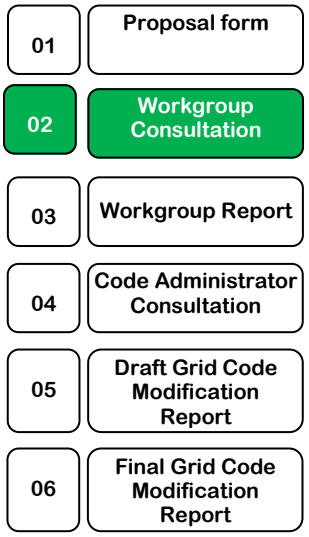
Workgroup Consultation	At what stage is this document in the process?

GC0127 & GC0128:

Mod Title: EU Code Emergency & Restoration: Requirements resulting from System Defence and Restoration Plans



Purpose of Modification: This modification seeks to align the GB Grid Code with the European Emergency and Restoration code, specifically in relation to requirements on Grid Code parties set out in the System Defence Plan and System Restoration Plan that need to be implemented by 18 December 2019.

This document contains the discussion of the Workgroup which formed in May 2019 to develop and assess the proposal. Any interested party is able to make a response in line with the guidance set out in the Governance Rules of the Grid Code.

Published on: 19 July 2019

Length of Consultation: 20 Working days

Responses by: 16 August 2019

High Impact:

GC0127: Electricity System Operator (ESO), Transmission Owners, Generators who have signed a CUSC Contract, HVDC System Owners who have signed a CUSC Contract, DC Converter Station Owners who have signed a CUSC Contract, Network Operators, Non-Embedded Customers and BM Participants (who are also Aggregators and Demand Response Providers)

GC0128: Electricity System Operator (ESO), Transmission Owners, Generators who have signed a CUSC Contract, HVDC System Owners who have signed a CUSC Contract, DC Converter Station Owners who have signed a CUSC Contract, Network Operators, Non-Embedded Customers, Providers of Black Start Services and BM Parties (who are also Aggregators and Demand Response Providers)

Contents

Timetable

The Code Administrator recommends the following timetable:	
Presented to Panel	25 April 2019
Initial consideration by Workgroup	May 2019
Workgroup Report presented to Panel	September 2019
Code Administration Consultation Report issued to the Industry	September 2019
Draft Final Modification Report presented to Panel	26 September 2019
Modification Panel decision	26 September 2019
Final Modification Report issued to the Authority	11 October 2019
Expected Authority Decision	29 November 2019
Decision implemented in Grid Code	17 December 2019

Any questions?

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1 About this document

This Workgroup Consultation contains the discussion of the Workgroup which formed in May 2019 to develop and assess the proposals. This Consultation document covers both modification GC0127 and GC0128.

Section 2 (Original Proposal) and **Section 3 (Proposer's solution**) are sourced directly from the Proposer and any statements or assertions have not been altered or substantiated/supported or refuted by the Workgroup. Section 5 of the Workgroup contains the discussion by the Workgroup on the Proposal and the potential solution.

The Grid Code Panel detailed in the Terms of Reference the scope of work for the GC0127 and GC0128 Workgroup and the specific areas that the Workgroup should consider.

The table below details these specific areas and where the Workgroup have covered them or will cover them post Workgroup Consultation.

The full Terms of Reference can be found in Annex 1.

Terms of Reference GC0127

Specific Area	Location in the report
Implementation and costs;	Section 2, 3 and 5
Review draft legal text should it have been provided. If legal text is not submitted within the Grid Code Modification Proposal the Workgroup should be instructed to assist in the developing of the legal text;	Annex 4
Consider whether any further Industry experts or stakeholders should be invited to participate within the Workgroup to ensure that all potentially affected stakeholders have the opportunity to be represented in the Workgroup. Demonstrate what has been done to cover this clearly in the report;	Section 5
Confirm when GC0127 requirements would apply to Users	Section 2, 3 & 5
Are there any cross-code impacts?	Section 2, 3 & 5
Consider the impacts on Grid Code Users • whether all types of storage are affected or those classified as SGU's • the load disconnection, frequencies and profiles being used	Section 2, 3 & 5

• how to maintain the commercial services that are currently provided • Seek a view from the NGESO in regards to the impact on system inertia	
Consider how balancing services will be obtained from Users that do not currently provide them	Section 2, 3 & 5

Terms of Reference GC0128

Specific Area	Location in the report
Implementation and costs;	Section 2, 3 & 5
Review draft legal text should it have been provided. If legal text is not submitted within the Grid Code Modification Proposal the Workgroup should be instructed to assist in the developing of the legal text;	Annex 4
Consider whether any further Industry experts or stakeholders should be invited to participate within the Workgroup to ensure that all potentially affected stakeholders have the opportunity to be represented in the Workgroup. Demonstrate what has been done to cover this clearly in the report;	Section 5
Confirm when GC0128 requirements would apply to Users	Section 2, 3 & 5
Are there any cross-code impacts?	Section 2, 3 & 5
Consider the impacts on Grid Code Users	Section 2, 3 & 5
Consider the impact of embedded generation as part of a black start restoration plan	Section 2, 3 & 5
who can be a frequency leader, and under what circumstances	Section 2, 3 & 5

Acronym Table

Acronym	Meaning
E&R NC	Emergency and Restoration Network Code[1]
DCC	Demand Connection Code
HVDC	High Voltage Direct Current
NGESO	National Grid Electricity System Operator
SRP	System Restoration Plan
SDP	System Defence Plan
SGU	Significant Grid User
RfG	Requirements for Generators European Code
SOGL	Electricity Transmission System Operation Guideline 2017/1485
BM	Balancing Mechanism

2 Original Proposal

Section 2 (Original Proposal) and Section 3 (Proposer's solution) are sourced directly from the Proposer and any statements or assertions have not been altered or substantiated/supported or refuted by the Workgroup. Section 5 of the

[1] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R2196&from=EN

Workgroup Consultation contains the discussion by the Workgroup on the Proposal and the potential solution.

Defect

The Emergency and Restoration Code (E&R) requires the Electricity System Operator to create a System Defence Plan (SDP) and System Restoration Plan (SRP), which National Grid ESO produced and consulted on in September 2018. There are also requirements on energy storage units and SGUs in the SDP and SGU's in the SRP that are not currently in the Grid Code, and so the two need to be aligned for transparency.

The SDP and SRP need to be implemented by 18 December 2019 so these modifications will need to be in the Grid Code by the same date.

What

This modification proposes to align E&R, the SDP, the SRP and the Grid Code.

Why

This modification needs to progress to ensure the sections of the SDP and SRP that need to be implemented by 18 December 2019 meet those timescales.

These Proposals are two of a number of Proposals which seek to implement relevant provisions of a number of new EU Network Codes/Guidelines which have been introduced in order to enable progress towards a competitive and efficient internal market in electricity. The full set of EU network guidelines and codes are;

- Regulation 2015/1222- Capacity Allocation and Congestion Management (CACM) which entered into force 14 August 2015;
- Regulation 2016/1719 – Forward Capacity Allocation (FCA) which entered into force 17 October 2016;
- Regulation 2016/631- Requirements for Generators (RfG) which entered into force 17 May 2016;
- Regulation 2016/1388 – Demand Connection Code (DCC) which entered into force 7 September 2016;
- Regulation 2016/1447 – High Voltage Direct Current (HVDC) which entered into force 28 September 2016;
- Transmission System Operation Guideline (SOGL) - which entered into force 14 September 2017; and
- Regulation 2017/2196 - Emergency and Restoration (E&R) which entered into force 18 December 2017.

The Regulation establishing a Network Code on Emergency and Restoration entered into force on 18 December 2017. The Emergency and Restoration Network Code sets out rules relating to the management of the electricity transmission system in the emergency, blackout and restoration states. The main objective of the relevant rules is to bring the system back to the normal state as quickly and efficiently as possible.

How – GC0127

In coordination with Article 15(3) of E&R and section 3.1.5 of the SDP specifies that:

Energy Storage systems taking energy are required to automatically switch to generating mode or where it is not capable of doing this must automatically disconnect before the activation of Low Frequency Demand Disconnection Scheme.

In coordination with Article 21(1b) of E&R, specifies that:

1. In case of absence of control area adequacy in the day-ahead or intraday timeframe, identified pursuant to paragraphs 1 and 2 of Article 107 of Regulation (EU) 2017/1485, and prior to any potential suspension of market activities pursuant to Article 35, a TSO shall be entitled to request assistance for active power from:

(a) any balancing service provider, which, upon the TSO request, shall change its availability status to make available all its active power, provided it was not already activated through the balancing market, and conforming to its technical constraints;

(b) any SGU connected in its LFC area, which does not already provide a balancing service to the TSO, and which, upon the TSO request, shall make available all its active power, conforming to its technical constraints; and

(c) other TSOs that are in the normal or alert state.

This requirement was also reflected in section 4.6.3 of the updated SDP.

How – GC0128

- Frequency management within a Black Start (Articles 27(4))

Frequency management within a Black Start (Articles 27(4))

Article 27 – Activation of the Re-energisation Procedure

Changes to clarify the requirements on ~~Distribution~~ System Operators (Transmission Owners and Distribution Network Operators) to provide demand, expected duration and risk information during a restoration. It is believed that the Grid Code already covers a number of these requirements although minor updates and points of clarification have been added to the legal text where necessary.

Governance

The Proposer recommended that this modification progresses to a Workgroup to fully understand the consequences of these changes for SGUs and storage providers and to ensure that the technical solution is developed to allow minimum disruption for these parties. The Panel agreed with this recommendation.

Technical Skillsets

Appreciation of the SDP, SRP and E&R.

Reference Documents

Emergency and Restoration Code:

Emergency and Restoration consultation documents (including the System Defence Plan and System Restoration Plan):

Please note that these documents are currently being consulted on by National Grid ESO and can be located at the following link;

https://www.nationalgrideso.com/codes/european-network-codes/meetings/emergency-and-restoration-consultation-open

3 Proposers Solution

Section 2 (Original Proposal) and Section 3 (Proposer's solution) are sourced directly from the Proposer and any statements or assertions have not been altered or substantiated/supported or refuted by the Workgroup. Section 5 of the Workgroup Consultation contains the discussion by the Workgroup on the Proposal and the potential solution.

GC0127

System Emergency State

E&R NC Article 13(2)(a)

In addition to the automatically activated schemes of the System Defence Plan, pursuant to point (a) of Article 11(5), each TSO shall activate a procedure of the System Defence Plan when the System is in Emergency State in accordance with the criteria set out in Article 18(3) or Regulation (EU) 2017/1485 and there are no remedial actions available to restore the system to the normal state".

It was noted that as part of System Operator Guideline (SOGL) that this requirement had not been included within Grid Code Working Groups GC0095, GC0106 and GC0114. As such section 2.1.1 of the System Defence Plan[2] has been updated to reflect this requirement.

Clause 2.1.1 of the System Defence Plan states that:

2.1.1 Procedures in this System Defence Plan will be activated when the System is in Emergency state, as defined in SOGL Article 18(3), or operational security analysis requires the activation of a measure. In summary this would occur when:-

- *The reserve capacity in the GB Synchronous Area is reduced by more than 20% for longer than 30 minutes and there is no mechanism to recover the deficit in reserve capacity; or*
- *A situation when Unacceptable Frequency Conditions as defined under the National Electricity Transmission System Security and Quality of Supply Standard have occurred; or*
- *At least one secured event as defined in the SQSS leads to a violation of the security limits even with remedial actions.*

[2] The version as issued for consultation by NGESO on 10th July 2019 at:

https://www.nationalgrideso.com/codes/european-network-codes/meetings/emergency-and-restoration-consultation-open

Storage providers

E&R NC Article 15(3) states that:

Prior to the activation of the automatic low frequency demand disconnection scheme, each TSO and DSO identified pursuant to Article 11(4) shall foresee that energy storage units acting as load connected to its system:

(a) automatically switch to generation mode within the time limit and at an active power set-point established by the TSO in the system defence plan; or

(b) when the energy storage unit is not capable of switching within the time limit established by the TSO in the system defence plan, automatically disconnect the energy storage unit acting as load.

This issue was discussed at the Workgroup and SDP clause 3.1.5 has now been updated to reflect these discussions.

Under the requirements that are proposed to be introduced through GC0096 (Storage), where Electricity Storage Modules would be treated as being owned by Generators (i.e. a Storage would be treated as a subset of Generation) then in respect of Electricity Storage Modules which are charging, they are required to automatically disconnect in accordance with the requirements of OC6 of the Grid Code before the activation of the Low Frequency Demand Disconnection Scheme. Article 15(3) and Article 15(4) of E&R NC places requirements on energy storage units acting as a load to automatically switch to generation mode during periods of low System Frequency. This action would need to take place between 49.5Hz (the threshold associated with LFSM-U) and 48.8Hz (the threshold associated with the first stage of LFDD). NGESO does not consider the action of automatic switching storage units from load to generation appropriate until further study work has been completed, due to the risk of any unintended consequences, the variable droop rates and the differences in performance between storage technologies. Under the proposed System Defence Plan, NGESO define the cycle time from import to export to be set to a very low value (eg 1µs) so the default option will be for the storage plant to trip under low frequency. The settings will be specified on a case by case basis through the Bilateral Agreement and would be within the range of 49.5Hz – 48.8Hz. This approach would be consistent with that suggested for Storage under the GC0096 proposals, the proposals of the (EU) Grid Connection Stakeholder Committee's Storage Expert Group and the approach adopted for Pumped Storage.

The Proposer does however note two observations. Firstly, the Connection Network Codes (RfG, HVDC and DCC) explicitly exclude storage. Secondly, as a separate GB Modification (outside of the EU Codes) a Workgroup has been established to investigate how the Storage technologies should be treated under the auspices of the GB Grid Code. This modification (GC0096) is nearing its conclusion and expected to be approved into the Grid Code at some time over the Summer/Autumn of 2019. In preparation of the additional text, many of the terms developed as part of the GC0096 proposal have been used as part of this modification. As there is significant overlap between the GC0127 proposals and GC0096 proposals, and noting that GC0096 is still

to be approved, the legal text that is relevant to the GC0127 modification (which has been taken from the GC0096 proposals) has been highlighted in blue text.

It is however important to note that E&R NC defines requirements for storage plant to be capable of switching from an importing mode to an exporting mode during periods of low frequency. This issue has not been addressed as part of the GC0096 Workgroup, although as part of this GC0127 modification initial consideration was given to this approach. The initial view of the Proposer was that a capability could be proposed as shown in Figure 1.0 below, however this was soon discounted on the basis of the variation in storage technologies, variable droop rates and unintended system consequences, whilst also noting that similar requirements do not apply to Pumped Storage or HVDC technologies. In addition, a separate (EU) Grid Connection Stakeholder Committee Expert Group was established in the autumn of 2018 to consider how the EU Connection Network Codes could be updated to consider the requirements for Storage. The requirements of Article 15(3) of (EU) Grid Connection Stakeholder Committee which relate to Storage were discussed as part of this Expert Group (https://docstore.entsoe.eu/Documents/Network%20codes%20documents/GC%20ESC/STORAGE/TOP_4_Report_from_EG_STORAGE.pdf) and the same conclusion was reached.

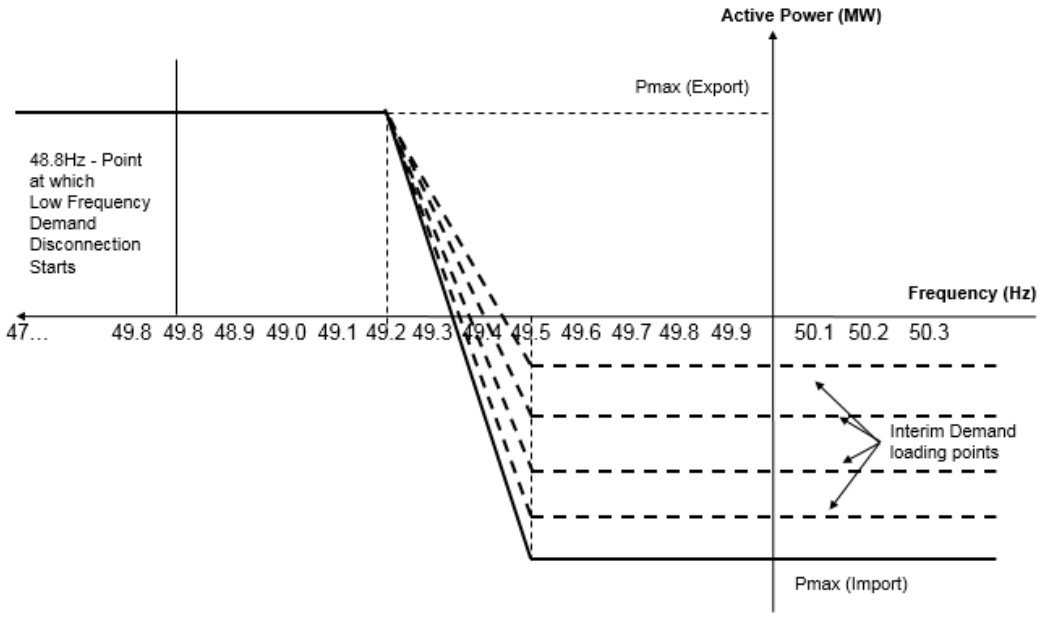

Figure 1.0

As noted above, Article 15(3) E&R NC does state that the TSO shall set the time limit and active power set point for switching from an importing mode of operation to an exporting mode of operation. In GB, by setting the switching time to a short interval (1µs) the default option as defined in Article 15(3)(b) of the E&R NC would be for the automatic disconnection too take place. As GB System Operator, NGESO would not wish all Storage plants to trip at the same time so the specific settings would be included within the Bilateral Agreement which would be consistent with the approach adopted for Pumped Storage.

Active Power Requirements on SGUs

E&R NC Article 21 (1b) states that:

In case of absence of control area adequacy in the day-ahead or intraday timeframe, identified pursuant to paragraphs 1 and 2 of Article 107 of Regulation (EU) 2017/1485, and prior to any potential suspension of market activities pursuant to Article 35, a TSO shall be entitled to request assistance for active power from any SGU connected in its LFC area, which does not already provide a balancing service to the TSO, and which, upon the TSO request, shall make available all its active power, conforming to its technical constraints.

Clause 4.6.3 of SDP has been re-drafted to state:

"Under the NCER, the NGESO shall be entitled to request assistance for active power from SGUs which do not already provide a balancing service. SGU's and Defence Service Providers in GB are defined in Table B1 of Appendix B".

The Proposer has since looked at this in further detail and believes the confusion relates to the definition of an SGU in the E&R NC. In GB, the term SGU is not used and clarity is required in how an SGU is defined within the GB arena. This issue is covered in Section 5 of this report. In considering this issue, the general approach is that an SGU for the purposes of the System Defence Plan would be any GB party who is either a User or a Balancing Mechanism (BM) Participant and therefore bound by the requirements of the Grid Code OC's and BC's. A party who falls outside of this criteria would not be able to be instructed or satisfy the requirements of the System Defence Plan and hence would not be deemed to be a SGU. As such, the Proposer has taken the opportunity to update the System Defence and System Restoration Plan (Appendix B of both documents) so it is clear what an 'SGU', 'Defence Service Provider' and 'Restoration Service Provider' is and how this relates to GB Parties. The intention here is to clearly define which GB Parties would be within the scope of E&R NC.

Compliance Testing for Demand Facilities Providing Demand Side Response (Article 45)

E&R NC states that:

"1. Each defence service provider delivering demand response shall execute a demand modification test, after two consecutive unsuccessful responses in real operation or at least every year, following the methodology laid down in Article 41(1) of Regulation (EU) 2016/1388.

