Grid Code Workgroup Consultation Response Proforma

GC0125 'EU Code Emergency & Restoration: Black Start testing requirements for Interconnectors, HVDC System Owners and Owners of Transmission DC Converters'

Industry parties are invited to respond to this consultation expressing their views and supplying the rationale for those views, particularly in respect of any specific questions detailed below.

Please send your responses by **12 July 2019** to christine.brown1@nationalgrideso.com Please note that any responses received after the deadline or sent to a different email address may not receive due consideration by the Workgroup.

Any queries on the content of the consultation should be addressed to Chrissie Brown at christine.brown1@nationalgrideso.com

These responses will be considered by the Workgroup at their next meeting at which members will also consider any Workgroup Consultation Alternative Requests. Where appropriate, the Workgroup will record your response and its consideration of it within the final Workgroup Report which is submitted to the Grid Code Review Panel.

Respondent:	*Scottish Power Energy Networks*
Company Name:	*Please insert Company Name*
Please express your views regarding the Workgroup Consultation, including rationale. (Please include any issues, suggestions or queries)	*(a) To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity* *(b) Facilitating effective competition in the generation and supply of electricity (and without limiting the foregoing, to facilitate the national electricity transmission system being made available to persons authorised to supply or generate electricity on terms which neither prevent nor restrict competition in the supply or generation of electricity);* *(c) Subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution systems in the national electricity transmission system operator area taken as a whole;* *(d) To efficiently discharge the obligations imposed upon the licensee by this license and to comply with the Electricity Regulation and any relevant legally binding decisions of the European Commission and/or the Agency; and* *(e) To promote efficiency in the implementation and administration of the Grid Code arrangements*

Standard Workgroup consultation questions

Q	Question	Response
1	**Do you believe that GC0125 Original proposal, better facilitates the Grid Code Objectives?**	Yes subject to achieving clarification on the comments noted below.
2	**Do you support the proposed implementation approach?**	Yes
3	**Do you have any other comments?**	What is the meaning of 'HVDC achieving a stable operating point at an agreed capacity as agreed with the Company'? Is this related to capability to operate at a specific transfer, if yes, how can this be tested?
4	**Do you wish to raise a Workgroup Consultation Alternative Request for the Workgroup to consider?**	No

Specific questions for GC0125

Q	Question	Response
5	**Do you believe the Black Start testing requirements set out in the draft legal text at OC5.7.1(a) – (e) accurately reflects the testing requirements and adequately distinguishes the obligations between Black Start Power Stations and Black Start HVDC Systems acknowledging that there are differences between them on the basis of their technology. Please provide your rationale bearing in mind a power station could be made up of a number of Black Start Generating Units whereas as Black Start HVDC System would apply to each HVDC System.**	-

Q	Question	Response
6	**Do you have any comments on the proposed legal text in Annex 4 of the consultation?**	Yes- the requirements specified in OC5.7.2.3 and OC5.7.2.5 seem to be at odds with each other. Under 5.7.2.3 (c) the test is deemed passed if the HVDC System or DC Converter Station is able to energise the busbar of the isolated AC-substation, however, under OC5.7.5 there is an expectation that in order to pass a Black Start Test (of which the Black Start HVDC Test specified in OC5.7.2.3 is one) that you need to synchronise with the system. Also ECC.6.3.5.4 also suggests there is an expectation the "HVDC System shall synchronise" within defined frequency and voltage limits. Clarification on whether synchronisation is required as part of a Black Start HVDC test is required and amendments made to the relevant clauses/definitions to recognise this.

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Any queries on the content of the consultation should be addressed to Chrissie Brown at christine.brown1@nationalgrideso.com

These responses will be considered by the Workgroup at their next meeting at which members will also consider any Workgroup Consultation Alternative Requests. Where appropriate, the Workgroup will record your response and its consideration of it within the final Workgroup Report which is submitted to the Grid Code Review Panel.

Respondent:	*Garth Graham (garth.graham@sse.com)*
Company Name:	*SSE Generation Ltd.,*
Please express your views regarding the Workgroup Consultation, including rationale. (Please include any issues, suggestions or queries)	*(a) To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity* *(b) Facilitating effective competition in the generation and supply of electricity (and without limiting the foregoing, to facilitate the national electricity transmission system being made available to persons authorised to supply or generate electricity on terms which neither prevent nor restrict competition in the supply or generation of electricity);* *(c) Subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution systems in the national electricity transmission system operator area taken as a whole;* *(d) To efficiently discharge the obligations imposed upon the licensee by this license and to comply with the Electricity Regulation and any relevant legally binding decisions of the European Commission and/or the Agency; and* *(e) To promote efficiency in the implementation and administration of the Grid Code arrangements*

