Numbers	Telephone Numbers for Joint System Incidents
1.13	Contact Details	Contact Details (fax, tel, email)
1.14	Restoration Plan	Local Joint Restoration Plan <u>and Distribution Restoration Zone Plan</u> (incl. black start if applicable)
1.15	Maintenance	Maintenance Standards
Part 2: Connection Technical Data		
2.1	DRC Schedule 5	DRC Schedule 5 – Users System Data
2.2	Protection Report	Protection Settings Reports
2.3	Special Automatic Facilities	Special Automatic Facilities e.g. intertrip
2.4	Operational Metering	Operational Metering
2.5	Tariff Metering	Tariff Metering
2.6	Operational Comms	Operational Communications
2.7	Monitoring	Performance Monitoring
2.8	Power Quality	Power Quality Test Results (if required)

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SCHEDULE 19 – USER DATA FILE STRUCTURE
PAGE 2 OF 2

Part 3: Generator Technical Data		
3.1	DRC Schedule 1	DRC Schedule 1 - Generating Unit, Power Generating Module, HVDC System and DC Converter Technical Data
3.2	DRC Schedule 2	DRC Schedule 2 - Generation Planning Data
3.3	DRC Schedule 4	DRC Schedule 4 – Frequency Droop & Response
3.4	DRC Schedule 14	DRC Schedule 14 – Fault Infeed Data – Generators
3.5	Special Generator Protection	Special Generator Protection eg Pole slipping; islanding
3.6	Compliance Tests	Compliance Tests & Evidence
3.7	Compliance Studies	Compliance Simulation Studies
3.8	Site Specific	Bilateral Connections Agreement Technical Data & Compliance
Part 4: General DRC Schedules		
4.1	DRC Schedule 3	DRC Schedule 3 – Large Power Station Outage Information
4.2	DRC Schedule 6	DRC Schedule 6 – Users Outage Information
4.3	DRC Schedule 7	DRC Schedule 7 – Load Characteristics
4.4	DRC Schedule 8	DRC Schedule 8 – BM Unit Data (if applicable)
4.5	DRC Schedule 10	DRC Schedule 10 –Demand Profiles
4.6	DRC Schedule 11	DRC Schedule 11 – Connection Point Data
Part 5: OTSDUW Data And Information (if applicable and prior to OTSUA Transfer Time)		
		Diagrams Circuits Plant and Apparatus Circuit Parameters Protection Operation and Autoswitching Automatic Control Systems
		Mathematical model of dynamic compensation plant

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< END OF DATA REGISTRATION CODE >

Extracts from General Conditions

- GC.A.1.11 The following matters potentially require amendments to the **GB Grid Code**:
- (a) The specific detail of the obligations needed to manage implementation in the period up to and following (for a temporary period) **Go-Live** to achieve the change to operation under the **GB Grid Code** (to be included in GC.A.3).
 - (b) Information (including data) and other requirements under the **GB Grid Code** applicable to **Scottish Users** during the **Transition Period** (to be included in GC.A.2).
 - (c) The conclusions of Ofgem/DTI in relation to small and/or embedded generator issues under BETTA and allocation of access rights on a GB basis.
 - (d) Any arrangements required to make provision for operational liaison, including **Black Start** and islanding arrangements in Scotland.

- (e) Any arrangements required to make provision for cascade hydro **BM Units**.
- (f) Any consequential changes to the safety co-ordination arrangements resulting from **STC** and **STC** procedure development.
- (g) Any arrangements required to reflect the **Electrical Standards** for the **Transmission Systems** of **SPT** and **SHETL**.
- (h) The conclusions of Ofgem/DTI in relation to planning and operating standards.

GC.A.1.12 **The Company** shall notify the **Authority** of any amendments that **The Company** identifies as needed pursuant to GC.A.1.10 and shall make such amendments as the **Authority** approves.

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