2. Each defence service provider delivering demand response low frequency demand disconnection shall execute a low frequency demand disconnection test within a period to be defined at national level and following the methodology laid down in Article 37(4) of Regulation (EU) 2016/1388 for transmission connected demand facilities or according to a similar methodology defined by the relevant system operator for other demand facilities"

To address this issue, the Demand Response Services Code in the GB Grid Code would be updated, with this Modification, to read:

"DRSC.11.7Additional Testing requirements for Network Operators, Non-Embedded Customers and BM Participants who are also Demand Response Providers

DRSC.11.7.1 ***Network Operators****, **Non-Embedded Customers** and **BM Participants** who are also **Demand Response Providers** shall be required to execute a demand modification test after two consecutive unsuccessful responses in the operational environment or at least every year as agreed with **The Company**.*

*DRSC.11.7.2 Each **Network Operator**, **Non-Embedded Customer** and **BM Participant** who are also **Demand Response Providers** and provide demand response low frequency demand disconnection shall execute a low frequency demand disconnection test at least once every three years".*

For GB, the Low Frequency Demand Disconnection test has been set at once every three years to ensure consistency with the frequency of Black Start testing.

In addition where a re-test is required under OC5, the Table in OC5.5.4 would also be updated, with this Modification, to include an entry for Demand Response.

Compliance Testing for Low Frequency Demand Disconnection Relays (Article 47)

E&R NC states that:

"Each DSO and TSO shall execute testing on the low frequency demand disconnection relays implemented on its installations, within a period to be defined at national level and following the methodology laid down in Article 37(6) and Article 39(5) of Regulation (EU) 2016/1388".

To address this issue, the European Compliance Processes in the GB Grid Code would be updated, with this Modification, to read:-

"ECP.A.8.9 Testing of Low Frequency Demand Disconnection schemes

*ECP.A.8.9.1 Each **Non-Embedded Customer** shall execute a low frequency demand disconnection test at least once every three years.*

*ECP.A.8.9.2 Each **Network Operator** shall execute testing on its low frequency demand disconnection relays installed within its network at least once every three years".*

For existing installations, similar requirements have already been added to CC.A.5.4.2 and CC.A.5.4.3 of the Grid Code.

GC0128

Frequency management within a Black Start (Article 27(4))

The majority of changes are based on the Frequency Management Procedure in the SRP (section 3.3). The main issue here is that in GB NGSO generally takes on the role

as overall co-ordinator of the restoration procedure and is considered to be the 'Frequency Leader'. However, the two Transmission Licensees in Scotland do have a role in frequency management under STCP06-1 (Black Start) and on this basis section 3.2.1, 3.3.1, 3.3.2 and 3.3.4 of the System Restoration Plan has been updated to reflect this.

Information Exchange (Article 40)

Article 40 of E&R NC refers to information being exchanged during a Emergency, Blackout or Restoration State. Although the Grid Code already contains provisions for the sharing of information under a whole range of conditions, including a Blackouts and Emergencies, and whilst not strictly necessary, additional text has been added to OC.9.2.5 for the purposes of clarity.

Quick Re-Synchronisation (Article 44(2))

E&R NC states that:

"2. Each restoration service provider which is a power generating module delivering a quick re-synchronisation service shall execute tripping to houseload test after any changes of equipment having an impact on its houseload operation capability, or after two unsuccessful consecutive tripping in real operation, following the methodology laid down in Article 45(6) of Regulation (EU) 2016/631".

To address this issue OC5.7.1(a) would be updated, with this Modification, to read:

"OC5.7.1 General

*(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**. This could include the requirement for a **Generator** to demonstrate that its **Generating Units**, **Power Park Modules** or **Power Generating Modules** within a **Black Start Station**, is capable of delivering a quick re-sycnhronisation service through executing a trip to house load test. Such a test would be assessed against the requirements of the **Black Start Contract** and/or the requirements of ECC.6.3.5.6. The quick re-synchronisation test would generally only be required where the **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."*

(b)

General Updates applicable to GC0127 and GC0128

As part of the implementation of E&R NC into the GB there are number of elements which are common to both GC0127 and GC0128. In general these refer to requirements such as communication facilities and testing. Whilst the majority of requirements of E&R NC are already generally covered in the Grid Code, a few updates to the Grid Code legal text are proposed to align with the E&R NC. These elements

have been introduced following the mapping process which translates the requirements in the E&R NC into the GB framework.

Operational Security during Testing (Article 43(4))

E&R NC states that:

"Each TSO, DSO, SGU, defence service provider and restoration service provider shall not endanger the operational security of the transmission system and of the interconnected transmission system during the test. The test shall be conducted in a way that minimises the impact on system users".

OC5.5.3.3 of the Grid Code would be updated, with this Modification, to read

*"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. Any test conducted shall not place the **User's Plant** and **Apparatus** at risk or endanger the operational security of the **National Electricity Transmission System**. In addition, the test shall be conducted in a way which minimises the impact on other **Users** of the **National Electricity Transmission System**".*

Backup Power Supplies for Communication Systems (Article 48(2))

E&R NC states that:

"Each DSO and SGU identified pursuant to Article 23(4), each TSO and restoration service provider shall test the backup power supply of their communication systems at least every five years".

To address this issue CC.6.5.4.4 and EC.6.5.4.4 of the Grid Code would be updated, with this Modification. As an example and in the case of ECC.6.5.4.4 the additional text included is replicated below with similar text applying for CC.6.5.4.4.

*"ECC.6.5.4.4 Where **Control Telephony** or **System Telephony** is installed, routine testing of such facilities may be required by **The Company** (not normally more than once in any calendar month). The **User** and **The Company** shall use reasonable endeavours to agree a test programme and where **The Company** requests the assistance of the **User** in performing the agreed test programme the **User** shall provide such assistance. In addition, where **Control Telephony** is installed at an **EU Code User's site**, routine testing of the backup power supplies feeding the **Control Telephony** facilities may be required by **The Company** which shall be at least every 5 years".*

4 Impacts & Other Considerations

Under the proposals for GC0096 (Storage) owners of storage facilities will be treated as if they were Generators. It is therefore suggested that anyone who owns and/or operate storage equipment who are caught by the requirements of the GC0096 proposals would also be affected by this Modification as their equipment would be treated as an SGU. In addition, BM parties (including Aggregators) who are caught by the requirements of the Grid Code, would also be considered to be within the scope of these GC0127 proposals.

GC0128

Black Start Service Providers (a term introduced through the GC0125 proposals) will be affected by this GC0128 modification as will SGUs.

Does this modification impact a Significant Code Review (SCR) or other significant industry change projects, if so, how?

No.

Consumer Impacts

This change will facilitate the implementation of the (EU) Emergency and Restoration Network Code which helps to facilitate a harmonised electricity system as part of the package of European Network Codes, and will help to deliver and facilitate significant benefits to the end consumer by ensuring a coordinated security of supply across GB and Europe.

5 Workgroup discussions

The Workgroup convened on five occasions between May 2019 and July 2019 to discuss the perceived issue, detail the scope of the proposed defect, devise potential solutions and assess the proposal in terms of the Grid Code Objectives. The Workgroup will in due course conclude these tasks after this consultation has taken place (taking account of responses to this consultation).

The Workgroup discussed a number of the key attributes under GC0127 and GC0128, these discussions are described below. The Workgroup for GC0127 and GC0128 met and discussed both Modifications due to having the same membership and similar themes in discussion areas. ***This consultation covers both Modifications to save respondents having to respond to two separate consultation documents with the same themes in many areas. The Code Administrator will request amalgamation of the two Modifications at the July Grid Code Review Panel meeting.***

Significant Grid Users

Some Workgroup members highlighted that it was difficult for them to understand whether they were or were not a 'SGU' by using the criteria outlined in Appendix A and B of the SDP and SRP respectively and that there should have (1) been a list of SGUs produced by NGESO (and submitted to the NRA) for them to check whether they were on it; and (2) been notified by NGESO (or the DSO, if applicable) of the fact that they

meet the criteria and therefore are considered to be a SGU for the purposes of E&R NC in GB.

The Proposer stated that they have updated the System Defence and System Restoration Plan, including Appendix B and the Glossary and Definitions so it is clear in GB what is defined as a Defence Service Provider, Restoration Service Provider and Significant Grid User. Appendix B of both documents has been updated which defines what an SGU in GB is considered to be and the measures required. The Proposer advised that it is not practical to provide a list of individual parties but a criteria clearly articulating who would be within the scope of E&R NC. In addition, NGESO will also be notifying those parties, in the near future[3], that they fall within the scope of E&R NC and therefore that they are an SGU. A Workgroup member noted that TSOs in other Member States had provided such a list, confidentially, to their NRA.

Significant Grid Users within scope of GB

The Proposer confirmed that the following would be deemed to be a SGU in GB;

- *Generators who own and operate new and existing Power Generating Modules (i.e. pre-and post RfG) at Large Power Stations or any Generator who owns and operates new and existing Power Generating Modules at a Power Station which is directly connected to the Transmission System or Generator who has a contract with the ESO.*
- *HVDC System Owners and DC Converter Station Owners who are signatories to the CUSC and required to satisfy the requirements of the Grid Code*
- *New and Existing Non-Embedded Customers (Transmission Connected Demand Facilities)*
- *New and Existing Transmission Connected Closed Distribution Systems*
- *Aggregators registered as BM Participants (i.e. Aggregated Demand Facilities who are BM Participants and would be caught by the requirements of BC1 and BC2 of the Grid Code))*

It was noted that this was not consistent with what had been published and submitted by NGESO to Ofgem in December 2018. The Proposer does however fully recognise that it is not clear what actually constitutes an SGU, especially as this term has derived itself from within the framework of the EU Network Codes rather than existing terminology which has used within GB. However, Workgroup members noted that there must; for the purposes of compliance and assurance; be absolute clarity of who is (and who, therefore, is not) a SGU for the purposes of the TSOs, DSOs and SGUs to ensure GB compliance with E&R NC, as the legal requirements centre around ‘SGUs’.

The Proposer stated to the Workgroup that they are fully committed to clarifying the definition of an SGU, Defence Service Provider and Restoration Service Provider and

[3] NGESO outlined to the Workgroup that they were intending to issue these notifications over the summer of 2019.

therefore substantial updates have been made to Appendix A, Appendix B, and the Glossary and Definitions of the SDP and SRP issued on 10th July 2019 for public consultation.

In general, the approach proposed is that Appendix B of the System Defence and System Restoration Plan defines what and SGU in GB is (i.e. a GBSGU). A Defence Service Provider has the same meaning as a SGU in GB and a Restoration Service Provider is a Black Start Service Provider and / or a GB SGU. In addition, the list in Appendix B now includes the measures that are incumbent on GB SGU's.

An extract from the proposed wording in Appendix B of the SRP and SDP is reproduced in Table 1.0 below to give GB stakeholders this clarity.

The Proposer is currently seeking Legal advice, however in assessing the E&R NC, in particular Articles 2, 4, 11.4(c) and 23.4(c) (which are reproduced at the end of this section) it has come to the above view on the basis that Articles 11.4(c) and Articles 23.4(c) require the System Defence Plan and System Restoration Plan to provide a list of SGU's responsible for implementing on their installations, the measures that result from the mandatory requirements set out in Regulation (EU) 2016/631 (Requirements for Generators), Regulation (EU) 2016/1388 (Demand Connection Code) and Regulation (EU) 2016/1447 (HVDC Code) or from National Legislation and a list of measures to be implemented by those SGU's. The proposer firstly notes i) that the requirements of the EU Connection Network Codes only applies to new parties ii) it also considers that there is some scope for defining the list of SGU's through Articles 11.4(c) and Articles 23.4(c) and iii) there would be significant cost to non CUSC Parties and BM Parties, in particular those who are existing, should the SGU cover all permutations and combinations as defined in Article 2. To this end, the Proposer has tried hard to clearly define (though amendments to the System Defence Plan and System Restoration Plan) what an SGU within GB is and how the criteria within Article 2 of E&R NC relates to those parties.

On the other hand, one workgroup member considers that the definition of an SGU, System Defence Provider and System Restoration Provider within E&R NC is, in their view, much wider than that suggested by the Proposer and is therefore considering an "Alternative" to the Proposers solution along those lines.

Table B1 below (which was prepared by the Proposer) details which GB Parties would, according to NGESO, be within the scope of E&R NC.

EU Criteria	**New or Existing**	**List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)**	**Measures of the System Defence Plan**	**Comments**
Existing and new Power Generating modules classified as Type C and D in accordance with the criteria set out in Article 5 of Commission Regulation (EU) 2016/631	New	Any Generator who is an EU Code User who has a CUSC Contract with the ESO and owns or operates a Type C or Type D Power Generating Module	Applicable Grid Code requirements: PC, ECC, ECP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC In satisfying the above Grid Code requirements, Generators with a CUSC Contract who own or operate a Type C or Type D Power Generating Module would meet one or more of the requirements of the System Defence Plan.	BC 3* applies to Large Power Stations and directly connected Power Stations. The requirements for LFSM-O are covered in ECC.6.3.7.1.
	Existing	Any Generator who is a GB Code User who has a CUSC Contract with the ESO	Applicable Grid Code requirements: PC, CC, CP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC Generators with a CUSC Contract	BC 3* applies to Large Power Stations and directly connected Power Stations. The requirements for LFSM-O are covered in ECC.6.3.7.1.

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
			would need to comply with the applicable requirements of the Grid Code and in doing so would satisfy one or more measures of the System Defence Plan.	
Existing and new power generating modules classified as Type B in accordance with the criteria set out in Article 5 of Regulation (EU) 2016/631, where they are identified as SGU's in accordance with Article 11(4)	New	Any Generator who is a EU Code User and has a CUSC Contract with the ESO and owns or operates a Type B Power Generating Module	Applicable Grid Code requirements: PC, ECC, ECP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC In satisfying the above Grid Code requirements, Generators with a CUSC Contract who own or operate a Power Station comprising a Type B Power Generating Module would meet one or more of the requirements of the System Defence Plan.	As the Generator has a CUSC contract and obliged to satisfy the requirements of the Grid Code, then such parties would be within the scope of NCER. BC 3* applies to Large Power Stations and directly connected Power Stations.
	Existing	Any Generator who is a GB Code User and who has a	Applicable Grid Code requirements: PC, CC, CP, OC1, OC5, OC6, OC7,	As the Generator has a CUSC contract and obliged to satisfy the requirements of the Grid Code, then such parties would be within the scope of NCER.

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
		CUSC Contract with the ESO	OC10, OC12, BC1, BC2, BC3*, DRC In satisfying the above Grid Code requirements, Generators with a CUSC Contract would meet one or more of the requirements of the System Defence Plan.	BC 3* applies to Large Power Stations and directly connected Power Stations.
Existing and new Transmission-connected demand facilities	New	Any Non-Embedded Customer who is an EU Code User and who has a CUSC Contract with the ESO	Applicable Grid Code requirements: PC, ECC, ECP, DRSC*, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC In satisfying the above Grid Code requirements, Non-Embedded Customers would meet one or more of the requirements of the System Defence Plan.	BC 3* and the DRSC* would also apply if the Non-Embedded Customer provided Ancillary Services.
	Existing	Any Non-Embedded Customer who is a	Applicable Grid Code requirements: PC, CC, CP, OC1, OC5, OC6, OC7,	BC 3 would apply if the Non-Embedded Customer provided Ancillary Services.

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
		GB Code User and has a CUSC Contract with the ESO	OC10, OC12, BC1, BC2, BC3*, DRC In satisfying the above Grid Code requirements, Non-Embedded Customers would meet one or more of the requirements of the System Defence Plan.	
Existing and new Transmission Connected Closed Distribution Systems	New	Any Non-Embedded Customer who is an EU Code User and who has a CUSC Contract with the ESO	Applicable Grid Code requirements: PC, ECC, ECP, DRSC*, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC In satisfying the above Grid Code requirements, Non-Embedded Customers would meet one or more of the requirements of the System Defence Plan.	The Closed Distribution System is considered as a Private Network and not registered as a Network Operator or IDNO. The DRSC and BC3 would apply if the Non-Embedded Customer provided Ancillary Services.
	Existing	Any Non-Embedded Customer who is a	Applicable Grid Code requirements: PC, CC, CP, OC1, OC5, OC6, OC7,	The Closed Distribution System is considered as a Private Network and not registered as a Network Operator or IDNO

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
		GB Code User and which has a CUSC Contract with the ESO	OC10, OC12, BC1, BC2, BC3*, DRC In satisfying the above Grid Code requirements, Non-Embedded Customers would meet one or more of the requirements of the System Defence Plan.	
Providers of redispatching of power generating modules or demand facilities by means of aggregation and providers of active power reserve in accordance with Title 8 of Regulation 2017/1485	New & Existing	BM Participants	(ECC/CC 6.5 only) DRSC*, BC1, BC2, BC3*	In general a BM Party will also be a User and in this case they would be caught by the requirements of NCER. Users can fall into different categories and these are detailed above. A BM party who is not defined as a User (such as an Aggregator) will have to satisfy the requirements of BC1 and BC2 and ECC/CC.6.5, and therefore would be considered to meet one or more requirements under the System Defence Plan. A BM Party who also satisfies the requirements of the DRSC (ie they offer Ancillary Services and caught by the requirements of DCC (ie EU Code User's) may also have to satisfy the requirements of BC3 but this would depend on the type of Ancillary Service offered.

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
				In all cases a BM party would be treated as having to meet the requirements of NCER.
Existing and new high voltage direct current (HVDC) Systems and direct current connected Power Park Modules in accordance with the criteria set out in Article 4(1) of commission Regulation (EU) 2016/1447	New	HVDC System Owners and Generators in respect of Transmission DC Converters and/or DC Connected Power Park Modules who are EU Code Users and have a CUSC Contract with the ESO	Applicable Grid Code requirements: PC, ECC, ECP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC In satisfying the above Grid Code requirements, HVDC System Owners and Generators in respect of DC Connected Power Park Modules with a CUSC Contract would meet one or more of the requirements of the System Defence Plan.	BC 3* applies to HVDC System Owners. The requirements for LFSM-O for HVDC Systems and DC Connected Power Park Modules are covered in ECC.6.3.7.1.

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
	Existing	DC Converter Station Owners and Generators in respect of Transmission DC Converters who are GB Code Users and have a CUSC Contract with the ESO	Applicable Grid Code requirements: PC, CC, CP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC In satisfying the above Grid Code requirements, DC Converter Station Owners with a CUSC Contract would meet one or more of the requirements of the System Defence Plan.	BC 3* applies to DC Converter Station Owners

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
Existing and new Type A Power Generating Modules in accordance with the criteria set out in Article 5 of Regulation (EU) 2016/631, to existing and new Type B Power Generating Modules other than those referred to in paragraph 2(b), as well as to existing and new demand facilities, closed distribution systems and third parties providing demand response where they qualify	New	Any Generator who is an EU Code User and has a CUSC Contract with the ESO and owns or operates a Type A Power Generating Module. Non Embedded Customers and BM Participants in respect of Closed Distribution Systems and Aggregators.	Applicable Grid Code requirements: PC, ECC, ECP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC In satisfying the above Grid Code requirements, Generators with a CUSC Contract who own or operate a Power Station comprising a Type A Power Generating Module would meet one or more of the requirements of the System Defence Plan in the same way as a Generator who owns or operates a Type B Power Generating Module	As the Generator has a CUSC contract and obliged to satisfy the requirements of the Grid Code, then such parties would be within the scope of NCER. BC 3* applies to Large Power Stations and directly connected Power Stations. Type A Power Generating Modules are required to satisfy the requirements of ECC.6.3.7.1 (LFSM-O).

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
as defence service providers pursuant to Article 4(4)				

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
Existing and new Type A Power Generating Modules in accordance with the criteria set out in Article 5 of Regulation (EU) 2016/631, to existing and new Type B Power Generating Modules other than those referred to in paragraph 2(b), as well as to existing and new demand facilities, closed distribution systems and third parties providing demand response where they qualify	Existing	Any Generator Registered as a GB Code User which has a CUSC Contract with the ESO and owns or operates a Generating Unit or Power Park Module and is required to satisfy the requirements of the Grid Code Non-Embedded Customers and BM Participants in respect of Closed Distribution Systems and Aggregators.	Applicable Grid Code requirements: PC, CC, CP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC In satisfying the above Grid Code requirements, Generators with a CUSC Contract would meet one or more of the requirements of the System Defence Plan.	As the Generator has a CUSC contract and obliged to satisfy the requirements of the Grid Code, then such parties would be within the scope of NCER. BC 3* applies to Large Power Stations and directly connected Power Stations.