Standard Workgroup consultation questions

Q	Question	Response
1	**Do you believe that GC0125 Original proposal, better facilitates the Grid Code Objectives?**	In our view GC0125 fails to better achieve Applicable Objective (d) as it fails to fully implement all the legal requirements set out in ERNC.
2	**Do you support the proposed implementation approach?**	The proposed implementation approach is not clear – is it ten Working Days after an Authority decision (like similar Grid Code Modifications) or some other date? Given this we cannot at this stage support an unknown implementation approach.
3	**Do you have any other comments?**	Noting the discussion on page 13 of the consultation, we are concerned that NGESO appears to want to contract for Black Start and other related Restoration services in a way that does not apply the Article 4(2)(b) terms and conditions for Restoration Service Providers that is required by the ERNC. We remind NGESO that they need to fully comply with the requirements within ERNC that apply to them (noting, for example, that to date they have failed to meet some of those requirements by the deadlines set out within ERNC).
4	**Do you wish to raise a Workgroup Consultation Alternative Request for the Workgroup to consider?**	No.

Specific questions for GC0125

Q	Question	Response
5	**Do you believe the Black Start testing requirements set out in the draft legal text at OC5.7.1(a) – (e) accurately reflects the testing requirements and adequately distinguishes the obligations between Black Start Power Stations and Black Start HVDC Systems acknowledging that there are differences between them on the basis of their technology. Please provide your rationale bearing in mind a power station could be made up of a number of Black Start Generating Units whereas as Black Start HVDC System would apply to each HVDC System.**	It is not clear to us how interconnectors will be involved in the Local Joint Restoration Plans. We are concerned that contracted Black Start interconnector providers maybe treated differently to Black Start Generation providers in terms of the services, such as block loading, they are required within the LJRPs to achieve which could be detrimental to the restoration of electricity supplies in GB in the event of a Black Start event.
6	**Do you have any comments on the proposed legal text in Annex 4 of the consultation?**	For the reasons we note under Q3 above, the legal text for 'Black Start Contract' is deficient as it fails to reflect the legal requirement that the TSO is unable to contract for Restoration service provision except via the terms and conditions required by Article 4(2)(b) of ERNC approved by the NRA. We are concerned that it the TSO contracts for Restoration services on terms and conditions that are not those set out in accordance with Article 4(2)(b) of ERNC that those contracts will be (i) incompatible with the legal requirements of ERNC and (ii) therefore will be detrimental to the restoration of electricity supplies in GB in the event of a Black Start event.

Grid Code Workgroup Consultation Response Proforma

GC0125 'EU Code Emergency & Restoration: Black Start testing requirements for Interconnectors, HVDC System Owners and Owners of Transmission DC Converters'

Industry parties are invited to respond to this consultation expressing their views and supplying the rationale for those views, particularly in respect of any specific questions detailed below.

Please send your responses by **12 July 2019** to christine.brown1@nationalgrideso.com Please note that any responses received after the deadline or sent to a different email address may not receive due consideration by the Workgroup.

Any queries on the content of the consultation should be addressed to Chrissie Brown at christine.brown1@nationalgrideso.com

These responses will be considered by the Workgroup at their next meeting at which members will also consider any Workgroup Consultation Alternative Requests. Where appropriate, the Workgroup will record your response and its consideration of it within the final Workgroup Report which is submitted to the Grid Code Review Panel.

Respondent:	Alastair Frew
Company Name:	Drax Generation Enterprise Ltd
Please express your views regarding the Workgroup Consultation, including rationale. (Please include any issues, suggestions or queries)	*(a) To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity* *(b) Facilitating effective competition in the generation and supply of electricity (and without limiting the foregoing, to facilitate the national electricity transmission system being made available to persons authorised to supply or generate electricity on terms which neither prevent nor restrict competition in the supply or generation of electricity);* *(c) Subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution systems in the national electricity transmission system operator area taken as a whole;* *(d) To efficiently discharge the obligations imposed upon the licensee by this license and to comply with the Electricity Regulation and any relevant legally binding decisions of the European Commission and/or the Agency; and* *(e) To promote efficiency in the implementation and administration of the Grid Code arrangements*

Standard Workgroup consultation questions

Q	Question	Response
1	**Do you believe that GC0125 Original proposal, better facilitates the Grid Code Objectives?**	Yes
2	**Do you support the proposed implementation approach?**	Yes, as this now implements changes to allow HVDC systems to be providers of Black Start services and going forward makes it easier in future for other parties to provide such services with minimum code changes.
3	**Do you have any other comments?**	No
4	**Do you wish to raise a Workgroup Consultation Alternative Request for the Workgroup to consider?**	No

Specific questions for GC0125

Q	Question	Response
5	**Do you believe the Black Start testing requirements set out in the draft legal text at OC5.7.1(a) – (e) accurately reflects the testing requirements and adequately distinguishes the obligations between Black Start Power Stations and Black Start HVDC Systems acknowledging that there are differences between them on the basis of their technology. Please provide your rationale bearing in mind a power station could be made up of a number of Black Start Generating Units whereas as Black Start HVDC System would apply to each HVDC System.**	Yes as Generators and HVDC are both required to carry out 3 yearly tests.

6	**Do you have any comments on the proposed legal text in Annex 4 of the consultation?**	Definition **Block Loading Capability** the word **"**generator" has been change from an undefined term meaning equipment to a defined term "**Generator"** mean a party whilst all the rest of the text refers equipment and not a party. Should **Generator** be replaced with **Genset**? In the **Black Start HVDC Systems** definition there are 3 types of system listed namely **HVDC System** or **DC Converter Station** or **Transmission DC Converter** but there are only 2 types of owner listed namely **HVDC System Owner** or **DC Converter Station Owner,** is this correct? Also whilst there are 3 types of system in the definition only 2 are listed everywhere else throughout the document, again is this correct? Definition **Start-Up** typo in the first sentence "bringing". "ECC.6.3.5.4 Each **HVDC System** or **Remote End HVDC Converter Station"** this is a different term from those used previously is it correct? OC5.7.1(a)(i) suggested improvement "In the case of a **Generator**, **The Company** may shall require a **Generator** with a **Black Start Station** to carry out a test (~~a~~ either "**Black Start Unit Test**" or a "**Black Start Station Test**") on a **Genset** in a **Black Start Station** ~~(a ""**Black Start Unit Test**"") (a ""**Black Start Station Test**"")~~, in order to demonstrate that a **Black Start Station** has a **Black Start Capability**." OC5.7.1(d) suggest this section is removed and OC5.7.1(d)(i) is moved into a new section OC.7.1(b)(iii) and changed as follows "(iii) In the case of the **Generator** with a **Black Start Station**, **The Company** may 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 two calendar years in respect of any particular **Genset** unless it can justify on reasonable grounds the necessity for further tests or unless the further test is a re-test). If successful this **Black Start Station Test** shall count as a successful **Black Start Unit Test** for the **Genset** used in the test.". Section OC5.7.1(d)(ii) is as far as I can see basically the same as OC5.7.1(b)(ii) so it does not need replicated. OC9.4.7.2 wording does not flow as written possibly change "**Genset**, **HVDC System**, **DC Converter Station"** to **"User's** equipment". OC9.4.7.4(c) there is a mix of party's and equipment at one point possible solution as follows "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 ~~**Generator**~~ **Gensets** or **HVDC Systems** or **DC Converter Station**." . Equally changing "**Generator** or **HVDC Systems** or **DC Converter Station"** to "**Users**" might be better.

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Any queries on the content of the consultation should be addressed to Chrissie Brown at christine.brown1@nationalgrideso.com

These responses will be considered by the Workgroup at their next meeting at which members will also consider any Workgroup Consultation Alternative Requests. Where appropriate, the Workgroup will record your response and its consideration of it within the final Workgroup Report which is submitted to the Grid Code Review Panel.

Respondent:	*Alan Creighton*
Company Name:	*Northern Powergrid*
Please express your views regarding the Workgroup Consultation, including rationale. (Please include any issues, suggestions or queries)	*(a) To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity* *(b) Facilitating effective competition in the generation and supply of electricity (and without limiting the foregoing, to facilitate the national electricity transmission system being made available to persons authorised to supply or generate electricity on terms which neither prevent nor restrict competition in the supply or generation of electricity);* *(c) Subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution systems in the national electricity transmission system operator area taken as a whole;* *(d) To efficiently discharge the obligations imposed upon the licensee by this license and to comply with the Electricity Regulation and any relevant legally binding decisions of the European Commission and/or the Agency; and* *(e) To promote efficiency in the implementation and administration of the Grid Code arrangements*

Standard Workgroup consultation questions

Q	Question	Response
1	**Do you believe that GC0125 Original proposal, better facilitates the Grid Code Objectives?**	Yes, the proposal provides a level playing field for parties providing black start services
2	**Do you support the proposed implementation approach?**	Yes
3	**Do you have any other comments?**	No, other than in response to Question 6
4	**Do you wish to raise a Workgroup Consultation Alternative Request for the Workgroup to consider?**	No

Specific questions for GC0125

Q	Question	Response
5	**Do you believe the Black Start testing requirements set out in the draft legal text at OC5.7.1(a) – (e) accurately reflects the testing requirements and adequately distinguishes the obligations between Black Start Power Stations and Black Start HVDC Systems acknowledging that there are differences between them on the basis of their technology. Please provide your rationale bearing in mind a power station could be made up of a number of Black Start Generating Units whereas as Black Start HVDC System would apply to each HVDC System.**	Yes, subject to the comments in response to question 6
6	**Do you have any comments on the proposed legal text in Annex 4 of the consultation?**	Yes, please see the comments on the legal text which are embedded in the attached copy of the Consultation document and form part of this consultation response

GLOSSARY & DEFINITIONS

(GD)