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
as defence service providers pursuant to Article 4(4)				
Type A and Type B Power Generating Modules referred to in paragraph 3, demand facilities and closed distribution systems providing demand response may fulfil the requirements of this Regulation either directly or indirectly through a third party under the terms and conditions set out in accordance with Article 4(4)	New and Existing	BM Participants	BC1, BC2,(ECC/CC.6.5 applies only)	This is a non-mandatory requirement. If a BM Party owns or operates a Type A or Type B Power Generating Module, this would fall under the requirements of RfG. They would also need to comply with the requirements of BC1 and BC2 and therefore fall under the scope of NCER. If the party is also a EU Code User, the wider requirements of the Grid Code would apply (ie ECC's ,ECP's and OC's would also apply in which case they would also considered to be within the scope of NCER. If an existing BM Party owns or operates a Small Power Station they would need to meet the requirements of BC, BC2 and CC.6.5. They would be treated as being within the scope of NCER. If an Aggregator registered as a BM Party has generation and/or demand and required to meet the requirements of the applicable

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
				Balancing Codes this would also fall under the requirements of NCER
This Regulation shall apply to energy storage units of a SGU, a defence service provider or restoration service provider which can be used to balance	New	Any EU Code Generator which has a CUSC Contract with the ESO and which owns and operates Electricity Storage Modules would be classified as a	Applicable Grid Code requirements: PC, ECC, ECP, OC1, OC5, OC6 (in particular OC6.6) , OC7, OC10, OC12, BC1, BC2, BC3*, DRC	Under the GC0096 proposals, when a Storage Plant is in an importing mode of operation, and the System Frequency falls automatic tripping is required in accordance with the requirements of OC6.6. Within GB, the capability to switch from import to export during low system frequency conditions is not required. Tripping will be initiated prior to the start of Low Frequency Demand Disconnection which occurs at 48.8Hz.

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
the system, provided that they are identified as such in the system defence plans restoration plans or service contract.		Storage User as defined under the GC0096 Grid Code proposals	Under the GC0096 proposals, Electricity Storage Modules are treated in the same way as Power Generating Modules. Generators who have a CUSC Contract with the ESO who own and/or operate Electricity Storage Modules would therefore be within the scope of NCER.	All the other requirements of the Grid Code apply and therefore Storage Units caught under the proposed requirements of GC0096 would be considered to be within the scope of NCER.
	Existing	Any CUSC Party who owns or operates Storage plant	Applicable Grid Code requirements: PC, CC, CP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC	A CUSC Party owning a Storage plant would be required to satisfy the requirements of the Grid Code and hence would be considered to be within the scope of NCER. The technical requirements applicable to the storage plant including the ability to trip during low system frequencies will be as specified in the Bilateral Agreement.

Table 1.0

In addition, it is also very important to clarify those GB parties who would fall outside the scope of E&R NC and hence those parties who would not be classified as a SGU within GB, and therefore not have to comply with the requirements of E&R NC. These are also clarified in Appendix B of the System Defence and System Restoration Plan and reproduced below.

- *Any Embedded Generator in respect of a Medium or Small Power Station which does not have a CUSC Contract the ESO[4].*
- *Any Generator in respect of a Licence Exempt Embedded Medium Power Station (LEEMPS).*
- *A Demand Response Provider who does not have a CUSC Contract with the ESO*
- *Any HVDC System Owner or DC Converter Station Owner or Generator who owns and operates an HVDC System or DC Converter Station or Transmission DC Converter or DC Connected Power Park Module which does not have a CUSC Contract or Interconnector Agreement with the ESO*
- *BM parties that are not required to meet the requirements of BC1, BC2 and CC.6.5 or ECC.6.5.*

  .
- *Any party which is not required to satisfy the requirements of the Grid Code.*

For the avoidance of doubt, the ESO, Transmission Licensees and Distribution Network Operators are not classified as Significant Grid Users (SGU) though they are required to satisfy the requirements of the NCER.

Notification

Some Workgroup members; noting the requirements in Articles 12 (3)-(5) and 24 (3)-(5); stated that they had not been notified by NGESO (or DSO, if applicable) of the fact that they are an SGU in the manner required by the E&R NC. The Proposer stated that they had notified SGUs that they were captured by publishing the SDP and the SRP with the criteria outlined in Annex A on the NGESO website. A Workgroup member highlighted that if the E&R NC had meant for this notification action to be completed in this way it would have stated for it to be published on the website as it does in some other areas of the Network Codes and therefore, this was not, in their view, the intent of the word 'notification' in E&R NC. The Workgroup member expanded to state that notification maybe considered by NGESO to be onerous but if this is what is required by EU law this is what should happen or have happened. An example of another notification was highlighted in Article 24(6) (b) in terms of how the SGUs have implemented and maintained the measures required.

The initial view of the Proposer was to publish an Open Letter to fulfil this obligation on NGESO to notify where potential SGUs could themselves self-determine whether they were an SGU. Workgroup members did not feel that this would sufficiently fulfil the

[4] NGESO.

NGESO's (or, if relevant, DSO's) obligation to notify. Workgroup members also noted that if there were notified of being an SGU that they would have a further twelve months from the date of the notification to implement their obligations.

It was additionally highlighted that it is not just the Transmission System Operator that is obligated to carry out the notification to SGUs but that the Distribution System Operators also need to carry out some of the notifications to SGUs. Some Workgroup members also discussed that even if they had new obligations outlined in the Grid Code that if they had not been notified, according to E&R NC, that they would not have to comply with them as a result as the Grid Code changes for E&R NC purposes (as per GC0127 and GC0128) were applicable to SGUs.

The Proposer outlined that as they have a two-stage approach to the implementation of the E&R NC (i.e. those requirements to be in place by 18 December 2019 and those to be in place by 18 December 2022) that there would have to be two notifications to SGUs on any new obligations when they have been fully developed within the Grid Code modifications required.

The Proposer acknowledged there were two issues here. The first was the definition of an SGU which has been clarified through Appendix B of the SDP and SRP issued by NGESO for public consultation on 10th July 2019. The second is how would a GB party who is within the scope of E&R NC be notified that they were an SGU. On the basis that stakeholders considered an Open Letter not to be sufficient at the last meeting, the Proposer agreed to take this issue away and consider a more appropriate solution.

The Proposer subsequently clarified to the Workgroup that they would be sending a notification letter to each SGU, Defence Service Provider and/or Restoration Service Provider as applicable. A Workgroup member questioned whether this would detail all of the measures required to be implemented by the SGU; as per the requirements in Articles 12 (3)-(5) and 24 (3)-(5). The Proposer stated that the revised System Defence and System Restoration Plan included these measures. A Workgroup member stated that they believe that when the E&R NC was drafted that the intention of it was for it to be clear to each SGU what measure(s) they needed to undertake and by when. The Proposer noted that with the proposed approach set out in Appendix A and B of the SDP and SRP that if the party does not have a CUSC contact with the NGESO or they are not a BM Participant, then there would be significant costs for those parties if they were classified as an 'SGU. If non-CUSC or non-BM participating parties were defined as 'SGUs' then the cost of instructing such parties would not be insignificant. However, a Workgroup member noted that the scope of E&R NC, as set out in Article 2, did extend to Type B (1MW plus) generation and could, as per Article 2(3), extend to Type A (800W plus) generation at both transmission and distribution.

In response, the Proposer reiterated their view of the treatment of a SGU, Defence Service Provider and Restoration Service Provider as discussed in the earlier section titled Significant Grid Users in GB. The Proposer is fully aware that a Workgroup member may raise a "potential Alternative" with regard to this Interpretation.

Updates to the System Defence and System Restoration plans following Ofgem approval and link to GC0127 and GC0128

The Proposer highlighted to the Workgroup within their proposed solution for GC0127 and GC0128 that the position outlined does not match what had been published by

NGESO in the System Defence Plan and the System Restoration Plan submitted to Ofgem on 18 December 2018. It was noted that Ofgem had; in their letter[5] of 21st June 2019,requested amendments to the two Plans submitted in December 2018 and as a consequence the System Defence Plan and System Restoration Plan had been substantially updated by NGESO and released for consultation[6]. The timetable for these two Plans is as follows:

Stage	Date
Submission of the SDP and SRP to Ofgem	18/12/2018
Request for amendment from Ofgem	w/c 17/06/2019
Electricity System Operator/Transmission System Operator to consult on amendments	Consultation opened on 10 July 2019
Resubmission of the SDP and SRP to Ofgem	By 18/08/2019
Ofgem decision on whether to approve the SDP and SRP	Two months following re-submission – around 18 October 2019

The Workgroup concluded that it would be most efficient and pragmatic to carry out this Workgroup Consultation at the same time as the NGESO July Consultation on the amendments to the SDP and SRP.

Definitions

The Proposer outlined their position with regard to the proposed definitions, for the purposes of GC0127 and GC0128, below;

[5] https://www.ofgem.gov.uk/publications-and-updates/request-amendment-electricity-system-operator-s-proposal-under-eu-emergency-and-restoration-network-code?utm_medium=email&utm_source=dotMailer&utm_campaign=Daily-Alert_21-06-2019&utm_content=Request+for+amendment+to+the+Electricity+System+Operator%e2%80%99s+proposal+under+the+EU+Emergency+and+Restoration+Network+Code&dm_i=1QCB,6CHYE,UWA0T7,P3CJO,1

[6] https://www.nationalgrideso.com/codes/european-network-codes/meetings/emergency-and-restoration-consultation-open

Definition	Meaning
Defence Service Provider	A Defence Service Provider is a legal entity with a legal or contractual obligation to provide a service contributing to one or several measures of the System Defence Plan. In GB, a Defence Service Provider has the same meaning as a GB Significant Grid User (GB SGU)
Restoration Service Provider	A restoration service provider refers to "a legal entity with a legal or contractual obligation (including a Black Start Service Provider) to provide a service contributing to one or several measures of the restoration plan". In GB, a Restoration Service Provider is a GB Significant Grid User (GB SGU) and/or a Black Start Service Provider.

GC0127 Article specific discussions

E&R NC Articles covered in this modification:

Article 15(3) Automatic under frequency control
Article 21(1)(b) Assistance for active power
Article 45 Compliance testing
Article 47, Compliance testing of low frequency demand disconnection relays

Article 15(3) and (4) Automatic under frequency control

The Proposer stated that this would be one of the main amendments required to the Grid Code as a result of the SDP. It was noted that there is a requirement for storage units to automatically switch from demand mode to generation mode and that this had not been covered as part of the ongoing modification to the Grid Code on Storage (GC0096). As noted above the Proposer now believes this issue has been addressed through the approach detailed in Section 3 of this document.

Article 21(1)(b) Assistance for active power

The Workgroup concluded that no extra requirements were needed in the Grid Code as a result of this Article.

Test Plan and Article 43

A Workgroup member questioned where the test plan was as required in Article 43 (2) of the E&R NC which states that:

"*By 18 December 2019 each TSO shall define a test plan in consultation with the DSOs, the SGUs identified pursuant to Articles 11(4) and 23(4), the defence service providers and the restoration service providers. The test plan shall identify the equipment and capabilities relevant for the system defence plan and the restoration plan that have to be tested*."

The Workgroup member stated that a test plan was required to be developed by NGESO, in consultation with DSOs and SGUs. The Proposer stated that there would be testing requirements outlined for Article 44-47. To address this concern amendments have been proposed to be introduced to the Grid Code (via GC0127 and GG0128) in respect of Articles 44, 45 and 47 as noted above in Section 3. In the view of the Proposer there is no requirement for amendments in respect of Article 46 as these are already covered by the proposals under consideration as part of the GC0125 Modification. However, the Proposer has yet to clarify when the consultation, with DSOs and SGUs, on the test plan required by Article 43(2) will be undertaken.

Article 47

The Proposer outlined that this was around protection and they required some more information on how this is completed. A Workgroup member took away an action to look into this and provide this to the Workgroup. Additional amendments have also been proposed to be introduced to the Grid Code via GC0127 and GC0128 as noted in Section 3 above as part of this requirement.

Other

A Workgroup member noted that in their view there also need a for a dedicated testing procedure as a result of Article 51 (2) which states that:

"*In addition, where deemed necessary by the TSO for the effectiveness of the restoration plan, each TSO shall execute operational testing of parts of the restoration plan, in coordination with the DSOs identified pursuant to Article 23(4) and the restoration service providers. The TSO shall set out, in consultation with the DSOs and restoration service providers, those operational tests in a dedicated testing procedure.*"

The Workgroup member noted that the testing procedure would need to be prepared in consultation with DSOs and SGUs and that the operational testing would be executed by the TSO after coordination with the DSOs and SGUs. The Workgroup noted this and agreed to develop a solution. The Proposer has added additional commentary to this

item in the mapping table noting that internal procedures do exist although some further work is still necessary.

GC0128 Article specific discussions

Activation of re-energisation procedure Article 27(4)

Frequency leader

It was noted that in respect of Article 27 that the allocation of the functional responsibility of this Article for GB purposes in terms of the re-energisation procedure had been allocated by Ofgem[7] and that this could not be changed. In general, NGESO is responsible for the re-energisation procedure with specific responsibilities defined in STCP 06-1 (Black Start). The Workgroup and the Proposer agree that these responsibilities were not well articulated in the SRP and therefore the Proposer has suggested amendments to sections 3.2.1, 3.3.1, 3.3.2 and 3.3.4 of the Grid Code to clarify the situation.

Is there discrimination and if so how is this justified?

A Workgroup member questioned why there were different in treatment between Types B, C and D generation within the proposed definition of a SGU in the SRP (and SDP). The Workgroup member requested that the Proposer justify as to why Type B, Type C and Type D generator were being treated differently; i.e. with two identical plant, one would be categorised as a SGU (if connected at transmission or embedded with a CUSC contract or being a BM Participant) and one would not (if connected at distribution but without a CUSC contract or not being a BM participant).

It was also noted that Embedded Generation which does not have a CUSC contract or is not a BM Participant (i.e. not part of an Aggregator, which is bound by the requirements of BC1 and BC2) then it is not impacted by the GC0127 or GC0128 Modifications.

The Proposer clarified that this issue is similar to that raised through Grid Code Consultation GC0106 (*https://www.nationalgrideso.com/codes/grid-code/modifications/gc0106-data-exchange-requirements-accordance-regulation-eu-20171485*) which had resulted in the formation of Grid Code Working Group GC0117 https://www.nationalgrideso.com/codes/grid-code/modifications/gc0117-improving-transparency-and-consistency-access-arrangements GC0117 seeks to review the definitions of Large, Medium and Small Power Stations in the GB so that Generation across GB (based on size) would have to progress through the same connection process and submit the same data required under the Grid Code. There are similar issues with the treatment of GB Generation so far as the implementation of NCER is

[7] https://www.ofgem.gov.uk/publications-and-updates/minded-decision-assignment-tso-obligations-under-three-eu-network-codes

concerned. However, a Workgroup member noted that GC0117, if applicable (and approved by Ofgem) would only address part of the discriminatory treatment that arose with GC0127 and GC0128 and would not, for example, address the difference in treatment for Type B generators. Workgroup members noted that if GC0117 adopted a threshold between Large and Small Power Stations of 10MW this would automatically include Type C and Type D PGMs within the scope of the Grid Code and hence the requirements of GC0127 and GC0128 would apply to them in the longer term. However, it was noted that there was the potential for other solutions or thresholds to be raised by other Workgroup members which may affect the eventual outcome.

GC0096 Energy Storage modification implications on GC0127 and GC0128

The Workgroup noted the recent GCRP decision[8] for GC0096 to be sent back to its Workgroup for further work ahead of being submitted to the Authority for decision. They discussed the fact that as these GC0127 and GC0128 Modifications are for compliance for the E&R NC that they should not be reliant on a decision on another Modification (GC0096)

The Code Administrator and Workgroup decided that the best approach would be to 'pull' the GC0096 proposed definitions and related text that would be required for (GC0127 and GC0128) to be implemented into those two Modifications. This is related to Article 15(3) of the E&R NC.

Due to this decision and approach adopted the proposed changes that have been lifted from the proposed GC0096 legal text are highlighted in blue in the draft Legal Text for GC0127 and GC0128. This means that if GC0096 does not get approved by the Authority for any reason, or it is sent back for further work, that GC0127 and GC0128 can be fully implemented.

Storage in the context of GC0127 and GC0128

The Workgroup also discussed whether existing storage parties should be captured by these two Modifications (for the avoidance of doubt, new storage parties would be captured). The Proposer felt that this should not be the case but also recognised that the E&R NC does apply to both new and existing parties. The updates proposed as part of these two Modifications are generally considered minor. The parties most likely to be affected are those who own and operate existing storage plant. Since storage plant is now required to trip when in an import mode of operation and system frequency is low and these conditions are subject to the requirements of the Bilateral Agreement it is considered these requirements are minor. As to the rationale for the treatment of storage this has been clarified in Section 3 above.

Balancing Mechanism Participants

Under the July 2019 revised amendments to the System Defence Plan and System Restoration Plan Appendix B now defines what an SGU is which extends to BM

[8] The decision was made at the 27 June 2019 Grid Code Review Panel meeting.

Participants who are required to satisfy the requirements of BC1 and BC2 of the Grid Code.

High Priority Significant Grid Users

The Proposer noted that as request by Ofgem in their June 2019 letter the Appendix C of the System Defence Plan and System Restoration Plan have been updated by NGESO in July to now define what a 'High Priority Significant Grid User' is in the context of GB.

The Proposer stated for the purposes of the System Defence Plan a 'High Priority Significant Grid User', as defined in in Appendix C, would be one of the following:

- Generating Units, Power Park Modules and Power Generating Modules at a Power Station directly connected to the National Electricity Transmission System with priority given to Synchronous Generation; or
- Generating Units, Power Park Modules and Power Generating Modules at a Power Station with a Registered Capacity of 100MW or more with priority given to Synchronous Generation.

The Proposer stated for the purposes of the System Restoration Plan a 'High Priority Significant Grid User', as defined in in Appendix C, would be one of the following:

- A Black Start Service Provider; or
- Generating Units, Power Park Modules and Power Generating Modules at a Power Station directly connected to the National Electricity Transmission System with priority given to Synchronous Generation; or
- Generating Units, Power Park Modules and Power Generating Modules at a Power Station with a Registered Capacity of 100MW or more with priority given to Synchronous Generation.

A Workgroup member questioned whether the Electricity Supply Emergency Code (ESEC) priority user list of protected sites would be included as High Priority SGUs. The Proposer confirmed that they were not as they were already covered as part of National Legislation.

It was also confirmed that for the purposes of the SDP and SRP Appendix C approach that there are around a thousand such sites in GB that are considered to be High Priority SGUs. A Workgroup member questioned whether these sites had been contacted by NGESO (or the DSOs) to work in co-ordination with them to understand their needs. NGESO stated that they would consider whether the High Priority SGUs should just cover those sites as per Appendix C of the SDP and SRP respectively or whether this should be extended to all Distribution Connected Generators in which case there would be thousands of parties that would have classified as 'High Priority SGUs; and who would then need to have been contacted to work in co-ordination with NGESO in forming their Restoration and Defence Plans. In relation to this issue NGESO have

been in contact with Ofgem after the last Workgroup meeting and the view from Ofgem was that as these sites were already part of National Legislation and there was no need for them to be included in the list of High Priority Significant Grid Users.

IDNOs and Closed Distribution Systems

A Workgroup member stated that their interpretation of the wording in E&R NC Articles 2 and 24 (2) (d) was that there were E&R NC requirements that apply to the IDNOs and Closed Distribution Systems (CDSOs), Type B and Type C PGMs in GB, as well as Distribution Connected generators who should have been contacted and their needs taken on board by NGESO when developing the SDP and SRP.

The Proposer agrees that Transmission Connected IDNOs and Transmission Connected Closed Distribution Systems would be within the scope of E&R NC but not those which are connected to the Distribution network. This issue is resolves around the treatment of SGUs, Defence Service Providers and Restoration Service Providers as discussed earlier in this section.