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

Black Start	The procedure necessary for a recovery from a **Total Shutdown** or **Partial Shutdown**.
Black Start Capability	In the case of ~~Either a~~An ability ~~in respect 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 **System** and be **Synchronised** to the **System** upon instruction from **The Company**, within two hours, without an external electrical power supply. In the case of a **Black Start HVDC System** is the ability of an ~~to~~ **HVDC System** to **Start-Up** from **Shutdown** and to energise a part of the **System** and be **Synchronised** to the **System** upon instruction from **The Company**, within two hours, without an external electrical power supply from the **GB Synchronous Area**.
Black Start Contract	An agreement between a **Black Start Service Provider** ~~**Generator** or an **HVDC System Owner**~~ and **The Company** under which the **Black Start Service Provider** ~~**Generator** or an **HVDC System Owner**~~ provides a **Black Start Capability** and other associated services~~, in accordance with the terms and conditions to act as **Restoration Service Providers** on a contractual basis approved by the Authority in accordance with Article 4 (2) (b) and (4),.or as amended in accordance with Article 4(7), of **European Regulation (EU) 2017/2196.**~~.
Block Loading Capability	The incremental **Active Power** steps, from no load to **Rated MW**, which a **Generator** or **HVDC System** or **DC Converter Station** can instantaneously supply without causing it to trip or go outside the **Frequency** range of 47.5Hz – 52Hz ~~(or an otherwise agreed **Frequency** range of 47.5 – 52Hz~~ (or an otherwise agreed **Frequency** range). The time between each incremental step shall also be provided.
Defence Service Provider	A **User** with a legal or contractual obligation to provide a service contributing to one or several measures of the **System Defence Plan**.
European Regulation (EU) 2017/2196	**Commission Regulation (EU) 2017/2196** of 24 November 2017 establishing a network code on emergency and restoration
Restoration Service Provider	A **Black Start Service Provider** or **User** with a legal or contractual obligation to provide a service contributing to one or several measures of the **System Restoration Plan**.
Black Start HVDC System	An **HVDC System** or **DC Converter Station** or **Transmission DC Converter** 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**.
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 Test	A **Black Start Test** carried out by a **Black Start Service Provider**~~a Generator with a Black Start Station,~~ 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 ~~It can be~~ a **Black Start Station Test**, ~~or~~ a **Black Start Unit Test** or **Black Start HVDC Test**.
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**.~~alternating current electrical supplies.~~
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 an external alternating current electrical supply.
Local Joint Restoration Plan	A plan produced under OC9.4.7.12 detailing the agreed method and procedure by which a **Black Start Service Provider** ~~**Genset** at a **Black Start Station** (possibly with other **Gensets** at that **Black Start Station**) or **Black Start HVDC System**~~ will energise part of the **Total System** and meet complementary blocks of local **Demand** so as to form a **Power Island**. In Scotland, the plan may also: cover more than one **Black Start** ~~**Station Service Provider**~~; includinge ~~**Gensets** other than those at a **Black Start Station** and cover the creation of one or more **Power Islands**.~~
Partial Shutdown	The same as a **Total Shutdown** except that all generation has ceased in a separate part of the **Total System** and there is no electricity supply from **External Interconnections** or other parts of the **Total System** to that part of the **Total System** and, therefore, that part of the **Total System** is shutdown, with the result that it is not possible for that part of the **Total System** to begin to function again without **The Company's** directions relating to a **Black Start**.
Shutdown	In the case of a **Generating Unit** is the condition of a **Generating Unit** where the generator rotor is at rest or on barring. In the case of an **HVDC System** or **DC Converter Station** or **Transmission DC Converter**, is the condition of an **HVDC System** or **DC Converter Station** or **Transmission DC Converter** where the **HVDC System** or **DC Converter Station** or **Transmission DC Converter** is de-energised and therefore not importing or exporting **Apparent Power** to or from the **Total System**.
Start-Up	In the case of a **Generating Unit** is the action of brining a **Generating Unit** from **Shutdown** to **Synchronous Speed**. In the case of an **HVDC System** or **DC Converter Station** or **Transmission DC Converter**, is the action of bringing the **HVDC System** or **DC Converter Station** from **Shutdown** to a state where it is energised.
System Defence Plan	A document prepared by **The Company**, as published on its **Website**, outlining how the requirements of the "defence plan" (as provided for **European Regulation (EU) 2017/2196**) has been implemented within the **GB Synchronous Area**.
System Restoration Plan	A document prepared by **The Company**, as published on its **Website**, outlining how the requirements of the "restoration plan" (as defined in **European Regulation (EU) 2017/2196**) has been implemented within the **GB Synchronous Area**.

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

Extract from PC

PC.A.5.7 Black Start Related Information

Data identified under this section PC.A.5.7 must be submitted as required under PC.A.1.2. This information may also be requested by **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 each **Generator**, **HVDC System Owner** and **DC Converter Station Owner** to **The Company**. In the case of **Generators**, the data supplied should be with respect to each **BM Unit** at a **Large Power Station** ~~**Station** (excluding the **Generating Units** (including **Synchronous Generating Units** within a **Synchronous Power Generating Module**) that are contracted to provide **Black Start Capability**, **Power Park Modules** (including **DC Connected Power Park Modules**) or **Generating Units** with an **Intermittent Power Source**)~~. 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 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' points should also be identified. The data of each **BM Unit** should be provided for the condition a **Generating Unit** (which is considered as both ~~of~~ a 'hot' unit and cold unit) that was **Synchronised** just prior to the **Total Shutdown** or **Partial Shutdown** ~~and also for the condition of a 'cold' unit~~. 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 run immediately 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.

Extract from CC

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

Extract from ECC

ECC.6.3.5 BLACK START

ECC.6.3.5.1 **Black Start** is not a mandatory requirement, however **EU Code Users** 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**. 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.

ECC.6.3.5.2 It is an essential requirement that the **National Electricity Transmission System** must incorporate a **Black Start Capability**. This will be achieved by agreeing a **Black Start Capability** at a number of strategically located **Power Stations** 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.

ECC.6.3.5.3 Where an **EU Code User** has entered into a **Black Start Contract** to provide a **Black Start 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.

(b) ~~(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 **The Company** in the **Black Start 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 an ~~unenergised~~un~~-~~energis~~z~~ed **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:

be capable of **Block Load Capability**,

be capable of operating in **LFSM-O** and **LFSM-U**, as specified in ECC.6.3.7.1 and ECC.6.3.7.2

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 be capable of parallel operation of a few **Power Generating Modules** including **DC Connected Power Park Modules** within an isolated part of the **Total System** that is still supplying **Customers**, and control voltage automatically during the system restoration phase;

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~~an~~ other **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**:

(b) ~~(i)~~ **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:

the **Frequency** limits for island operation shall be those specified in ECC.6.1.2,

the voltage limits for island operation shall be those defined in ECC.6.1.4;

(ii) **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**;

(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;

(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;

ECC.6.3.5.6 With regard to quick re-synchronisation capability:

(b) ~~(i)~~ 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.

Extract from OC5

OC5.7 BLACK START TESTING

OC5.7.1 General

(a) **The Company** shall~~may~~ 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** ~~may~~ shall require a **Generator** with a **Black Start Station** to carry out a test (a ~~"~~"**Black Start Test**~~"~~") on a **Genset** in a **Black Start Station** ~~either while the **Black Start Station** remains connected to an external alternating current electrical supply~~ (a ~~"~~"**Black Start Unit Test**~~"~~") or ~~while the **Black Start Station** is disconnected from all external alternating current electrical supplies~~ (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~~may~~ 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**.

~~(a) **The Company** may require a **Generator** with a **Black Start Station** to carry out a test (a ~~"~~"**Black Start Test**~~"~~") on a **Genset** in a **Black Start Station** either while the **Black Start Station** remains connected to an external alternating current electrical supply (a ~~"~~"**BS Unit Test**~~"~~") or while the **Black Start Station** is disconnected from all external alternating current electrical supplies (a ~~"~~"**BS Station Test**~~"~~"), in order to demonstrate that a **Black Start Station** has a **Black Start Capability**.~~

(b) Where **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 ~~to demonstrate~~ execute such a~~-~~ test at least once every three years. **The Company** shall not require the **Black Start Test Unit** to be carried out on more than one **Genset** at that **Black Start Station** at the same time, and would not, in the absence of exceptional circumstances, expect any of the other **Genset**s at the **Black Start Station** to be directly affected by the **Black Start Unit Test**.

(ii) Where **The Company** requires a **Black Start HVDC System Owner** or **DC Converter Station Owner** to carry out a **Black Start HVDC Test**, the **Black Start HVDC System Owner** or **DC Converter Station Owner** shall execute a **Black Start HVDC Test** at least once every three years.

The~~e~~~~is~~ above tests will be deemed a success where starting from **S~~s~~hutdown** is achieved within a time frame specified by **The Company** and which may be agreed in ~~any relevant contact.~~the **Black Start Contract**.

c) **The Company** may require a **Generator** to carry out ~~with~~ a **Black Start Unit Test Station** ~~to carry out a **BS 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) Occassionally, **The Company,** may require **a Black Start Service Provider** ~~**Generator** with a **Black Start Station**~~ **to** carry out a **Black Start** ~~**Station**~~ **Test** at any time.

(i) In the case of the **Generator** with a **Black Start Station**, **The Company** may 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 two calendar years in respect of any particular **Genset** unless it can justify on reasonable grounds the necessity for further tests or unless the further test is a re-test). If successful this **Black Start Station Test** shall count as a successful **Black Start Unit Test** for the **Genset** used in the test.

(ii) In the case of an **HVDC System Owner** or **DC Converteer Station Owner** with a **Black Start HVDC System**, **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 two calendar years unless it can justify on reasonable grounds the necessity for further tests or unless the further test is a re-test).

(e) When **The Company** wishes a ~~**Generator**~~ **Black Start Service Provider** ~~with a **Black Start Station**~~ to carry out a **Black Start Test**, it shall notify the relevant ~~**Generator**~~ **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**.

OC5.7.2 Procedure f~~F~~or a~~A~~ Black Start Test

The following procedure will, so far as practicable, be carried out in the following sequence for **Black Start Tests**:

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** in the **Black Start Station** in which that **Generating Unit** is situated, shall be **Shutdown**.