Implementation of the restoration plan

In respect of implementation of the restoration plan as described in Article 24, as it pertains to High Priority SGUs, IDNOs and CDSOs, and parties connected at Distribution including Types B, C and D PGMs. A Workgroup member stated that as a result of the discussions in the Workgroup that they would like to raise a potential alternative solution to ensure that GC0128 cover this implementation aspect.

The Workgroup will be considering this during this Workgroup Consultation.

Please note Question Q6 in your response proforma, the Workgroup would like to seek your view on this interpretation.

Q6. A Workgroup member has an alternate interpretation of a SGU, SRP and SDP as part of the modification and is considering raising an alternative solution; what are your views on this?

Activation instructions

The Workgroup discussed Article 40(1) (b) (i to iv) and it was noted that there was a requirement to have an activation plan for restoration of the system following a black out. They discussed the fact that there was an activation plan outlined in SOGL Article 18 and that this activation plan had not been implemented into the Grid Code. Some Workgroup members stated that they thought it should have been. The Proposer noted this and has amended section 2.1.1 of the System Restoration Plan.

Summary of amendments to the Grid Code as part of GC0127 and GC0128

The Proposer stated that there would be no new major requirements proposed as part of these two Modifications for any Grid Code User to undertake other than those which should already be undertaken as part of their existing Grid Code obligations. This is based on the interpretation of the E&R NC by NGESO as Proposer. The Workgroup did discuss this. One Workgroup member did however have an alternative interpretation and noted that as a result of being classified as an SGU for the purposes of E&RNC that Grid Code Users would then have additional requirements, which stem from E&R NC, that they would be bound to comply with.

Extracts from Articles 2, 4, 11.4(c) and 23.4 (c) of E&R NC

Article 2 of E&R NC States:

1. *This Regulation shall apply to TSOs, DSOs, SGUs, defence service providers, restoration service providers, balance responsible parties, balancing service providers, nominated electricity market operators ('NEMO') and other entities designated to execute market functions pursuant to Commission Regulation (EU) 2015/1222 (1) and to Commission Regulation (EU) 2016/1719 (2)*

2. *In particular, this Regulation shall apply to the following SGUs:*
   - *(a) existing and new power generating modules classified as type C and D in accordance with the criteria set out in Article 5 of Commission Regulation (EU) 2016/631 (3);*
   - *b) existing and new power generating modules classified as type B in accordance with the criteria set out in Article 5 of Regulation (EU) 2016/631, where they are identified as SGUs in accordance with Article 11(4) and Article 23(4);*
   - *(c) existing and new transmission-connected demand facilities;*
   - *(d) existing and new transmission connected closed distribution systems;*
   - *(e) providers of re-dispatching of power generating modules or demand facilities by means of aggregation and providers of active power reserve in accordance with Title 8 of Regulation (EU) 2017/1485; and*
   - *(f) existing and new high voltage direct current ('HVDC') systems and direct current-connected power park modules in accordance with the criteria set out in Article 4(1) of Commission Regulation (EU) 2016/1447 (1).*

3. *This Regulation shall apply to existing and new type A power generating modules, in accordance with the criteria set out in Article 5 of Regulation (EU) 2016/631, to existing and new type B power generating modules other than those referred to in paragraph 2(b), as well as to existing and new demand facilities, closed distribution systems and third parties providing demand response where they qualify as defence service providers or restoration service providers pursuant to Article 4(4).*

4. *Type A and type B power generating modules referred to in paragraph 3, demand facilities and closed distribution systems providing demand response may fulfil the requirements of this Regulation either directly or*

indirectly through a third party, under the terms and conditions set in accordance with Article 4(4).

5. *This Regulation shall apply to energy storage units of a SGU, a defence service provider or a restoration service provider, which can be used to balance the system, provided that they are identified as such in the system defence plans, restoration plans or in the relevant service contract.*

6. *This Regulation shall apply to all transmission systems, distribution systems and interconnections in the Union except transmission systems and distribution systems or parts of the transmission systems and distribution systems of islands of Member States of which the systems are not operated synchronously with Continental Europe, Great Britain, Nordic, Ireland and Northern Ireland or Baltic synchronous area, provided that this non-synchronous operation does not result from a disturbance.*

7. *In Member States where more than one transmission system operator exists, this Regulation shall apply to all transmission system operators within that Member State. Where a transmission system operator does not have a function relevant to one or more obligations under this Regulation, Member States may provide that the responsibility for complying with those obligations is assigned to one or more different, specific transmission system operators.*

8. *The TSOs of Lithuania, Latvia and Estonia are, as long as and to the extent that they are operating in a synchronous mode in a synchronous area where not all countries are bound by Union legislation, exempted from the application of Articles 15, 29 and 33, unless otherwise provided for in a cooperation agreement with third country TSOs constituting the basis for their cooperation concerning secure system operation in accordance with Article 10.*

Article 4 of E&R NC states

1. *When applying this Regulation, Member States, regulatory authorities, competent entities and system operators shall:*

(a) apply the principles of proportionality and non-discrimination;

(b) ensure transparency;

(c)apply the principle of optimisation between the highest overall efficiency and lowest total costs for all parties involved;

(d) ensure that TSOs make use of market-based mechanisms as far as is possible to ensure network security and stability;

(e) respect technical, legal, personal safety and security constraints;

(f) respect the responsibility assigned to the relevant TSO in order to ensure system security, including as required by national legislation;

(g) consult with relevant DSOs and take account of potential impacts on their system;

And

(h) take into consideration agreed European standards and technical specifications.

2. *Each TSO shall submit the following proposals to the relevant regulatory authority in accordance with Article 37 of Directive 2009/72/EC for approval:*

(a) the terms and conditions to act as defence service providers on a contractual basis in accordance with paragraph 4;

(b) the terms and conditions to act as restoration service providers on a contractual basis in accordance with paragraph 4;

(c) the list of SGUs responsible for implementing on their installations the measures that result from mandatory requirements set out in Regulations (EU) 2016/631, (EU) 2016/1388 and (EU) 2016/1447 and/or from national legislation and the list of the measures to be implemented by these SGUs, identified by the TSOs under Art. 11(4)(c) and 23(4)(c);

(d) the list of high priority significant grid users referred to in Articles 11(4)(d) and 23(4)(d) or the principles applied to define those and the terms and conditions for disconnecting and re-energising the high priority grid users, unless defined by the national legislation of Member States.

(e) the rules for suspension and restoration of market activities in accordance with Article 36(1);

(f) specific rules for imbalance settlement and settlement of balancing energy in case of suspension of market activities, in accordance with Article 39(1);

(g) the test plan in accordance with Article 43(2).

3. *Where a Member State has so provided, the proposals referred to in points (a) to (d) and (g) of paragraph 2 may be submitted for approval to an entity other than the regulatory authority. Regulatory authorities and entities designated by the Member States pursuant to this paragraph shall decide on the proposals referred to in paragraph 2 within six months from the date of submission by the TSO.*

4. *The terms and conditions to act as defence service provider and as restoration service provider shall be established either in the national legal framework or on a contractual basis. If established on a contractual basis, each TSO shall develop by 18 December 2018 a proposal for the relevant terms and conditions, which shall define at least:*

(a) the characteristics of the service to be provided;

(b) the possibility of and conditions for aggregation; and

(c) for restoration service providers, the target geographical distribution of power sources with black start and island operation capabilities.

5. *By 18 December 2018, each TSO shall notify the regulatory authority or the entity designated by the Member State the system defence plan*

designed pursuant to Article 11 and the restoration plan designed pursuant to Article 23, or at least the following elements of those plans:

(a) the objectives of the system defence plan and the restoration plan, including the phenomena to be managed or the situations to be solved; (b) the conditions triggering the activation of the measures of the system defence plan and the restoration plan;

(c) the rationale of each measure, explaining how it contributes to the objectives of the system defence plan and the restoration plan, and the party responsible for implementing those measures; and

(d) the deadlines set out pursuant to Articles 11 and 23 for the implementation of the measures.

6. *Where a TSO is required or permitted under this Regulation to specify, establish or agree on requirements, terms and conditions or methodologies that are not subject to approval in accordance with paragraph 2, Member States may require prior approval by the regulatory authority, the entity designated by the Member State or other competent authorities of the Member States of these requirements, terms and conditions or methodologies.*

7. *If a TSO deems an amendment to the documents, approved in accordance with paragraph 3, to be necessary, the requirements provided for in paragraphs 2 to 5 shall apply to the proposed amendment. TSOs proposing an amendment shall take into account the legitimate expectations, where necessary, of power generating facility owners, demand facility owners and other stakeholders based on the initially specified or agreed requirements or methodologies.*

8. *Any party can complain against a relevant system operator or TSO in relation to that relevant system operator's or TSO's obligations or decisions under this Regulation and may refer the complaint to the regulatory authority which, acting as dispute settlement authority, shall issue a decision within two months after receipt of the complaint. That period may be extended by a further two months where additional information is sought by the regulatory authority. That extended period may be further extended with the agreement of the complainant. The regulatory authority's decision shall be binding unless and until overruled on appeal.*

Article 11.4(c) NC states

4. In particular, the system defence plan shall include the following elements

(c) a list of the SGUs responsible for implementing on their installations the measures that result from the mandatory requirements set out in Regulation (EU) 2016/631, (EU) 2016/1388 and (EU) 2016/1447 or from national legislation and a list of the measures to be implemented by those SGUs;

Article 23(4)(c) NC states

4. In particular, the restoration plan shall include the following elements:

(c) a list of the SGUs responsible for implementing on their installations the measures that result from mandatory requirements set out in Regulations (EU) 2016/631, (EU) 2016/1388 and (EU) 2016/1447 or from national legislation and a list of the measures to be implemented by those SGUs;

6 Relevant Objectives

Impact of the modification on the Applicable Grid Code Objectives:	
Relevant Objective	Identified impact
(a) To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity	Neutral
(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);	Neutral
(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;	Positive (The ability to request assistance from SGUs and incorporating storage into system defence and restoration will allow for additional system security)
(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	Positive (Discharges the obligations of the Emergency and Restoration code into GB frameworks)
(e) To promote efficiency in the implementation and administration of the Grid Code arrangements	None

7 Implementation

The SDP and SRP must be implemented by 18 December 2019 (2 years after E&R NC entered into force), therefore this modification must also by implemented by 18 December 2019.

This modification will be implemented 10 working days after Authority decision or by the latest date of 17/12/2019.

8 How to respond

The GC0127 & GC0128 Workgroup is seeking the views of Grid Code Parties and other interested parties in relation to the issues noted in this document and specifically in response to the questions highlighted in the report and summarised below:

Standard Workgroup Consultation questions:

Q1: Do you believe that GC0127 & GC0128 Original proposals better facilitate the Grid Code Objectives?

Q2: Do you support the proposed implementation approach?

Q3: Do you have any other comments?

Q4: Do you wish to raise a Workgroup Consultation Alternative request for the Workgroup to consider?

Specific GC0127 & GC0128 Workgroup Consultations Questions:

Q5. Do you think the wording in OC9.2.5 could be improved, if so what do you suggest? Please note that the legal text can be located in Annex 4.

Q6. A Workgroup member has an alternate interpretation of a SGU, SRP and SDP as part of the modification and is considering raising an alternative solution; what are your view on this?

Please send your response using the response proforma which can be found on the National Grid website via the following link:

https://www.nationalgrideso.com/codes/grid-code/modifications/gc0127-eu-code-emergency-restoration-requirements-resulting-system

In accordance with the Grid Code Governance Rules of, Any Authorised Electricity Operator; the Citizens Advice or the Citizens Advice Scotland, The Company or a Materially Affected Party may also raise a Workgroup Consultation Alternative Request. If you wish to raise such a request, please use the relevant form available at the weblink below:

http://www.nationalgrid.com/uk/Electricity/Codes/systemcode/amendments/forms_guidance/

Views are invited upon the proposals outlined in this report, which should be received by **5pm** on **16 August 2019**.

Your formal responses may be emailed to: grid.code@nationalgrideso.com

If you wish to submit a confidential response, please note that information provided in response to this consultation will be published on National Grid's website unless the response is clearly marked "Private & Confidential", we will contact you to establish the extent of the confidentiality. A response market "Private & Confidential" will be disclosed to the Authority in full but, unless agreed otherwise, will not be shared with the Grid Code Review Panel or the industry and may therefore not influence the debate to the same extent as a non-confidential response.

Please note an automatic confidentiality disclaimer generated by your IT System will not in itself, mean that your response is treated as if it had been marked "Private and Confidential"

Annex 1 – Terms of Reference

Workgroup Terms of Reference and Membership

TERMS OF REFERENCE FOR GC0127 WORKGROUP

GC0127 – EU Code Emergency & Restoration: Requirements resulting from System Defence Plan

Responsibilities

1. The Workgroup is responsible for assisting the Grid Code Review Panel in the evaluation of Grid Code Modification Proposal **GC0127 – EU Code Emergency & Restoration: Requirements resulting from System Defence Plan** proposed by Rachel Woodbridge Stocks of National Grid Electricity System Operator in April 2019 and presented to the Grid Code Review Panel on 25 April 2019.

2. The proposal must be evaluated to consider whether it better facilitates achievement of the Grid Code Objectives. These can be summarised as follows:

   (i) *To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity;*

   (ii) *To facilitate 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);*

   (iii) *Subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution systems in the national; and*

   (iv) *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. In conducting its business, the Workgroup will at all times endeavour to operate in a manner that is consistent with the Code Administration Code of Practice principles.*

   (v) *To promote efficiency in the implementation and administration of the Grid Code arrangements.*

Scope

3. The Workgroup must consider the issues raised by the Modification Proposal and consider if the proposal identified better facilitates achievement of the Grid Code Objectives.

4. In addition to the overriding requirement of point 3 above, the Workgroup shall consider and report on the following specific issues:
   a) *Implementation and costs;*

b) Review draft legal text should it have been provided. If legal text is not submitted within the Grid Code Modification Proposal the Workgroup should be instructed to assist in the developing of the legal text; and

c) Consider whether any further Industry experts or stakeholders should be invited to participate within the Workgroup to ensure that all potentially affected stakeholders have the opportunity to be represented in the Workgroup. Demonstrate what has been done to cover this clearly in the report

d) Confirm when GC0127 requirements would apply to Users

e) Are there any cross-code impacts?

f) Consider the impacts on Grid Code Users

- *whether all types of storage are affected or those classified as SGU's*
- *the load disconnection, frequencies and profiles being used*
- *how to maintain the commercial services that are currently provided*
- *Seek a view from the NGESO in regards to the impact on system inertia*

g) Consider how balancing services will be obtained from Users that do not currently provide them

5. As per Grid Code GR20.8 (a) and (b) the Workgroup should seek clarification and guidance from the Grid Code Review Panel when appropriate and required.

6. The Workgroup is responsible for the formulation and evaluation of any Workgroup Alternative Grid Code Modifications arising from Group discussions which would, as compared with the Modification Proposal or the current version of the Grid Code, better facilitate achieving the Grid Code Objectives in relation to the issue or defect identified.

7. The Workgroup should become conversant with the definition of Workgroup Alternative Grid Code Modification which appears in the Governance Rules of the Grid Code. The definition entitles the Group and/or an individual member of the Workgroup to put forward a Workgroup Alternative Code Modification proposal if the member(s) genuinely believes the alternative proposal compared with the Modification Proposal or the current version of the Grid Code better facilitates the Grid Code objectives The extent of the support for the Modification Proposal or any Workgroup Alternative Modification (WAGCM) proposal WAGCM arising from the Workgroup's discussions should be clearly described in the final Workgroup Report to the Grid Code Review Panel.

8. Workgroup members should be mindful of efficiency and propose the fewest number of WACM proposals as possible. All new alternative proposals need to be proposed using the Alternative Request Proposal form ensuring a reliable source of information for the Workgroup, Panel, Industry participants and the Authority.

9. All WAGCM proposals should include the Proposer(s)'s details within the final Workgroup report, for the avoidance of doubt this includes WACM proposals which are proposed by the entire Workgroup or subset of members.

10. There is an option for the Workgroup to undertake a period of Consultation in accordance with Grid Code GR. 20.11, if defined within the timetable agreed by the Grid Code Panel. Should the Workgroup determine that they see the benefit in a Workgroup Consultation being issued they can recommend this to the Grid Code Review Panel to consider.

11. Following the Consultation period the Workgroup is required to consider all responses including any Workgroup Consultation Alternative Requests. In undertaking an assessment of any Workgroup Consultation Alternative Request, the Workgroup should consider whether it better facilitates the Grid Code Objectives than the current version of the Grid Code.

12. As appropriate, the Workgroup will be required to undertake any further analysis and update the appropriate sections of the original Modification Proposal and/or WAGCM proposals (Workgroup members cannot amend the original text submitted by the Proposer of the modification) All responses including any Workgroup Consultation Alternative Requests shall be included within the final report including a summary of the Workgroup's deliberations and conclusions. The report should make it clear where and why the Workgroup chairman has exercised their right under the Grid Code to progress a Workgroup Consultation Alternative Request or a WAGCM proposal against the majority views of Workgroup members. It should also be explicitly stated where, under these circumstances, the Workgroup chairman is employed by the same organisation who submitted the Workgroup Consultation Alternative Request.

13. The Workgroup is to submit its final report to the Modifications Panel Secretary for circulation to Panel Members. The final report conclusions will be presented to the Grid Code Review Panel meeting at a Special Grid Code Review Panel meeting in mid September 2019.

Membership

It is recommended that the Workgroup has the following members:

Role	Name	Representing (User nominated)
Chair	Paul Mullen	Code Administrator
Technical Secretary	Chrissie Brown	Code Administrator
Proposer / Workgroup Member*	Tony Johnson	National Grid ESO
Workgroup Member*	Garth Graham	SSE Generation Ltd.
Workgroup Member*	Alastair Frew	Drax Generation Enterprise Ltd
Workgroup Member*	Grant McBeath	SP Energy Networks
Workgroup Member*	Paul Crolla	ScottishPower Renewables
Workgroup Member*	Richard Wilson	UK Power Networks

14. A (*) Workgroup must comprise at least 5 members (who may be Panel Members). The roles identified with an asterisk (*) in the table above contribute toward the required quorum, determined in accordance with paragraph 15 below.

15. The Grid Code Review Panel must agree a number that will be quorum for each Workgroup meeting. The agreed figure for GC0127 is that at least 5 Workgroup members must participate in a meeting for quorum to be met.

16. A vote is to take place by all eligible Workgroup members on the Modification Proposal and each WAGCM proposal and Workgroup Consultation Alternative Request based on their assessment of the Proposal(s) against the Grid Code objectives when compared against the current Grid Code baseline.

    - Do you support the Original or any of the alternative Proposals?
    - Which of the Proposals best facilitates the Grid Code Objectives?

    The Workgroup chairman shall not have a vote, casting or otherwise. The results from the vote and the reasons for such voting shall be recorded in the Workgroup report in as much detail as practicable.

17. It is expected that Workgroup members would only abstain from voting under limited circumstances, for example where a member feels that a proposal has been insufficiently developed. Where a member has such concerns, they should raise these with the Workgroup chairman at the earliest possible opportunity and certainly before the Workgroup vote takes place. Where abstention occurs, the reason should be recorded in the Workgroup report.

18. Workgroup members or their appointed alternate are required to attend a minimum of 50% of the Workgroup meetings to be eligible to participate in the Workgroup vote.

19. The Technical Secretary shall keep an Attendance Record for the Workgroup meetings and circulate the Attendance Record with the Action Notes after each meeting. This will be attached to the final Workgroup report.

20. The Workgroup membership can be amended from time to time by the Grid Code Review Panel and the Chairman of the Workgroup.

Appendix 1 – Indicative Workgroup Timetable

Please see the latest agreed timetable at the front of the modification report.