(c) The **Generating Unit** shall be **De-Loaded** and **De-Synchronised** and all alternating current electrical supplies to its **Auxiliaries** shall be disconnected.

(d) The **Auxiliary Gas Turbine(s)** or **Auxiliary Diesel Engine(s)** to the relevant **Generating Unit** shall be started, and shall re-energise the **Unit Board** of the relevant **Generating Unit**.

(e) The **Auxiliaries** of the relevant **Generating Unit** shall be fed by the **Auxiliary Gas Turbine(s)** or **Auxiliary Diesel Engine(s)**, via the **Unit Board**, to enable the relevant **Generating Unit** to return to **Synchronous Speed**.

(f) The relevant **Generating Unit** shall be **Synchronised** to the **System** but not **Loaded**, unless the appropriate instruction has been given by **The Company** under **BC2**.

(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.

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** at the **Black Start Station**, shall be **Shutdown**.

(b) The relevant **Generating Unit** shall be **Synchronised** and **Loaded**.

(c) The relevant **Generating Unit** shall be **De-Loaded** and **De-Synchronised**.

(d) All external alternating current electrical supplies to the **Unit Board** of the relevant **Generating Unit**, and to the **Station Board** of the relevant **Black Start Station**, shall be disconnected.

(e) An **Auxiliary Gas Turbine** or **Auxiliary Diesel Engine** at the **Black Start Station** shall be started, and shall re-energise either directly, or via the **Station Board**, the **Unit Board** of the relevant **Generating Unit**.

(f) The provisions of 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 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 ~~**HVDC System** **Shutd** **Down**~~;

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**;

~~i)~~ The **HVDC System** or **DC Converter Station** can achieve a stable operating point at an agreed capacity as agreed with **The Company**

OC5.7.2.4~~3~~ All **Black Start Tests** shall be carried out at the time specified by **The Company** in the notice given under OC5.7.1~~(fd)~~ 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~~4~~ 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)** being required to start).

OC5.7.2.6~~5~~ If a **Black Start Station** or **Black Start HVDC System** fails to pass a **Black Start Test** the **Black Start Service Provider**~~**Generator**~~ 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 ~~**Generator**~~ **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 Provider**~~**Generator**~~ shall seek to resolve the dispute by discussion, and if they fail to reach agreement, the **Black Start Service Provider**~~**Generator**~~**r** 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 as the case may be, as if **The Company** had issued an instruction at the time of notice from the **Black Start Service Provider**~~**Generator**~~.

OC5.7.2.7~~6~~ 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.

OC5.7.2.87 If following the procedure in OC5.7.2.65 and OC5.7.2.76 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**~~**Generator**~~ shall submit to **The Company** in writing for approval, the date and time by which that **Black Start Service Provider**~~**Generator**~~ 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**~~**Generator's**~~ proposed date and time submitted. Should **The Company** not approve the **Black Start Service Provider's**~~**Generator's**~~ proposed date and time (or any revised proposal) the **Black Start Service Provider**~~**Generator**~~ shall revise such proposal having regard to any comments **The Company** may have made and resubmit it for approval.

OC5.7.2.98 Once the **Black Start Service Provider**~~**Generator**~~ has indicated to **The Company** that the **Generating 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**~~**Generator**~~ 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) following the same procedure as for the initial **Black Start Test**. The provisions of this OC5.7.2 will apply to such test.

Extracts from OC9

OC9.4.5 Black Start Service Providers~~Stations~~

OC9.4.5.1 ~~Certain **Power Stations** ("**Black Start Stations**") and **HVDC Systems** ("**Black Start HVDC Systems**")are registered, pursuant to the **Bilateral Agreement** with a **User**, as~~ **Black Start Service Providers** are registered pursuant to the **Bilateral Agreement** as having the ~~an~~ capability ~~for at least one of its **Gensets**~~ to **Start-Up** from **Shutdown** and to energise a part of the **Total System**, or be **Synchronised** to the **System**, upon instruction from **The Company** within two hours, without an external electrical power supply ("**Black Start Capability**").

OC9.4.5.2 ~~-~~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**~~**Generator**~~ and **Network Operator** in accordance with the provisions of OC9.4.7.12. The **Local Joint Restoration Plan** will detail the agreed method and procedure by which a **Genset** at a **Black Start Station** (possibly with other **Gensets** at that **Black Start Station**) and **Black Start HVDC Systems** will energise part of the **Total System** and meet complementary local **Demand** so as to form a **Power Island**.

OC9.4.5.3 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**~~.~~.

OC9.4.6 **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**.

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 OC9.4.7.9.

The **Black Start** will conclude with effect from the time and date determined in accordance with OC9.4.7.10.

In respect of **Scottish Transmission Systems**, in exceptional circumstances, as specified in the **Local Joint Restoration Plan**, **SPT** or **SHETL**, may invoke such **Local Joint Restoration Plan** for its own **Transmission System** and **Scottish Offshore Transmission Systems** connected to it and operate within its provisions.

OC9.4.7 Black Start

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

OC9.4.7.2 The complexities and uncertainties of recovery from a **Total Shutdown** or **Partial Shutdown** require that **OC9** is sufficiently flexible in order to accommodate the full range of **Genset**, **HVDC System**, **DC Converter Station** and **Total System** characteristics and operational possibilities, and this precludes the setting out in the **Grid Code** itself of concise chronological sequences. The overall strategy will, in general, include the overlapping phases of establishment of **Genset(s)**, at an isolated **Power Station**, or **HVDC System** or **DC Converter Stations**, 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**. **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 **Black Start Station** or **Black Start HVDC System** relating to the commencement of generation, to a **Network Operator** or **Non-Embedded Customer** relating to the restoration of **Demand**, and to a **Power Station** or **HVDC System** or **DC Converter Station** relating to preparation for commencement of generation when an external power supply is made available to it, and in each case may include the requirement to undertake switching.

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

OC9.4.7.4 (a) **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** and ~~**Power Stations** and to **Network Operators**~~ 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 ~~**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**.

(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**, **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 **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**.

(c) 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**~~**Generator**~~ 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 **Generator** or **HVDC Systems** 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**~~**Generator**~~ concerned alone and accepts that the **Black Start Service Provider**~~**Generator**~~ may change ~~generation~~ 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**~~**Generator**~~ 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**.

Local Joint Restoration Plan operation

OC9.4.7.6 (a) The following provisions apply in relation to a **Local Joint Restoration Plan**. As set out in OC9.4.7.3, **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, not withstanding that **The Company** has stated that it wishes the remainder of the **Local Joint Restoration Plan** to apply, the **Black Start Service Provider**~~**Generator**~~ 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**~~**Black Start Station**~~ 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**~~**Generator**~~ that the **Black Start Station** or **Black Start HVDC System** is ready to accept load, **The Company** will instruct the **Black Start Service Provider**~~**Black Start Station**~~ to energise part of the **Total System**. The **Black Start Service Provider**~~**Black Start Station**~~ and the relevant **Network Operator** will then, in accordance with the requirements of the **Local Joint Restoration Plan**, establish communication and agree the output of the relevant **Genset(s)** a~~-~~nd/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**~~**Generator**~~ will be required to regulate the output of the relevant ~~**Genset(s)** at its~~ **Black Start Station** or **Black S~~s~~tart 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) 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**

(g) In Scotland, **Gensets** or **HVDC Systems** or **DC Converter Station** 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

OC9.4.7.7 **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 an **Embedded Black Start Station** which has established a **Power Island** within its **User System** or with any **Embedded Power Stations** within its **User System** which have become islanded, may in liaison with **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 will inform **The Company** of their actions and will not **Re-Synchronise** to the **National Electricity Transmission System** or any **User's System** which is already **Synchronised** to the **National Electricity Transmission System** without **The Company 's** agreement.

Return the Total System Back to Normal Operation

OC9.4.7.9 **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 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

OC9.4.7.10 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

OC9.4.7.11 During a **Black Start**, **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.

OC9.4.7.12 Local Joint Restoration Plan Establishment

(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**~~**Generator**~~ will discuss and agree a **Local Joint Restoration Plan**. Where at the date of the first inclusion of this OC9.4.7.12 into the **Grid Code** a local plan covering the procedures to be covered in a **Local Joint Restoration Plan** is in

existence and agreed, **The Company** will discuss this with **NGET**, the **Network Operator** ~~and~~ and the relevant **Generator** or, **HVDC System Owner** or~~and~~ **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(b) shall apply. If it is not agreed to be so consistent, then the provisions of OC9.4.7.12(b) shall apply as if there is no **Local Joint Restoration Plan** in place.

In respect of **Scottish Transmission Systems** where a requirement for a **Local Joint Restoration Plan** is identified, **The Company**, the **Relevant Scottish Transmission Licensee(s)**, the **Network Operator** and **Black Start Service Provider's**~~**Black Start Station(s)**~~ will discuss and agree a **Local Joint Restoration Plan**. In addition other **Users**, including other **Generators** or **HVDC Systems** ~~**Owners**~~ or **DC Converter Station Owners**, may be reasonably required by **The Company** to discuss and agree a **Local Joint Restoration Plan**.

(b) In England and Wales, where the need for a **Local Joint Restoration Plan** arises when there is none in place, the following provisions shall apply:

(i) **The Company**, **NGET**, the **Network Operator** and the relevant **Black Start Service Provider**~~**Generator**~~ will discuss and agree the detail of the **Local Joint Restoration Plan** as soon as the requirement for a **Local Joint Restoration Plan** is identified by **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 Compan**y, **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, 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 shall apply to such discussions and to any consequent changes.

(xii) **The Company**, **NGET**, the **Network Operator**, ~~and~~ and the relevant **Generator**, or ~~the relevant~~ **HVDC System Owner** ~~and the relevant~~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 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 8 years.