Workgroup Terms of Reference and Membership

TERMS OF REFERENCE FOR GC0128 WORKGROUP

GC0128 – EU Code Emergency & Restoration: Requirements resulting from System Restoration Plan

Responsibilities

1. The Workgroup is responsible for assisting the Grid Code Review Panel in the evaluation of Grid Code Modification Proposal **GC0128 – EU Code Emergency & Restoration: Requirements resulting from System Restoration Plan** proposed by Rachel Woodbridge Stocks of National Grid Electricity System Operator in April 2019 and presented to the Grid Code Review Panel on 25 April 2019.

2. The proposal must be evaluated to consider whether it better facilitates achievement of the Grid Code Objectives. These can be summarised as follows:

   (i) *To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity;*

   (ii) *To facilitate 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);*

   (iii) *Subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution systems in the national; and*

   (iv) *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. In conducting its business, the Workgroup will at all times endeavour to operate in a manner that is consistent with the Code Administration Code of Practice principles.*

   (v) *To promote efficiency in the implementation and administration of the Grid Code arrangements.*

Scope

3. The Workgroup must consider the issues raised by the Modification Proposal and consider if the proposal identified better facilitates achievement of the Grid Code Objectives.

4. In addition to the overriding requirement of point 3 above, the Workgroup shall consider and report on the following specific issues:
   a) *Implementation and costs;*

b) Review draft legal text should it have been provided. If legal text is not submitted within the Grid Code Modification Proposal the Workgroup should be instructed to assist in the developing of the legal text; and

c) Consider whether any further Industry experts or stakeholders should be invited to participate within the Workgroup to ensure that all potentially affected stakeholders have the opportunity to be represented in the Workgroup. Demonstrate what has been done to cover this clearly in the report

d) Confirm when GC0128 requirements would apply to Users

e) Are there any cross-code impacts?

f) Consider the impacts on Grid Code Users

g) Consider the impact of embedded generation as part of a black start restoration plan

h) who can be a frequency leader, and under what circumstances

5. As per Grid Code GR20.8 (a) and (b) the Workgroup should seek clarification and guidance from the Grid Code Review Panel when appropriate and required.

6. The Workgroup is responsible for the formulation and evaluation of any Workgroup Alternative Grid Code Modifications arising from Group discussions which would, as compared with the Modification Proposal or the current version of the Grid Code, better facilitate achieving the Grid Code Objectives in relation to the issue or defect identified.

7. The Workgroup should become conversant with the definition of Workgroup Alternative Grid Code Modification which appears in the Governance Rules of the Grid Code. The definition entitles the Group and/or an individual member of the Workgroup to put forward a Workgroup Alternative Code Modification proposal if the member(s) genuinely believes the alternative proposal compared with the Modification Proposal or the current version of the Grid Code better facilitates the Grid Code objectives The extent of the support for the Modification Proposal or any Workgroup Alternative Modification (WAGCM) proposal WAGCM arising from the Workgroup's discussions should be clearly described in the final Workgroup Report to the Grid Code Review Panel.

8. Workgroup members should be mindful of efficiency and propose the fewest number of WACM proposals as possible. All new alternative proposals need to be proposed using the Alternative Request Proposal form ensuring a reliable source of information for the Workgroup, Panel, Industry participants and the Authority.

9. All WAGCM proposals should include the Proposer(s)'s details within the final Workgroup report, for the avoidance of doubt this includes WACM proposals which are proposed by the entire Workgroup or subset of members.

10. There is an option for the Workgroup to undertake a period of Consultation in accordance with Grid Code GR. 20.11, if defined within the timetable agreed by the Grid Code Panel. Should the Workgroup determine that they see the benefit in a Workgroup Consultation being issued they can recommend this to the Grid Code Review Panel to consider.

11. Following the Consultation period the Workgroup is required to consider all responses including any Workgroup Consultation Alternative Requests. In undertaking an assessment of any Workgroup Consultation Alternative Request, the Workgroup should consider whether it better facilitates the Grid Code Objectives than the current version of the Grid Code.

12. As appropriate, the Workgroup will be required to undertake any further analysis and update the appropriate sections of the original Modification Proposal and/or WAGCM proposals (Workgroup members cannot amend the original text submitted by the Proposer of the modification) All responses including any Workgroup Consultation Alternative Requests shall be included within the final report including a summary of the Workgroup's deliberations and conclusions. The report should make it clear where and why the Workgroup chairman has exercised their right under the Grid Code to progress a Workgroup Consultation Alternative Request or a WAGCM proposal against the majority views of Workgroup members. It should also be explicitly stated where, under these circumstances, the Workgroup chairman is employed by the same organisation who submitted the Workgroup Consultation Alternative Request.

13. The Workgroup is to submit its final report to the Modifications Panel Secretary for circulation to Panel Members. The final report conclusions will be presented to the Grid Code Review Panel meeting to the Grid Code Review Panel in mid-September.

Membership

It is recommended that the Workgroup has the following members:

Role	Name	Representing (User nominated)
Chair	Paul Mullen	Code Administrator
Technical Secretary	Chrissie Brown	Code Administrator
Proposer / Workgroup Member*	Tony Johnson	National Grid ESO
Workgroup Member*	Garth Graham	SSE Generation Ltd.
Workgroup Member*	Alastair Frew	Drax Generation Enterprise Ltd
Workgroup Member*	Grant McBeath	SP Energy Networks
Workgroup Member*	Paul Crolla	ScottishPower Renewables
Workgroup Member*	Richard Wilson	UK Power Networks

14. A (*) Workgroup must comprise at least 5 members (who may be Panel Members). The roles identified with an asterisk (*) in the table above contribute toward the required quorum, determined in accordance with paragraph 15 below.

15. The Grid Code Review Panel must agree a number that will be quorum for each Workgroup meeting. The agreed figure for GC0128 is that at least 5 Workgroup members must participate in a meeting for quorum to be met.

16. A vote is to take place by all eligible Workgroup members on the Modification Proposal and each WAGCM proposal and Workgroup Consultation Alternative Request based on their assessment of the Proposal(s) against the Grid Code objectives when compared against the current Grid Code baseline.

- Do you support the Original or any of the alternative Proposals?

- Which of the Proposals best facilitates the Grid Code Objectives?

The Workgroup chairman shall not have a vote, casting or otherwise. The results from the vote and the reasons for such voting shall be recorded in the Workgroup report in as much detail as practicable.

17. It is expected that Workgroup members would only abstain from voting under limited circumstances, for example where a member feels that a proposal has been insufficiently developed. Where a member has such concerns, they should raise these with the Workgroup chairman at the earliest possible opportunity and certainly before the Workgroup vote takes place. Where abstention occurs, the reason should be recorded in the Workgroup report.

18. Workgroup members or their appointed alternate are required to attend a minimum of 50% of the Workgroup meetings to be eligible to participate in the Workgroup vote.

19. The Technical Secretary shall keep an Attendance Record for the Workgroup meetings and circulate the Attendance Record with the Action Notes after each meeting. This will be attached to the final Workgroup report.

20. The Workgroup membership can be amended from time to time by the Grid Code Review Panel and the Chairman of the Workgroup.

Appendix 1 – Indicative Workgroup Timetable

Please see the latest timetable approved by the Panel on the front of the modification report.

GC0127 / GC0128

LEGAL TEXT – DATED 19 JULY 2019

Extracts from GC0096 (Storage) are included in Blue Text

Extracts from G&D's

Electricity Storage	The conversion of electrical energy into a form of energy which can be stored, the storing of that energy, and the subsequent reconversion of that energy back into electrical energy.
Electricity Storage Module	Is either one or more **Synchronous Electricity Storage Unit**(s) or **Non-Synchronous Electricity Storage Unit**(s) which could also be part of a **Power Generating Module**. For the avoidance of doubt, **Non-Controllable Electricity Storage Equipment** would not be considered to be classed as an **Electricity Storage Module** or as an **Electricity Storage Unit**.
Non-Synchronous Electricity Storage Module	A **Power Park Module** comprising soley of one or more **Non-Synchronous Electricity Storage Units**.
Synchronous Electricity Storage Module	A **Synchronous Power Generating Module** which can convert or re-convert electrical energy from another source of energy such that the frequency of the generated voltage, the rotor speed and the frequency of network voltage are in a constant ratio and thus in synchronism. For the avoidance of doubt a **Synchronous Electricity Storage Module** could comprise of one or more **Synchronous Electricity Storage Units**.
Synchronous Electricity Storage Unit	A **Synchronous Generating Unit** which can supply or absorb electrical energy such that the frequency of the generated voltage, the rotor speed and the frequency of the equipment are in constant ratio and thus in synchronism with the network.

Extracts from CC's

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CC.6.5.4.4 Where **Control Telephony** or **System Telephony** is installed, routine testing of such facilities may be required by **The Company** (not normally more than once in any calendar month). The **GB Code User** and **The Company** shall use reasonable endeavours to agree a test programme and where **The Company** requests the assistance of the **User** in performing the agreed test programme the **User** shall provide such assistance. –**The Company** requires the **GB Code User** to test the backup power supplies feeding its **Control Telephony** facilities at least once every 5 years.

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CC.A.5.4 Low Frequency Relay Testing

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

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

CC.A.5.4.2 Each **Non-Embedded Customer** shall execute a low frequency demand disconnection test at least once every three years.

CC.A.5.4.3 Each **Network Operator** shall execute testing on its low frequency demand disconnection relays installed within its network at least once every three years.

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Extracts from ECC's

ECC.1 INTRODUCTION

ECC.1.1 The **European Connection Conditions** ("**ECC**") specify both:

(a) the minimum technical, design and operational criteria which must be complied with by:

(i) any **EU Code User** connected to or seeking connection with the **National Electricity Transmission System**, or

(ii) **EU Generators** or **HVDC System Owners** connected to or seeking connection to a **User's System** which is located in **Great Britain** or **Offshore**, or

(iii) **Network Operators** who are **EU Code Users**

(iv) **Network Operators** who are **GB Code Users** but only in respect of:-

(a) Their obligations in respect of **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** for whom the requirements of ECC.3.1(b)(iii) apply alone; and/or

(b) The requirements of this **ECC** only 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 **CC**s.

(v) **Non-Embedded Customers** who are **EU Code Users**

(b) the minimum technical, design and operational criteria with which **The Company** will comply in relation to the part of the **National Electricity Transmission System** at the **Connection Site** with **Users**. In the case of any **OTSDUW Plant and Apparatus**, the **ECC** also specify the minimum technical, design and operational criteria which must be complied with by the **User** when undertaking **OTSDUW**.

(c) The requirements of **European Regulation (EU) 2016/631** shall not apply to

(i) **Power Generating Modules** that are installed to provide backup power and operate in parallel with the **Total System** for less than 5 minutes per calendar month while the **System** is in normal state. Parallel operation during maintenance or commissioning of tests of that **Power Generating Module** shall not count towards that five minute limit.

(ii) **Power Generating Modules** connected to the **Transmission System** or **Network Operators System** which are not operated in synchronism with a **Synchronous Area**.

(iii) **Power Generating Modules** that do not have a permanent **Connection Point** or **User System Entry Point** and used by **The Company** to temporarily provide power when normal **System** capacity is partly or completely unavailable.

(iv) **Electricity Storage Modules**.

(d) **Storage Users** are required to comply with the entirety of the **ECC** but are not subject to the requirements of **European Regulation (EU) 2016/631**, **European Regulation (EU) 2016/1388** and **European Regulation EU 2016/1485**. The requirements of the **ECC** shall therefore be enforceable against **Storage Users** under the Grid Code only (and not under any of the aforementioned **European Regulations**) and any derogation sought by a **Storage User** in respect of the **ECC** shall be deemed a derogation from the Grid Code only (and not from the aforementioned **European Regulations**).

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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.

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ECC.3.6 The requirements of this **ECC** shall apply to **EU Code Users** in respect of **Power Generating Modules** (including **DC Connected Power Park Modules** and **Electricity Storage Modules**) and **HVDC Systems**.

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ECC.6.3 GENERAL POWER GENERATING MODULE, OTSDUW AND HVDC EQUIPMENT REQUIREMENTS

ECC.6.3.1 This section sets out the technical and design criteria and performance requirements for **Power Generating Modules** (which includes **Electricity Storage Modules**) and **HVDC Equipment** (whether directly connected to the **National Electricity Transmission System** or **Embedded**) and (where provided in this section) **OTSDUW Plant and Apparatus** which each **Generator** or **HVDC System Owner** must ensure are complied with in relation to its **Power Generating Modules**, **HVDC Equipment** and **OTSDUW Plant and Apparatus**. References to **Power Generating Modules**), **HVDC Equipment** in this ECC.6.3 should be read accordingly. For the avoidance of doubt, the requirements applicable to **Synchronous Power Generating Modules** also apply to **Synchronous Electricity Storage Modules** and the requirements applicable to **Power Park Modules** apply to **Non-Synchronous Electricity Storage Modules**. In addition, the requirements applicable to **Electricity Storage Modules** also apply irrespective of whether the **Electricity Storage Module** operates in such a mode as to import or export power from the **Total System**.

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ECC.6.3.3 OUTPUT POWER WITH FALLING FREQUENCY

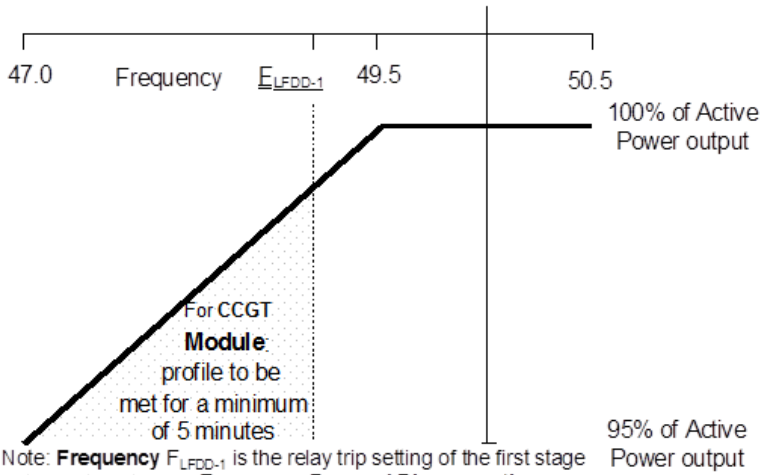
ECC.6.3.3.1 Output power with falling frequency for **Power Generating Modules** and **HVDC Equipment**

ECC.6.3.3.1.1 Each **Power Generating Module** and **HVDC Equipment** must be capable of:

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

(b) (subject to the provisions of ECC.6.1.2) maintaining its **Active Power** output at a level not lower than the figure determined by the linear relationship shown in Figure ECC.6.3.3(a) for **System Frequency** changes within the range 49.5 to 47 Hz for all ambient temperatures up to and including 25^0C, such that if the **System Frequency** drops to 47 Hz the **Active Power** output does not decrease by more than 5%. In the case of a **CCGT Module**, the above requirement shall be retained down to the **Low Frequency Relay** trip setting of 48.8 Hz, which reflects the first stage of the Automatic Low **Frequency Demand Disconnection** scheme notified to **Network Operators** under OC6.6.2. For **System Frequency** below that setting, the existing requirement shall be retained for a minimum period of 5 minutes while **System Frequency** remains below that setting, and special measure(s) that may be required to meet this requirement shall be kept in service during this period. After that 5 minutes period, if **System Frequency** remains below that setting, the special measure(s) must be discontinued if there is a materially increased risk of the **Gas Turbine** tripping. The need for special measure(s) is linked to the inherent **Gas Turbine Active Power** output reduction caused by reduced shaft speed due to falling **System Frequency**. Where the need for special measures is identified in order to maintain output in line with the level identified in Figure ECC.6.3.3(a) these measures should be still continued at ambient temperatures above 25^0C maintaining as much of the **Active Power** achievable within the capability of the plant. For the avoidance of doubt, **Generators** in respect of **Pumped Storage Plant** and **Electricity Storage Modules** shall also be required to satisfy the requirements of OC6.6.6.

Figure ECC.6.3.3(a) **Active Power** Output with falling frequency for **Power Generating Modules** and **HVDC Systems** and **Electricity Storage Modules** when operating in an exporting mode of operation



Note: **Frequency** F_{LFDD-1} is the relay trip setting of the first stage of the Automatic Low **Frequency Demand Disconnection** Scheme

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ECC.6.5.4.4 Where **Control Telephony** or **System Telephony** is installed, routine testing of such facilities may be required by **The Company** (not normally more than once in any calendar month). The **User** and **The Company** shall use reasonable endeavours to agree a test programme and where **The Company** requests the assistance of the **User** in performing the agreed test programme the **User** shall provide such assistance. **The Company** requires the **EU Code User** to test the backup power supplies feeding its **Control Telephony** facilities at least once every 5 years.

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Extracts from Demand Response Services Code (DRSC))

DRSC.1 INTRODUCTION

DRSC.1.1 The **Demand Response Services Code** is concerned with **Demand Response Providers** who contract with **The Company** for the provision of **Ancillary Services**.

DRSC.1.2 **Ancillary Services** are non-mandatory services used by **The Company** in operating the **System**. They are provided by **Demand Response Providers** with payment being dealt with under the terms of the relevant agreement for the **Ancillary Service**.

DRSC.1.3 Where a **Demand Response Provider** is interested in offering an **Ancillary Service** to **The Company**, then further details and additional information of the **Ancillary Services** are available from the Balancing Services section of the **Website**.

DRSC.1.4 Where **The Company** and a **Demand Response Provider** enter into an **Ancillary Services** agreement, it shall be in accordance with **Transmission Licence** condition C16 and the **Standard Contract Terms**.

DRSC 1.5 **The Demand Response Services Code** which would form part of an **Ancillary Services** agreement between a **Demand Response Provider** and **The Company** nd to discharge the obligations under **European Regulation (EU) 2016/1388**. The **Ancillary Services** agreement will include an obligation on the **Demand Response Provider** to satisfy the applicable requirements of this **Demand Response Services Code**.

DRSC.1.6 The **Demand Response Code** applies only to **Demand Response Providers** who have entered into an agreement with **The Company** to provide an **Ancillary Service**. This **Demand Response Services Code** does not apply to **Users** who are not **Demand Response Providers**.

DRSC.1.7 For the avoidance of doubt, **Network Operators** and **Non Embedded Customers** in respect of **EU Grid Supply Points** are required to satisfy the compliance requirements in section DRSC.11 of this code in addition to the **European Compliance Processes** only if they are also a **Demand Response Provider** ~~unless they are also a **Demand Response Provider**~~.

DRSC.2 OBJECTIVE

The objectives of the **DRSC** are to

DRSC.2.1 Ensure the obligations of **European Regulation (EU) 2016/1388** have been discharged; and

DRSC.2.2 Complement the requirements of the **Ancillary Services** agreement between **The Company** and a **Demand Response Provider**; and

DRSC.2.3 Define the minimum technical and compliance requirements **Demand Response Providers** are required to satisfy if they provide a **Demand Response Service** to **The Company** under an **Ancillary Services** agreement.

DRSC.3 SCOPE

DRSC.3.1 The **DRSC** applies to any **Demand Response Provider** who has entered into an agreement to provide **Ancillary Services** with **The Company**.

DRSC.3.2 The **DRSC** does not apply to **Users**, **BM Participants** or other parties ~~who are not~~ unless they are also a **Demand Response Provider**~~s~~.

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DRSC.11.7 Additional Testing requirements for Network Operators, Non-Embedded Customers and BM Participants who are also Demand Response Providers

DRSC.11.7.1 **Network Operators**, **Non-Embedded Customers** and **BM Participants** who are also **Demand Response Providers** shall be required to execute a demand modification test after two consecutive unsuccessful responses in the operational environment or at least every year as agreed with **The Company**.

DRSC.11.7.2 Each **Network Operator**, **Non-Embedded Customer** and **BM Participant** who are also **Demand Response Providers** and provide demand response low frequency demand disconnection shall execute a low frequency demand disconnection test at least once every three years.

Extracts from European Compliance Processes (ECPs)

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ECP.A.8.9 Testing of Low Frequency Demand Disconnection schemes

ECP.A.8.9.1 Each **Non-Embedded Customer** shall execute a low frequency demand disconnection test at least once every three years.

ECP.A.8.9.2 Each **Network Operator** shall execute testing on its low frequency demand disconnection relays installed within its network at least once every three years.

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Extracts from OC5

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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. Any test conducted shall not place the **User's Plant** and **Apparatus** at risk or endanger the operational security of the **National Electricity Transmission System**. In addition, the test shall be conducted in a way which minimises the impact on other **Users** of the **National Electricity Transmission System**.

OC5.5.4 Test 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 G5/4.
	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.6.2.2.2.2(a), CC.6.2.3.1.1(a), ECC.6.2.2.2.2(a), ECC.6.2.3.1.1(a), **Bilateral Agreement**
	Back Up Protection	CC.6.2.2.2.2(b), CC.6.2.3.1.1(b), ECC.6.2.2.2.2(a), ECC.6.2.3.1.1(a), **Bilateral Agreement**
	Circuit Breaker Fail **Protection**	CC.6.2.2.2.2(c), CC.6.2.3.1.1(c), ECC.6.2.2.2.2(c), ECC.6.2.3.1.1(c)

Parameter to be Tested		Criteria against which the test results will be assessed by The Company.
	Reactive Capability	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**. 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 ±5% of the reactive capability registered with **The Company** under **OC2**. the duration of the test will be for a period of upto 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 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. Measurements of the **Reactive Power** output under steady state conditions should be consistent with Grid Code requirements i.e. fully available within the voltage range ±5% at 400kV, 275kV and 132kV and lower voltages.
Governor / Frequency Control	Primary Secondary and High **Frequency** Response	**Ancillary Services Agreement**, CC.6.3.7 and where applicable CC.A.3 or ECC.6.3.7 and where applicable ECC.A.3. For a test initiated under OC.5.5.1.1 the measured response in MW/Hz is within ±5% of the level of response specified in the **Ancillary Services Agreement** for that **Genset**.
	Stability with Voltage	CC.6.3.4 or ECC.6.3.4

Parameter to be Tested		Criteria against which the test results will be assessed by The Company.
	Governor / Load / **Frequency** Controller **System** Compliance	CC.6.3.6(a), CC.6.3.7, CC.6.3.9, CC8.1, 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 ±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 25ºC., BC3.5.1
	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**, **QPN**, **Joint BM Unit Data** and **Dynamic Parameters**	BC2 The **Export and Import Limits**, **QPN**, **Joint BM Unit Data** and **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**.

Parameter to be Tested		Criteria against which the test results will be assessed by The Company.
	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**, **Network Operators** 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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OC5.7 BLACK START TESTING

OC5.7.1 General

(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**. This could where agreed include the requirement for a **Generator** to demonstrate that its **Generating Units**, **Power Park Modules** or **Power Generating Modules** within a **Black Start Station**, are capable of delivering a quick re-sycnhronisation service through executing a trip to house load test. Such a test would be assessed against the requirements of the **Black Start Contract** and/or the requirements of ECC.6.3.5.6. The quick re-synchronisation test would generally only be required where the **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.

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Extracts from OC6

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OC6.6.2 (d) Each **Network Operator** will notify **The Company** in writing by calendar week 24 each year of the details of the automatic low **Frequency Disconnection** on its **User System**. The information provided should identify, for each **Grid Supply Point** at the date and time of the annual peak of the **National Electricity Transmission System Demand** at **Annual ACS Conditions** (as notified pursuant to OC1.4.2), the frequency settings at which **Demand Disconnection** will be initiated and amount of **Demand** and **Netted Demand** disconnected at each such setting.

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OC6.6.6 (a) **Non-Embedded Customers**, ~~and~~ **Generators** in respect of **Electricity Storage Modules** and **Pumped Storage Generators** must provide automatic low **Frequency** disconnection, which will be split into discrete blocks.

(b) The number and size of blocks and the associated low **Frequency** settings will be as specified by **The Company** by week 24 each calendar year following discussion with the **Non-Embedded Customers**, **Pumped Storage Generators** and **Generators** in respect of **Electricity Storage Modules** in accordance with the relevant **Bilateral Agreement**.

Commented [J(A1]: Note - this text also needs changing in respect of GC0096

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Extracts from OC9

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OC.9.2. OBJECTIVE

The overall objectives of OC9 are:…….

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**

(ii) Expand **Power Islands** to supply **Power Stations**

(iii) Expand and merge **Power Islands** leading to **Total System** energisation

(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**.

(vii) Information supply relating to issues such as, but not limited to

(a) The status of **Plant** and **Apparatus**

(b) Operational limits

(c) **Power Station** outputs

(d) Time critical processes

(e) The state of the **National Electricity Transmission System**

(f) Status information (as necessary) such as **Active Power** output, **Reactive Power** Output, **Block Load Capability**, tap and circuit breaker positions,

~~(a)~~(g) **Emdedded Power Station** data where such data is not visible to the **Network Operator**

(viii) Instructions to **User's** including **Generators**, **HVDC System Owners**, **DC Converter Station Owners**, **Interconnectors**, **Network Operators** and **Non-Embedded Customers**.

Annex 2 – Mapping for Emergency & Restoration Networks Code

This has been uploaded separately to the modification area for GC0127 and GC0128

Annex 3 – Attendance log

Key

A – Attended

X – Absent

O – Alternate

D – Dial-in

Name	Organisation	Role	29/05/2019	13/06/2019	02/07/2019	03//2019	19/07/019
Paul Mullen	Code Administrator, NG Electricity System Operator	Chair	A	A	A	A	X
Chrissie Brown	Code Administrator, NG Electricity System Operator	Technical Secretary	A	A	A	A	A
Antony Johnson	National Grid Electricity System Operator	Proposer/Workgroup member	A	A	A	A	A
Mark Jones	National Grid Electricity System Operator	Subject matter expert	A	A	A	A	D

Alastair Frew	Drax Generation Enterprise Ltd	Workgroup member	A	D	A	A	D
Garth Graham	SSE Generation Limited	Workgroup member	A	D	D	A	D
Andy Colley	SSE Generation Limited	Alternate Workgroup member	X	D Part meeting	X	A	X
Paul Crolla	Scottish Power Renewables	Workgroup member	A	A	A	A	D
Grant McBeath	SP Energy Networks	Workgroup member	X	X	X	X	D
Graeme Vincent	SP Energy Networks	Alternate Workgroup member	D	A	A	A	X
Richard Wilson		Workgroup member	X	X	A	X	X

Annex 4 – Draft legal text

Workgroup Consultation	At what stage is this document in the process?

GC0127 & GC0128:

Mod Title: EU Code Emergency & Restoration: Requirements resulting from System Defence and Restoration Plans

01	Proposal form
02	Workgroup Consultation
03	Workgroup Report
04	Code Administrator Consultation
05	Draft Grid Code Modification Report
06	Final Grid Code Modification Report

Purpose of Modification: This modification seeks to align the GB Grid Code with the European Emergency and Restoration code, specifically in relation to requirements on Grid Code parties set out in the System Defence Plan and System Restoration Plan that need to be implemented by 18 December 2019.

This document contains the discussion of the Workgroup which formed in May 2019 to develop and assess the proposal. Any interested party is able to make a response in line with the guidance set out in the Governance Rules of the Grid Code.

Published on: 19 July 2019

Length of Consultation: 20 Working days

Responses by: 16 August 2019

High Impact:

GC0127: Electricity System Operator (ESO), Transmission Owners, Generators who have signed a CUSC Contract, HVDC System Owners who have signed a CUSC Contract, DC Converter Station Owners who have signed a CUSC Contract, Network Operators, Non-Embedded Customers and BM Participants (who are also Aggregators and Demand Response Providers)

GC0128: Electricity System Operator (ESO), Transmission Owners, Generators who have signed a CUSC Contract, HVDC System Owners who have signed a CUSC Contract, DC Converter Station Owners who have signed a CUSC Contract, Network Operators, Non-Embedded Customers, Providers of Black Start Services and BM Parties (who are also Aggregators and Demand Response Providers)

Contents

Timetable

The Code Administrator recommends the following timetable:	
Presented to Panel	25 April 2019
Initial consideration by Workgroup	May 2019
Workgroup Report presented to Panel	September 2019
Code Administration Consultation Report issued to the Industry	September 2019
Draft Final Modification Report presented to Panel	26 September 2019
Modification Panel decision	26 September 2019
Final Modification Report issued to the Authority	11 October 2019
Expected Authority Decision	29 November 2019
Decision implemented in Grid Code	17 December 2019

Any questions?

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1 About this document

This Workgroup Consultation contains the discussion of the Workgroup which formed in May 2019 to develop and assess the proposals. This Consultation document covers both modification GC0127 and GC0128.

Section 2 (Original Proposal) and **Section 3 (Proposer's solution**) are sourced directly from the Proposer and any statements or assertions have not been altered or substantiated/supported or refuted by the Workgroup. Section 5 of the Workgroup contains the discussion by the Workgroup on the Proposal and the potential solution.

The Grid Code Panel detailed in the Terms of Reference the scope of work for the GC0127 and GC0128 Workgroup and the specific areas that the Workgroup should consider.

The table below details these specific areas and where the Workgroup have covered them or will cover them post Workgroup Consultation.

The full Terms of Reference can be found in Annex 1.

Terms of Reference GC0127

Specific Area	Location in the report
Implementation and costs;	Section 2, 3 and 5
Review draft legal text should it have been provided. If legal text is not submitted within the Grid Code Modification Proposal the Workgroup should be instructed to assist in the developing of the legal text;	Annex 4
Consider whether any further Industry experts or stakeholders should be invited to participate within the Workgroup to ensure that all potentially affected stakeholders have the opportunity to be represented in the Workgroup. Demonstrate what has been done to cover this clearly in the report;	Section 5
Confirm when GC0127 requirements would apply to Users	Section 2, 3 & 5
Are there any cross-code impacts?	Section 2, 3 & 5
Consider the impacts on Grid Code Users • whether all types of storage are affected or those classified as SGU's • the load disconnection, frequencies and profiles being used	Section 2, 3 & 5

• how to maintain the commercial services that are currently provided • Seek a view from the NGESO in regards to the impact on system inertia	
Consider how balancing services will be obtained from Users that do not currently provide them	Section 2, 3 & 5

Terms of Reference GC0128

Specific Area	Location in the report
Implementation and costs;	Section 2, 3 & 5
Review draft legal text should it have been provided. If legal text is not submitted within the Grid Code Modification Proposal the Workgroup should be instructed to assist in the developing of the legal text;	Annex 4
Consider whether any further Industry experts or stakeholders should be invited to participate within the Workgroup to ensure that all potentially affected stakeholders have the opportunity to be represented in the Workgroup. Demonstrate what has been done to cover this clearly in the report;	Section 5
Confirm when GC0128 requirements would apply to Users	Section 2, 3 & 5
Are there any cross-code impacts?	Section 2, 3 & 5
Consider the impacts on Grid Code Users	Section 2, 3 & 5
Consider the impact of embedded generation as part of a black start restoration plan	Section 2, 3 & 5
who can be a frequency leader, and under what circumstances	Section 2, 3 & 5

Acronym Table

Acronym	Meaning
E&R NC	Emergency and Restoration Network Code[1]
DCC	Demand Connection Code
HVDC	High Voltage Direct Current
NGESO	National Grid Electricity System Operator
SRP	System Restoration Plan
SDP	System Defence Plan
SGU	Significant Grid User
RfG	Requirements for Generators European Code
SOGL	Electricity Transmission System Operation Guideline 2017/1485
BM	Balancing Mechanism

2 Original Proposal

Section 2 (Original Proposal) and Section 3 (Proposer's solution) are sourced directly from the Proposer and any statements or assertions have not been altered or substantiated/supported or refuted by the Workgroup. Section 5 of the

[1] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R2196&from=EN

Workgroup Consultation contains the discussion by the Workgroup on the Proposal and the potential solution.

Defect

The Emergency and Restoration Code (E&R) requires the Electricity System Operator to create a System Defence Plan (SDP) and System Restoration Plan (SRP), which National Grid ESO produced and consulted on in September 2018. There are also requirements on energy storage units and SGUs in the SDP and SGU's in the SRP that are not currently in the Grid Code, and so the two need to be aligned for transparency.

The SDP and SRP need to be implemented by 18 December 2019 so these modifications will need to be in the Grid Code by the same date.

What

This modification proposes to align E&R, the SDP, the SRP and the Grid Code.

Why

This modification needs to progress to ensure the sections of the SDP and SRP that need to be implemented by 18 December 2019 meet those timescales.

These Proposals are two of a number of Proposals which seek to implement relevant provisions of a number of new EU Network Codes/Guidelines which have been introduced in order to enable progress towards a competitive and efficient internal market in electricity. The full set of EU network guidelines and codes are;

- Regulation 2015/1222- Capacity Allocation and Congestion Management (CACM) which entered into force 14 August 2015;
- Regulation 2016/1719 – Forward Capacity Allocation (FCA) which entered into force 17 October 2016;
- Regulation 2016/631- Requirements for Generators (RfG) which entered into force 17 May 2016;
- Regulation 2016/1388 – Demand Connection Code (DCC) which entered into force 7 September 2016;
- Regulation 2016/1447 – High Voltage Direct Current (HVDC) which entered into force 28 September 2016;
- Transmission System Operation Guideline (SOGL) - which entered into force 14 September 2017; and
- Regulation 2017/2196 - Emergency and Restoration (E&R) which entered into force 18 December 2017.

The Regulation establishing a Network Code on Emergency and Restoration entered into force on 18 December 2017. The Emergency and Restoration Network Code sets out rules relating to the management of the electricity transmission system in the emergency, blackout and restoration states. The main objective of the relevant rules is to bring the system back to the normal state as quickly and efficiently as possible.

How – GC0127

In coordination with Article 15(3) of E&R and section 3.1.5 of the SDP specifies that:

Energy Storage systems taking energy are required to automatically switch to generating mode or where it is not capable of doing this must automatically disconnect before the activation of Low Frequency Demand Disconnection Scheme.

In coordination with Article 21(1b) of E&R, specifies that:

1. In case of absence of control area adequacy in the day-ahead or intraday timeframe, identified pursuant to paragraphs 1 and 2 of Article 107 of Regulation (EU) 2017/1485, and prior to any potential suspension of market activities pursuant to Article 35, a TSO shall be entitled to request assistance for active power from:

(a) any balancing service provider, which, upon the TSO request, shall change its availability status to make available all its active power, provided it was not already activated through the balancing market, and conforming to its technical constraints;

(b) any SGU connected in its LFC area, which does not already provide a balancing service to the TSO, and which, upon the TSO request, shall make available all its active power, conforming to its technical constraints; and

(c) other TSOs that are in the normal or alert state.

This requirement was also reflected in section 4.6.3 of the updated SDP.

How – GC0128

- Frequency management within a Black Start (Articles 27(4))

Frequency management within a Black Start (Articles 27(4))

Article 27 – Activation of the Re-energisation Procedure

Changes to clarify the requirements on Distribution System Operators (Transmission Owners and Distribution Network Operators) to provide demand, expected duration and risk information during a restoration. It is believed that the Grid Code already covers a number of these requirements although minor updates and points of clarification have been added to the legal text where necessary.

Governance

The Proposer recommended that this modification progresses to a Workgroup to fully understand the consequences of these changes for SGUs and storage providers and to ensure that the technical solution is developed to allow minimum disruption for these parties. The Panel agreed with this recommendation.

Technical Skillsets

Appreciation of the SDP, SRP and E&R.

Reference Documents

Emergency and Restoration Code:

Emergency and Restoration consultation documents (including the System Defence Plan and System Restoration Plan):

Please note that these documents are currently being consulted on by National Grid ESO and can be located at the following link;

https://www.nationalgrideso.com/codes/european-network-codes/meetings/emergency-and-restoration-consultation-open

3 Proposers Solution

Section 2 (Original Proposal) and Section 3 (Proposer's solution) are sourced directly from the Proposer and any statements or assertions have not been altered or substantiated/supported or refuted by the Workgroup. Section 5 of the Workgroup Consultation contains the discussion by the Workgroup on the Proposal and the potential solution.

GC0127

System Emergency State

E&R NC Article 13(2)(a)

In addition to the automatically activated schemes of the System Defence Plan, pursuant to point (a) of Article 11(5), each TSO shall activate a procedure of the System Defence Plan when the System is in Emergency State in accordance with the criteria set out in Article 18(3) or Regulation (EU) 2017/1485 and there are no remedial actions available to restore the system to the normal state".

It was noted that as part of System Operator Guideline (SOGL) that this requirement had not been included within Grid Code Working Groups GC0095, GC0106 and GC0114. As such section 2.1.1 of the System Defence Plan[2] has been updated to reflect this requirement.

Clause 2.1.1 of the System Defence Plan states that:

2.1.1 Procedures in this System Defence Plan will be activated when the System is in Emergency state, as defined in SOGL Article 18(3), or operational security analysis requires the activation of a measure. In summary this would occur when:-

- *The reserve capacity in the GB Synchronous Area is reduced by more than 20% for longer than 30 minutes and there is no mechanism to recover the deficit in reserve capacity; or*
- *A situation when Unacceptable Frequency Conditions as defined under the National Electricity Transmission System Security and Quality of Supply Standard have occurred; or*
- *At least one secured event as defined in the SQSS leads to a violation of the security limits even with remedial actions.*

[2] The version as issued for consultation by NGESO on 10th July 2019 at:

https://www.nationalgrideso.com/codes/european-network-codes/meetings/emergency-and-restoration-consultation-open

Storage providers

E&R NC Article 15(3) states that:

Prior to the activation of the automatic low frequency demand disconnection scheme, each TSO and DSO identified pursuant to Article 11(4) shall foresee that energy storage units acting as load connected to its system:

(a) automatically switch to generation mode within the time limit and at an active power set-point established by the TSO in the system defence plan; or

(b) when the energy storage unit is not capable of switching within the time limit established by the TSO in the system defence plan, automatically disconnect the energy storage unit acting as load.

This issue was discussed at the Workgroup and SDP clause 3.1.5 has now been updated to reflect these discussions.

Under the requirements that are proposed to be introduced through GC0096 (Storage), where Electricity Storage Modules would be treated as being owned by Generators (i.e. a Storage would be treated as a subset of Generation) then in respect of Electricity Storage Modules which are charging, they are required to automatically disconnect in accordance with the requirements of OC6 of the Grid Code before the activation of the Low Frequency Demand Disconnection Scheme. Article 15(3) and Article 15(4) of E&R NC places requirements on energy storage units acting as a load to automatically switch to generation mode during periods of low System Frequency. This action would need to take place between 49.5Hz (the threshold associated with LFSM-U) and 48.8Hz (the threshold associated with the first stage of LFDD). NGESO does not consider the action of automatic switching storage units from load to generation appropriate until further study work has been completed, due to the risk of any unintended consequences, the variable droop rates and the differences in performance between storage technologies. Under the proposed System Defence Plan, NGESO define the cycle time from import to export to be set to a very low value (eg 1µs) so the default option will be for the storage plant to trip under low frequency. The settings will be specified on a case by case basis through the Bilateral Agreement and would be within the range of 49.5Hz – 48.8Hz. This approach would be consistent with that suggested for Storage under the GC0096 proposals, the proposals of the (EU) Grid Connection Stakeholder Committee's Storage Expert Group and the approach adopted for Pumped Storage.

The Proposer does however note two observations. Firstly, the Connection Network Codes (RfG, HVDC and DCC) explicitly exclude storage. Secondly, as a separate GB Modification (outside of the EU Codes) a Workgroup has been established to investigate how the Storage technologies should be treated under the auspices of the GB Grid Code. This modification (GC0096) is nearing its conclusion and expected to be approved into the Grid Code at some time over the Summer/Autumn of 2019. In preparation of the additional text, many of the terms developed as part of the GC0096 proposal have been used as part of this modification. As there is significant overlap between the GC0127 proposals and GC0096 proposals, and noting that GC0096 is still

to be approved, the legal text that is relevant to the GC0127 modification (which has been taken from the GC0096 proposals) has been highlighted in blue text.