(c) In respect of **Scottish Transmission Systems**, where the need for a **Local Joint Restoration Plan** arises, the following provisions shall apply:

(i) **The Company**, the **Relevant Scottish Transmission Licensee(s)**, the **Network Operator** and the relevant **Black Start Service Provider**~~**Generator**~~ will discuss and agree the detail of the **Local Joint Restoration Plan** as soon as the requirement for a **Local Joint Restoration Plan** is identified by **The Company**. In addition, other **Scottish Users**, including other **Generators**, ~~**and**~~ **HVDC System**~~**s**~~ **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.

(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** ~~or other **HVDC Systems** than a **Black Start HVDC System**~~. 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, 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 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**~~**Generator**~~ will conduct regular joint exercises of the **Local Joint Restoration Plan** to which they are parties. The objectives of such exercises include:

• To test the effectiveness of the **Local Joint Restoration Plan**;

• To provide for joint training of the parties in respect of the **Local Joint Restoration Plan**;

• To maintain the parties' awareness and familiarity of the **Local Joint Restoration Plan**;

• To promote understanding of each parties' roles under a **Local Joint Restoration Plan**;

• To identify any improvement areas which should be incorporated in to the **Local Joint Restoration Plan**.

• The principles applying to the establishment of a new **Local Joint Restoration Plan** under this OC9.4.7.12 shall apply to any changes to the **Local Joint Restoration Plan**.

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 8 years.

Extract from BC2

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**'.

In Scotland, any instruction in relation to **Gensets** or **HVDC Systems** or **DC Converter Station** that are not at **Black Start Stations** or at **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**'.

Extract from DRC schedule 16

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SCHEDULE 16 - BLACK START INFORMATION

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PART I

BLACK START INFORMATION The following data/text items are required from each **Generator** for each **BM Unit** at a **Large Power Station** as detailed in PC.A.5.7. Data is not required for **Generating Units** that are contracted to provide **Black Start Capability**, **Power Generating Modules Power Park Modules** or **Generating Units** that have an **Intermittent Power Source**. The data should be provided in accordance with PC.A.1.2 and also, where possible, upon request from **The Company** during a **Black Start**.	Data Category	Units	Data Description *(PC.A.5.7) (■ CUSC Contract)*
			Assuming all **BM Units** 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:
	DPD II	Tabular or Graphical	a) Expected time for the first and subsequent **BM Units** to be **Synchronised**, from the restoration of external power supplies, assuming external power supplies are not available for up to 24hrs
	DPD II	Text	b) Describe any likely issues that would have a significant impact on a **BM Unit's** time to be **Synchronised** arising as a direct consequence of the inherent design or operational practice of the **Power Station** and/or **BM Unit**, e.g. limited barring facilities, time from a **Total Shutdown** or **Partial Shutdown** at which batteries would be discharged.
			Block Loading Capability:
	DPD II	Tabular or Graphical	c) Provide estimated **Block Loading Capability** from 0MW to **Registered Capacity** of each **BM Unit** based on the unit being 'hot' (run prior to shutdown) and also 'cold' (not run for 48hrs or more prior to the shutdown). The **Block Loading Capability** should be valid for a frequency deviation of 49.5Hz – 50.5Hz. The data should identify any required 'hold' points.

SCHEDULE 16 - BLACK START INFORMATION

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PART II

BLACK START INFORMATION The following data/text items are required from each **HVDC System Owner** **DC Converter Station Owner** for each **HVDC System** and **DC Converter Station** as detailed in PC.A.5.7. Data is not required for **HVDC Systems** and **DC Converter Stations** that are contracted to provide a **Black Start Capability**. 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 Category	Units	Data Description *(PC.A.5.7) (■ CUSC Contract)*
			Assuming all **BM Units** 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:
	DPD II	Tabular or Graphical	a) Expected time for the first and subsequent **BM Units** to be **Synchronised**, from the restoration of external power supplies, assuming external power supplies are not available for up to 24hrs
	DPD II	Text	b) Describe any likely issues that would have a significant impact on a **BM Units** time to be **Synchronised** arising as a direct consequence of the inherent design or operational practice of the **HVDC System** or **DC Converter Station** and/or **BM Unit**, e.g. time from a **Total Shutdown** or **Partial Shutdown** at which batteries would be discharged.
			Block Loading Capability:
	DPD II	Tabular or Graphical	c) Provide estimated incremental **Active Power** steps, form no load to **Rated MW** which an **HVDC System** or **DC Converter Station** can instantaneously supply without causing it to trip or go outside the **Frequency** range of 47.5Hz – 52Hz (or an otherwise agreed **Frequency** range). The time between each incremental step shall also be provided. In addition data should be provided from 0MW to **Registered Capacity** of each **BM Unit** based on the **HVDC System** or **DC Converter Station** being (not run for 48hrs or more prior to the shutdown) or run immediately before the **Partial Shutdown** or **Total Shutdown**. The data supplied should be valid for a **Frequency** deviation of 49.5Hz – 50.5Hz and should identify any required 'hold' points.