It is however important to note that E&R NC defines requirements for storage plant to be capable of switching from an importing mode to an exporting mode during periods of low frequency. This issue has not been addressed as part of the GC0096 Workgroup, although as part of this GC0127 modification initial consideration was given to this approach. The initial view of the Proposer was that a capability could be proposed as shown in Figure 1.0 below, however this was soon discounted on the basis of the variation in storage technologies, variable droop rates and unintended system consequences, whilst also noting that similar requirements do not apply to Pumped Storage or HVDC technologies. In addition, a separate (EU) Grid Connection Stakeholder Committee Expert Group was established in the autumn of 2018 to consider how the EU Connection Network Codes could be updated to consider the requirements for Storage. The requirements of Article 15(3) of (EU) Grid Connection Stakeholder Committee which relate to Storage were discussed as part of this Expert Group (https://docstore.entsoe.eu/Documents/Network%20codes%20documents/GC%20ESC/STORAGE/TOP_4_Report_from_EG_STORAGE.pdf) and the same conclusion was reached.

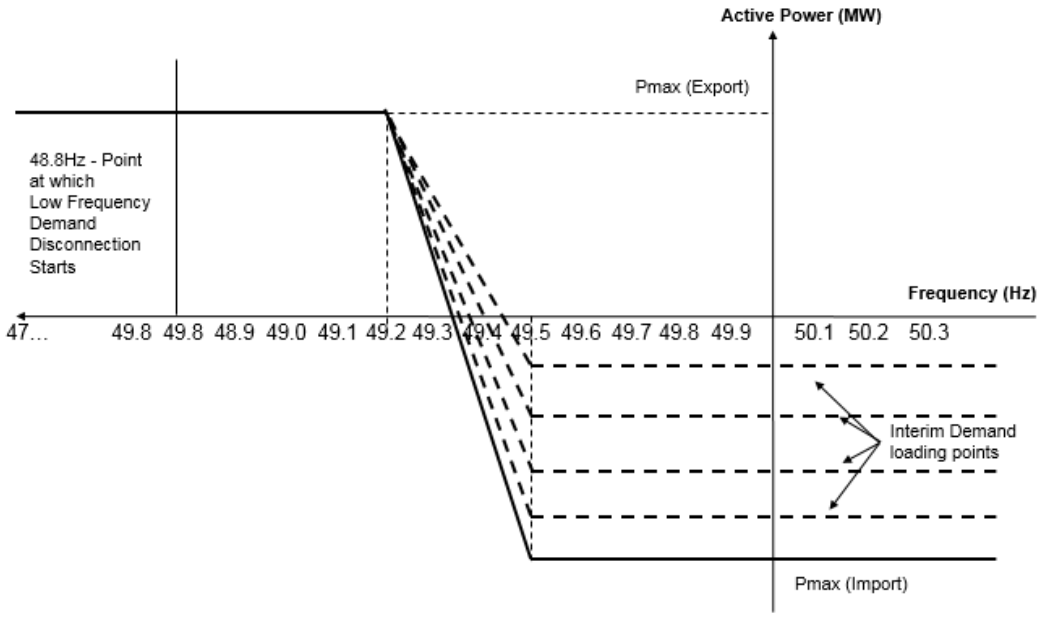

Figure 1.0

As noted above, Article 15(3) E&R NC does state that the TSO shall set the time limit and active power set point for switching from an importing mode of operation to an exporting mode of operation. In GB, by setting the switching time to a short interval (1µs) the default option as defined in Article 15(3)(b) of the E&R NC would be for the automatic disconnection too take place. As GB System Operator, NGESO would not wish all Storage plants to trip at the same time so the specific settings would be included within the Bilateral Agreement which would be consistent with the approach adopted for Pumped Storage.

Active Power Requirements on SGUs

E&R NC Article 21 (1b) states that:

In case of absence of control area adequacy in the day-ahead or intraday timeframe, identified pursuant to paragraphs 1 and 2 of Article 107 of Regulation (EU) 2017/1485, and prior to any potential suspension of market activities pursuant to Article 35, a TSO shall be entitled to request assistance for active power from any SGU connected in its LFC area, which does not already provide a balancing service to the TSO, and which, upon the TSO request, shall make available all its active power, conforming to its technical constraints.

Clause 4.6.3 of SDP has been re-drafted to state:

"Under the NCER, the NGESO shall be entitled to request assistance for active power from SGUs which do not already provide a balancing service. SGU's and Defence Service Providers in GB are defined in Table B1 of Appendix B".

The Proposer has since looked at this in further detail and believes the confusion relates to the definition of an SGU in the E&R NC. In GB, the term SGU is not used and clarity is required in how an SGU is defined within the GB arena. This issue is covered in Section 5 of this report. In considering this issue, the general approach is that an SGU for the purposes of the System Defence Plan would be any GB party who is either a User or a Balancing Mechanism (BM) Participant and therefore bound by the requirements of the Grid Code OC's and BC's. A party who falls outside of this criteria would not be able to be instructed or satisfy the requirements of the System Defence Plan and hence would not be deemed to be a SGU. As such, the Proposer has taken the opportunity to update the System Defence and System Restoration Plan (Appendix B of both documents) so it is clear what an 'SGU', 'Defence Service Provider' and 'Restoration Service Provider' is and how this relates to GB Parties. The intention here is to clearly define which GB Parties would be within the scope of E&R NC.

Compliance Testing for Demand Facilities Providing Demand Side Response (Article 45)

E&R NC states that:

"1. Each defence service provider delivering demand response shall execute a demand modification test, after two consecutive unsuccessful responses in real operation or at least every year, following the methodology laid down in Article 41(1) of Regulation (EU) 2016/1388.

2. Each defence service provider delivering demand response low frequency demand disconnection shall execute a low frequency demand disconnection test within a period to be defined at national level and following the methodology laid down in Article 37(4) of Regulation (EU) 2016/1388 for transmission connected demand facilities or according to a similar methodology defined by the relevant system operator for other demand facilities"

To address this issue, the Demand Response Services Code in the GB Grid Code would be updated, with this Modification, to read:

"DRSC.11.7Additional Testing requirements for Network Operators, Non-Embedded Customers and BM Participants who are also Demand Response Providers

DRSC.11.7.1 ***Network Operators****,* ***Non-Embedded Customers*** *and* ***BM Participants*** *who are also* ***Demand Response Providers*** *shall be required to execute a demand modification test after two consecutive unsuccessful responses in the operational environment or at least every year as agreed with* ***The Company****.*

DRSC.11.7.2 Each ***Network Operator****,* ***Non-Embedded Customer*** *and* ***BM Participant*** *who are also* ***Demand Response Providers*** *and provide demand response low frequency demand disconnection shall execute a low frequency demand disconnection test at least once every three years".*

For GB, the Low Frequency Demand Disconnection test has been set at once every three years to ensure consistency with the frequency of Black Start testing.

In addition where a re-test is required under OC5, the Table in OC5.5.4 would also be updated, with this Modification, to include an entry for Demand Response.

Compliance Testing for Low Frequency Demand Disconnection Relays (Article 47)

E&R NC states that:

"Each DSO and TSO shall execute testing on the low frequency demand disconnection relays implemented on its installations, within a period to be defined at national level and following the methodology laid down in Article 37(6) and Article 39(5) of Regulation (EU) 2016/1388".

To address this issue, the European Compliance Processes in the GB Grid Code would be updated, with this Modification, to read:-

"ECP.A.8.9 Testing of Low Frequency Demand Disconnection schemes

ECP.A.8.9.1 Each ***Non-Embedded Customer*** *shall execute a low frequency demand disconnection test at least once every three years.*

ECP.A.8.9.2 Each ***Network Operator*** *shall execute testing on its low frequency demand disconnection relays installed within its network at least once every three years".*

For existing installations, similar requirements have already been added to CC.A.5.4.2 and CC.A.5.4.3 of the Grid Code.

GC0128

Frequency management within a Black Start (Article 27(4))

The majority of changes are based on the Frequency Management Procedure in the SRP (section 3.3). The main issue here is that in GB NGSO generally takes on the role

as overall co-ordinator of the restoration procedure and is considered to be the 'Frequency Leader'. However, the two Transmission Licensees in Scotland do have a role in frequency management under STCP06-1 (Black Start) and on this basis section 3.2.1, 3.3.1, 3.3.2 and 3.3.4 of the System Restoration Plan has been updated to reflect this.

Information Exchange (Article 40)

Article 40 of E&R NC refers to information being exchanged during a Emergency, Blackout or Restoration State. Although the Grid Code already contains provisions for the sharing of information under a whole range of conditions, including a Blackouts and Emergencies, and whilst not strictly necessary, additional text has been added to OC.9.2.5 for the purposes of clarity.

Quick Re-Synchronisation (Article 44(2))

E&R NC states that:

"2. Each restoration service provider which is a power generating module delivering a quick re-synchronisation service shall execute tripping to houseload test after any changes of equipment having an impact on its houseload operation capability, or after two unsuccessful consecutive tripping in real operation, following the methodology laid down in Article 45(6) of Regulation (EU) 2016/631".

To address this issue OC5.7.1(a) would be updated, with this Modification, to read:

"OC5.7.1 General

*(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**. This could include the requirement for a **Generator** to demonstrate that its **Generating Units**, **Power Park Modules** or **Power Generating Modules** within a **Black Start Station**, is capable of delivering a quick re-sycnhronisation service through executing a trip to house load test. Such a test would be assessed against the requirements of the **Black Start Contract** and/or the requirements of ECC.6.3.5.6. The quick re-synchronisation test would generally only be required where the **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."*

(b)

General Updates applicable to GC0127 and GC0128

As part of the implementation of E&R NC into the GB there are number of elements which are common to both GC0127 and GC0128. In general these refer to requirements such as communication facilities and testing. Whilst the majority of requirements of E&R NC are already generally covered in the Grid Code, a few updates to the Grid Code legal text are proposed to align with the E&R NC. These elements

have been introduced following the mapping process which translates the requirements in the E&R NC into the GB framework.

Operational Security during Testing (Article 43(4))

E&R NC states that:

"Each TSO, DSO, SGU, defence service provider and restoration service provider shall not endanger the operational security of the transmission system and of the interconnected transmission system during the test. The test shall be conducted in a way that minimises the impact on system users".

OC5.5.3.3 of the Grid Code would be updated, with this Modification, to read

*"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. Any test conducted shall not place the **User's Plant** and **Apparatus** at risk or endanger the operational security of the **National Electricity Transmission System**. In addition, the test shall be conducted in a way which minimises the impact on other **Users** of the **National Electricity Transmission System**".*

Backup Power Supplies for Communication Systems (Article 48(2))

E&R NC states that:

"Each DSO and SGU identified pursuant to Article 23(4), each TSO and restoration service provider shall test the backup power supply of their communication systems at least every five years".

To address this issue CC.6.5.4.4 and EC.6.5.4.4 of the Grid Code would be updated, with this Modification. As an example and in the case of ECC.6.5.4.4 the additional text included is replicated below with similar text applying for CC.6.5.4.4.

*"ECC.6.5.4.4 Where **Control Telephony** or **System Telephony** is installed, routine testing of such facilities may be required by **The Company** (not normally more than once in any calendar month). The **User** and **The Company** shall use reasonable endeavours to agree a test programme and where **The Company** requests the assistance of the **User** in performing the agreed test programme the **User** shall provide such assistance. In addition, where **Control Telephony** is installed at an **EU Code User's site**, routine testing of the backup power supplies feeding the **Control Telephony** facilities may be required by **The Company** which shall be at least every 5 years".*

4 Impacts & Other Considerations

Under the proposals for GC0096 (Storage) owners of storage facilities will be treated as if they were Generators. It is therefore suggested that anyone who owns and/or operate storage equipment who are caught by the requirements of the GC0096 proposals would also be affected by this Modification as their equipment would be treated as an SGU. In addition, BM parties (including Aggregators) who are caught by the requirements of the Grid Code, would also be considered to be within the scope of these GC0127 proposals.

GC0128

Black Start Service Providers (a term introduced through the GC0125 proposals) will be affected by this GC0128 modification as will SGUs.

Does this modification impact a Significant Code Review (SCR) or other significant industry change projects, if so, how?

No.

Consumer Impacts

This change will facilitate the implementation of the (EU) Emergency and Restoration Network Code which helps to facilitate a harmonised electricity system as part of the package of European Network Codes, and will help to deliver and facilitate significant benefits to the end consumer by ensuring a coordinated security of supply across GB and Europe.

5 Workgroup discussions

The Workgroup convened on five occasions between May 2019 and July 2019 to discuss the perceived issue, detail the scope of the proposed defect, devise potential solutions and assess the proposal in terms of the Grid Code Objectives. The Workgroup will in due course conclude these tasks after this consultation has taken place (taking account of responses to this consultation).

The Workgroup discussed a number of the key attributes under GC0127 and GC0128, these discussions are described below. The Workgroup for GC0127 and GC0128 met and discussed both Modifications due to having the same membership and similar themes in discussion areas. ***This consultation covers both Modifications to save respondents having to respond to two separate consultation documents with the same themes in many areas. The Code Administrator will request amalgamation of the two Modifications at the July Grid Code Review Panel meeting.***

Significant Grid Users

Some Workgroup members highlighted that it was difficult for them to understand whether they were or were not a 'SGU' by using the criteria outlined in Appendix A and B of the SDP and SRP respectively and that there should have (1) been a list of SGUs produced by NGESO (and submitted to the NRA) for them to check whether they were on it; and (2) been notified by NGESO (or the DSO, if applicable) of the fact that they

meet the criteria and therefore are considered to be a SGU for the purposes of E&R NC in GB.

The Proposer stated that they have updated the System Defence and System Restoration Plan, including Appendix B and the Glossary and Definitions so it is clear in GB what is defined as a Defence Service Provider, Restoration Service Provider and Significant Grid User. Appendix B of both documents has been updated which defines what an SGU in GB is considered to be and the measures required. The Proposer advised that it is not practical to provide a list of individual parties but a criteria clearly articulating who would be within the scope of E&R NC. In addition, NGESO will also be notifying those parties, in the near future[3], that they fall within the scope of E&R NC and therefore that they are an SGU. A Workgroup member noted that TSOs in other Member States had provided such a list, confidentially, to their NRA.

Significant Grid Users within scope of GB

The Proposer confirmed that the following would be deemed to be a SGU in GB;

- *Generators who own and operate new and existing Power Generating Modules (i.e. pre-and post RfG) at Large Power Stations or any Generator who owns and operates new and existing Power Generating Modules at a Power Station which is directly connected to the Transmission System or Generator who has a contract with the ESO.*
- *HVDC System Owners and DC Converter Station Owners who are signatories to the CUSC and required to satisfy the requirements of the Grid Code*
- *New and Existing Non-Embedded Customers (Transmission Connected Demand Facilities)*
- *New and Existing Transmission Connected Closed Distribution Systems*
- *Aggregators registered as BM Participants (i.e. Aggregated Demand Facilities who are BM Participants and would be caught by the requirements of BC1 and BC2 of the Grid Code))*

It was noted that this was not consistent with what had been published and submitted by NGESO to Ofgem in December 2018. The Proposer does however fully recognise that it is not clear what actually constitutes an SGU, especially as this term has derived itself from within the framework of the EU Network Codes rather than existing terminology which has used within GB. However, Workgroup members noted that there must; for the purposes of compliance and assurance; be absolute clarity of who is (and who, therefore, is not) a SGU for the purposes of the TSOs, DSOs and SGUs to ensure GB compliance with E&R NC, as the legal requirements centre around ‘SGUs’.

The Proposer stated to the Workgroup that they are fully committed to clarifying the definition of an SGU, Defence Service Provider and Restoration Service Provider and

[3] NGESO outlined to the Workgroup that they were intending to issue these notifications over the summer of 2019.

therefore substantial updates have been made to Appendix A, Appendix B, and the Glossary and Definitions of the SDP and SRP issued on 10th July 2019 for public consultation.

In general, the approach proposed is that Appendix B of the System Defence and System Restoration Plan defines what and SGU in GB is (i.e. a GBSGU). A Defence Service Provider has the same meaning as a SGU in GB and a Restoration Service Provider is a Black Start Service Provider and / or a GB SGU. In addition, the list in Appendix B now includes the measures that are incumbent on GB SGU's.

An extract from the proposed wording in Appendix B of the SRP and SDP is reproduced in Table 1.0 below to give GB stakeholders this clarity.

The Proposer is currently seeking Legal advice, however in assessing the E&R NC, in particular Articles 2, 4, 11.4(c) and 23.4(c) (which are reproduced at the end of this section) it has come to the above view on the basis that Articles 11.4(c) and Articles 23.4(c) require the System Defence Plan and System Restoration Plan to provide a list of SGU's responsible for implementing on their installations, the measures that result from the mandatory requirements set out in Regulation (EU) 2016/631 (Requirements for Generators), Regulation (EU) 2016/1388 (Demand Connection Code) and Regulation (EU) 2016/1447 (HVDC Code) or from National Legislation and a list of measures to be implemented by those SGU's. The proposer firstly notes i) that the requirements of the EU Connection Network Codes only applies to new parties ii) it also considers that there is some scope for defining the list of SGU's through Articles 11.4(c) and Articles 23.4(c) and iii) there would be significant cost to non CUSC Parties and BM Parties, in particular those who are existing, should the SGU cover all permutations and combinations as defined in Article 2. To this end, the Proposer has tried hard to clearly define (though amendments to the System Defence Plan and System Restoration Plan) what an SGU within GB is and how the criteria within Article 2 of E&R NC relates to those parties.

On the other hand, one workgroup member considers that the definition of an SGU, System Defence Provider and System Restoration Provider within E&R NC is, in their view, much wider than that suggested by the Proposer and is therefore considering an "Alternative" to the Proposers solution along those lines.

Table B1 below (which was prepared by the Proposer) details which GB Parties would, according to NGESO, be within the scope of E&R NC.

EU Criteria	**New or Existing**	**List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)**	**Measures of the System Defence Plan**	**Comments**
Existing and new Power Generating modules classified as Type C and D in accordance with the criteria set out in Article 5 of Commission Regulation (EU) 2016/631	New	Any Generator who is an EU Code User who has a CUSC Contract with the ESO and owns or operates a Type C or Type D Power Generating Module	Applicable Grid Code requirements: PC, ECC, ECP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC In satisfying the above Grid Code requirements, Generators with a CUSC Contract who own or operate a Type C or Type D Power Generating Module would meet one or more of the requirements of the System Defence Plan.	BC 3* applies to Large Power Stations and directly connected Power Stations. The requirements for LFSM-O are covered in ECC.6.3.7.1.
	Existing	Any Generator who is a GB Code User who has a CUSC Contract with the ESO	Applicable Grid Code requirements: PC, CC, CP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC Generators with a CUSC Contract	BC 3* applies to Large Power Stations and directly connected Power Stations. The requirements for LFSM-O are covered in ECC.6.3.7.1.

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
			would need to comply with the applicable requirements of the Grid Code and in doing so would satisfy one or more measures of the System Defence Plan.	
Existing and new power generating modules classified as Type B in accordance with the criteria set out in Article 5 of Regulation (EU) 2016/631, where they are identified as SGU's in accordance with Article 11(4)	New	Any Generator who is a EU Code User and has a CUSC Contract with the ESO and owns or operates a Type B Power Generating Module	Applicable Grid Code requirements: PC, ECC, ECP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC In satisfying the above Grid Code requirements, Generators with a CUSC Contract who own or operate a Power Station comprising a Type B Power Generating Module would meet one or more of the requirements of the System Defence Plan.	As the Generator has a CUSC contract and obliged to satisfy the requirements of the Grid Code, then such parties would be within the scope of NCER. BC 3* applies to Large Power Stations and directly connected Power Stations.
	Existing	Any Generator who is a GB Code User and who has a	Applicable Grid Code requirements: PC, CC, CP, OC1, OC5, OC6, OC7,	As the Generator has a CUSC contract and obliged to satisfy the requirements of the Grid Code, then such parties would be within the scope of NCER.

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
		CUSC Contract with the ESO	OC10, OC12, BC1, BC2, BC3*, DRC In satisfying the above Grid Code requirements, Generators with a CUSC Contract would meet one or more of the requirements of the System Defence Plan.	BC 3* applies to Large Power Stations and directly connected Power Stations.
Existing and new Transmission-connected demand facilities	New	Any Non-Embedded Customer who is an EU Code User and who has a CUSC Contract with the ESO	Applicable Grid Code requirements: PC, ECC, ECP, DRSC*, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC In satisfying the above Grid Code requirements, Non-Embedded Customers would meet one or more of the requirements of the System Defence Plan.	BC 3* and the DRSC* would also apply if the Non-Embedded Customer provided Ancillary Services.
	Existing	Any Non-Embedded Customer who is a	Applicable Grid Code requirements: PC, CC, CP, OC1, OC5, OC6, OC7,	BC 3 would apply if the Non-Embedded Customer provided Ancillary Services.

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
		GB Code User and has a CUSC Contract with the ESO	OC10, OC12, BC1, BC2, BC3*, DRC In satisfying the above Grid Code requirements, Non-Embedded Customers would meet one or more of the requirements of the System Defence Plan.	
Existing and new Transmission Connected Closed Distribution Systems	New	Any Non-Embedded Customer who is an EU Code User and who has a CUSC Contract with the ESO	Applicable Grid Code requirements: PC, ECC, ECP, DRSC*, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC In satisfying the above Grid Code requirements, Non-Embedded Customers would meet one or more of the requirements of the System Defence Plan.	The Closed Distribution System is considered as a Private Network and not registered as a Network Operator or IDNO. The DRSC and BC3 would apply if the Non-Embedded Customer provided Ancillary Services.
	Existing	Any Non-Embedded Customer who is a	Applicable Grid Code requirements: PC, CC, CP, OC1, OC5, OC6, OC7,	The Closed Distribution System is considered as a Private Network and not registered as a Network Operator or IDNO

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
		GB Code User and which has a CUSC Contract with the ESO	OC10, OC12, BC1, BC2, BC3*, DRC In satisfying the above Grid Code requirements, Non-Embedded Customers would meet one or more of the requirements of the System Defence Plan.	
Providers of redispatching of power generating modules or demand facilities by means of aggregation and providers of active power reserve in accordance with Title 8 of Regulation 2017/1485	New & Existing	BM Participants	(ECC/CC 6.5 only) DRSC*, BC1, BC2, BC3*	In general a BM Party will also be a User and in this case they would be caught by the requirements of NCER. Users can fall into different categories and these are detailed above. A BM party who is not defined as a User (such as an Aggregator) will have to satisfy the requirements of BC1 and BC2 and ECC/CC.6.5, and therefore would be considered to meet one or more requirements under the System Defence Plan. A BM Party who also satisfies the requirements of the DRSC (ie they offer Ancillary Services and caught by the requirements of DCC (ie EU Code User's) may also have to satisfy the requirements of BC3 but this would depend on the type of Ancillary Service offered.

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
				In all cases a BM party would be treated as having to meet the requirements of NCER.
Existing and new high voltage direct current (HVDC) Systems and direct current connected Power Park Modules in accordance with the criteria set out in Article 4(1) of commission Regulation (EU) 2016/1447	New	HVDC System Owners and Generators in respect of Transmission DC Converters and/or DC Connected Power Park Modules who are EU Code Users and have a CUSC Contract with the ESO	Applicable Grid Code requirements: PC, ECC, ECP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC In satisfying the above Grid Code requirements, HVDC System Owners and Generators in respect of DC Connected Power Park Modules with a CUSC Contract would meet one or more of the requirements of the System Defence Plan.	BC 3* applies to HVDC System Owners. The requirements for LFSM-O for HVDC Systems and DC Connected Power Park Modules are covered in ECC.6.3.7.1.

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
	Existing	DC Converter Station Owners and Generators in respect of Transmission DC Converters who are GB Code Users and have a CUSC Contract with the ESO	Applicable Grid Code requirements: PC, CC, CP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC In satisfying the above Grid Code requirements, DC Converter Station Owners with a CUSC Contract would meet one or more of the requirements of the System Defence Plan.	BC 3* applies to DC Converter Station Owners

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
Existing and new Type A Power Generating Modules in accordance with the criteria set out in Article 5 of Regulation (EU) 2016/631, to existing and new Type B Power Generating Modules other than those referred to in paragraph 2(b), as well as to existing and new demand facilities, closed distribution systems and third parties providing demand response where they qualify	New	Any Generator who is an EU Code User and has a CUSC Contract with the ESO and owns or operates a Type A Power Generating Module. Non Embedded Customers and BM Participants in respect of Closed Distribution Systems and Aggregators.	Applicable Grid Code requirements: PC, ECC, ECP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC In satisfying the above Grid Code requirements, Generators with a CUSC Contract who own or operate a Power Station comprising a Type A Power Generating Module would meet one or more of the requirements of the System Defence Plan in the same way as a Generator who owns or operates a Type B Power Generating Module	As the Generator has a CUSC contract and obliged to satisfy the requirements of the Grid Code, then such parties would be within the scope of NCER. BC 3* applies to Large Power Stations and directly connected Power Stations. Type A Power Generating Modules are required to satisfy the requirements of ECC.6.3.7.1 (LFSM-O).

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
as defence service providers pursuant to Article 4(4)				

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
Existing and new Type A Power Generating Modules in accordance with the criteria set out in Article 5 of Regulation (EU) 2016/631, to existing and new Type B Power Generating Modules other than those referred to in paragraph 2(b), as well as to existing and new demand facilities, closed distribution systems and third parties providing demand response where they qualify	Existing	Any Generator Registered as a GB Code User which has a CUSC Contract with the ESO and owns or operates a Generating Unit or Power Park Module and is required to satisfy the requirements of the Grid Code Non-Embedded Customers and BM Participants in respect of Closed Distribution Systems and Aggregators.	Applicable Grid Code requirements: PC, CC, CP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC In satisfying the above Grid Code requirements, Generators with a CUSC Contract would meet one or more of the requirements of the System Defence Plan.	As the Generator has a CUSC contract and obliged to satisfy the requirements of the Grid Code, then such parties would be within the scope of NCER. BC 3* applies to Large Power Stations and directly connected Power Stations.

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
as defence service providers pursuant to Article 4(4)				
Type A and Type B Power Generating Modules referred to in paragraph 3, demand facilities and closed distribution systems providing demand response may fulfil the requirements of this Regulation either directly or indirectly through a third party under the terms and conditions set out in accordance with Article 4(4)	New and Existing	BM Participants	BC1, BC2,(ECC/CC.6.5 applies only)	This is a non-mandatory requirement. If a BM Party owns or operates a Type A or Type B Power Generating Module, this would fall under the requirements of RfG. They would also need to comply with the requirements of BC1 and BC2 and therefore fall under the scope of NCER. If the party is also a EU Code User, the wider requirements of the Grid Code would apply (ie ECC's ,ECP's and OC's would also apply in which case they would also considered to be within the scope of NCER. If an existing BM Party owns or operates a Small Power Station they would need to meet the requirements of BC, BC2 and CC.6.5. They would be treated as being within the scope of NCER. If an Aggregator registered as a BM Party has generation and/or demand and required to meet the requirements of the applicable

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
				Balancing Codes this would also fall under the requirements of NCER
This Regulation shall apply to energy storage units of a SGU, a defence service provider or restoration service provider which can be used to balance	New	Any EU Code Generator which has a CUSC Contract with the ESO and which owns and operates Electricity Storage Modules would be classified as a	Applicable Grid Code requirements: PC, ECC, ECP, OC1, OC5, OC6 (in particular OC6.6) , OC7, OC10, OC12, BC1, BC2, BC3*, DRC	Under the GC0096 proposals, when a Storage Plant is in an importing mode of operation, and the System Frequency falls automatic tripping is required in accordance with the requirements of OC6.6. Within GB, the capability to switch from import to export during low system frequency conditions is not required. Tripping will be initiated prior to the start of Low Frequency Demand Disconnection which occurs at 48.8Hz.

EU Criteria	New or Existing	List of GB Parties considered to be SGUs for purposes of the System Defence Plan (GB SGU's)	Measures of the System Defence Plan	Comments
the system, provided that they are identified as such in the system defence plans restoration plans or service contract.		Storage User as defined under the GC0096 Grid Code proposals	Under the GC0096 proposals, Electricity Storage Modules are treated in the same way as Power Generating Modules. Generators who have a CUSC Contract with the ESO who own and/or operate Electricity Storage Modules would therefore be within the scope of NCER.	All the other requirements of the Grid Code apply and therefore Storage Units caught under the proposed requirements of GC0096 would be considered to be within the scope of NCER.
	Existing	Any CUSC Party who owns or operates Storage plant	Applicable Grid Code requirements: PC, CC, CP, OC1, OC5, OC6, OC7, OC10, OC12, BC1, BC2, BC3*, DRC	A CUSC Party owning a Storage plant would be required to satisfy the requirements of the Grid Code and hence would be considered to be within the scope of NCER. The technical requirements applicable to the storage plant including the ability to trip during low system frequencies will be as specified in the Bilateral Agreement.

Table 1.0

In addition, it is also very important to clarify those GB parties who would fall outside the scope of E&R NC and hence those parties who would not be classified as a SGU within GB, and therefore not have to comply with the requirements of E&R NC. These are also clarified in Appendix B of the System Defence and System Restoration Plan and reproduced below.

- *Any Embedded Generator in respect of a Medium or Small Power Station which does not have a CUSC Contract the ESO[4].*
- *Any Generator in respect of a Licence Exempt Embedded Medium Power Station (LEEMPS).*
- *A Demand Response Provider who does not have a CUSC Contract with the ESO*
- *Any HVDC System Owner or DC Converter Station Owner or Generator who owns and operates an HVDC System or DC Converter Station or Transmission DC Converter or DC Connected Power Park Module which does not have a CUSC Contract or Interconnector Agreement with the ESO*
- *BM parties that are not required to meet the requirements of BC1, BC2 and CC.6.5 or ECC.6.5.*

  .
- *Any party which is not required to satisfy the requirements of the Grid Code.*

For the avoidance of doubt, the ESO, Transmission Licensees and Distribution Network Operators are not classified as Significant Grid Users (SGU) though they are required to satisfy the requirements of the NCER.

Notification

Some Workgroup members; noting the requirements in Articles 12 (3)-(5) and 24 (3)-(5); stated that they had not been notified by NGESO (or DSO, if applicable) of the fact that they are an SGU in the manner required by the E&R NC. The Proposer stated that they had notified SGUs that they were captured by publishing the SDP and the SRP with the criteria outlined in Annex A on the NGESO website. A Workgroup member highlighted that if the E&R NC had meant for this notification action to be completed in this way it would have stated for it to be published on the website as it does in some other areas of the Network Codes and therefore, this was not, in their view, the intent of the word 'notification' in E&R NC. The Workgroup member expanded to state that notification maybe considered by NGESO to be onerous but if this is what is required by EU law this is what should happen or have happened. An example of another notification was highlighted in Article 24(6) (b) in terms of how the SGUs have implemented and maintained the measures required.

The initial view of the Proposer was to publish an Open Letter to fulfil this obligation on NGESO to notify where potential SGUs could themselves self-determine whether they were an SGU. Workgroup members did not feel that this would sufficiently fulfil the

[4] NGESO.

NGESO's (or, if relevant, DSO's) obligation to notify. Workgroup members also noted that if there were notified of being an SGU that they would have a further twelve months from the date of the notification to implement their obligations.

It was additionally highlighted that it is not just the Transmission System Operator that is obligated to carry out the notification to SGUs but that the Distribution System Operators also need to carry out some of the notifications to SGUs. Some Workgroup members also discussed that even if they had new obligations outlined in the Grid Code that if they had not been notified, according to E&R NC, that they would not have to comply with them as a result as the Grid Code changes for E&R NC purposes (as per GC0127 and GC0128) were applicable to SGUs.

The Proposer outlined that as they have a two-stage approach to the implementation of the E&R NC (i.e. those requirements to be in place by 18 December 2019 and those to be in place by 18 December 2022) that there would have to be two notifications to SGUs on any new obligations when they have been fully developed within the Grid Code modifications required.

The Proposer acknowledged there were two issues here. The first was the definition of an SGU which has been clarified through Appendix B of the SDP and SRP issued by NGESO for public consultation on 10th July 2019. The second is how would a GB party who is within the scope of E&R NC be notified that they were an SGU. On the basis that stakeholders considered an Open Letter not to be sufficient at the last meeting, the Proposer agreed to take this issue away and consider a more appropriate solution.

The Proposer subsequently clarified to the Workgroup that they would be sending a notification letter to each SGU, Defence Service Provider and/or Restoration Service Provider as applicable. A Workgroup member questioned whether this would detail all of the measures required to be implemented by the SGU; as per the requirements in Articles 12 (3)-(5) and 24 (3)-(5). The Proposer stated that the revised System Defence and System Restoration Plan included these measures. A Workgroup member stated that they believe that when the E&R NC was drafted that the intention of it was for it to be clear to each SGU what measure(s) they needed to undertake and by when. The Proposer noted that with the proposed approach set out in Appendix A and B of the SDP and SRP that if the party does not have a CUSC contact with the NGESO or they are not a BM Participant, then there would be significant costs for those parties if they were classified as an 'SGU. If non-CUSC or non-BM participating parties were defined as 'SGUs' then the cost of instructing such parties would not be insignificant. However, a Workgroup member noted that the scope of E&R NC, as set out in Article 2, did extend to Type B (1MW plus) generation and could, as per Article 2(3), extend to Type A (800W plus) generation at both transmission and distribution.

In response, the Proposer reiterated their view of the treatment of a SGU, Defence Service Provider and Restoration Service Provider as discussed in the earlier section titled Significant Grid Users in GB. The Proposer is fully aware that a Workgroup member may raise a "potential Alternative" with regard to this Interpretation.

Updates to the System Defence and System Restoration plans following Ofgem approval and link to GC0127 and GC0128

The Proposer highlighted to the Workgroup within their proposed solution for GC0127 and GC0128 that the position outlined does not match what had been published by

NGESO in the System Defence Plan and the System Restoration Plan submitted to Ofgem on 18 December 2018. It was noted that Ofgem had; in their letter[5] of 21st June 2019,requested amendments to the two Plans submitted in December 2018 and as a consequence the System Defence Plan and System Restoration Plan had been substantially updated by NGESO and released for consultation[6]. The timetable for these two Plans is as follows:

Stage	Date
Submission of the SDP and SRP to Ofgem	18/12/2018
Request for amendment from Ofgem	w/c 17/06/2019
Electricity System Operator/Transmission System Operator to consult on amendments	Consultation opened on 10 July 2019
Resubmission of the SDP and SRP to Ofgem	By 18/08/2019
Ofgem decision on whether to approve the SDP and SRP	Two months following re-submission – around 18 October 2019

The Workgroup concluded that it would be most efficient and pragmatic to carry out this Workgroup Consultation at the same time as the NGESO July Consultation on the amendments to the SDP and SRP.

Definitions

The Proposer outlined their position with regard to the proposed definitions, for the purposes of GC0127 and GC0128, below;

[5] https://www.ofgem.gov.uk/publications-and-updates/request-amendment-electricity-system-operator-s-proposal-under-eu-emergency-and-restoration-network-code?utm_medium=email&utm_source=dotMailer&utm_campaign=Daily-Alert_21-06-2019&utm_content=Request+for+amendment+to+the+Electricity+System+Operator%e2%80%99s+proposal+under+the+EU+Emergency+and+Restoration+Network+Code&dm_i=1QCB,6CHYE,UWA0T7,P3CJO,1

[6] https://www.nationalgrideso.com/codes/european-network-codes/meetings/emergency-and-restoration-consultation-open

Definition	Meaning
Defence Service Provider	A Defence Service Provider is a legal entity with a legal or contractual obligation to provide a service contributing to one or several measures of the System Defence Plan. In GB, a Defence Service Provider has the same meaning as a GB Significant Grid User (GB SGU)
Restoration Service Provider	A restoration service provider refers to "a legal entity with a legal or contractual obligation (including a Black Start Service Provider) to provide a service contributing to one or several measures of the restoration plan". In GB, a Restoration Service Provider is a GB Significant Grid User (GB SGU) and/or a Black Start Service Provider.

GC0127 Article specific discussions

E&R NC Articles covered in this modification:

Article 15(3) Automatic under frequency control
Article 21(1)(b) Assistance for active power
Article 45 Compliance testing
Article 47, Compliance testing of low frequency demand disconnection relays

Article 15(3) and (4) Automatic under frequency control

The Proposer stated that this would be one of the main amendments required to the Grid Code as a result of the SDP. It was noted that there is a requirement for storage units to automatically switch from demand mode to generation mode and that this had not been covered as part of the ongoing modification to the Grid Code on Storage (GC0096). As noted above the Proposer now believes this issue has been addressed through the approach detailed in Section 3 of this document.

Article 21(1)(b) Assistance for active power

The Workgroup concluded that no extra requirements were needed in the Grid Code as a result of this Article.

Test Plan and Article 43

A Workgroup member questioned where the test plan was as required in Article 43 (2) of the E&R NC which states that:

"*By 18 December 2019 each TSO shall define a test plan in consultation with the DSOs, the SGUs identified pursuant to Articles 11(4) and 23(4), the defence service providers and the restoration service providers. The test plan shall identify the equipment and capabilities relevant for the system defence plan and the restoration plan that have to be tested*."

The Workgroup member stated that a test plan was required to be developed by NGESO, in consultation with DSOs and SGUs. The Proposer stated that there would be testing requirements outlined for Article 44-47. To address this concern amendments have been proposed to be introduced to the Grid Code (via GC0127 and GG0128) in respect of Articles 44, 45 and 47 as noted above in Section 3. In the view of the Proposer there is no requirement for amendments in respect of Article 46 as these are already covered by the proposals under consideration as part of the GC0125 Modification. However, the Proposer has yet to clarify when the consultation, with DSOs and SGUs, on the test plan required by Article 43(2) will be undertaken.

Article 47

The Proposer outlined that this was around protection and they required some more information on how this is completed. A Workgroup member took away an action to look into this and provide this to the Workgroup. Additional amendments have also been proposed to be introduced to the Grid Code via GC0127 and GC0128 as noted in Section 3 above as part of this requirement.

Other

A Workgroup member noted that in their view there also need a for a dedicated testing procedure as a result of Article 51 (2) which states that:

"*In addition, where deemed necessary by the TSO for the effectiveness of the restoration plan, each TSO shall execute operational testing of parts of the restoration plan, in coordination with the DSOs identified pursuant to Article 23(4) and the restoration service providers. The TSO shall set out, in consultation with the DSOs and restoration service providers, those operational tests in a dedicated testing procedure.*"

The Workgroup member noted that the testing procedure would need to be prepared in consultation with DSOs and SGUs and that the operational testing would be executed by the TSO after coordination with the DSOs and SGUs. The Workgroup noted this and agreed to develop a solution. The Proposer has added additional commentary to this

item in the mapping table noting that internal procedures do exist although some further work is still necessary.

GC0128 Article specific discussions

Activation of re-energisation procedure Article 27(4)

Frequency leader

It was noted that in respect of Article 27 that the allocation of the functional responsibility of this Article for GB purposes in terms of the re-energisation procedure had been allocated by Ofgem[7] and that this could not be changed. In general, NGESO is responsible for the re-energisation procedure with specific responsibilities defined in STCP 06-1 (Black Start). The Workgroup and the Proposer agree that these responsibilities were not well articulated in the SRP and therefore the Proposer has suggested amendments to sections 3.2.1, 3.3.1, 3.3.2 and 3.3.4 of the Grid Code to clarify the situation.

Is there discrimination and if so how is this justified?

A Workgroup member questioned why there were different in treatment between Types B, C and D generation within the proposed definition of a SGU in the SRP (and SDP). The Workgroup member requested that the Proposer justify as to why Type B, Type C and Type D generator were being treated differently; i.e. with two identical plant, one would be categorised as a SGU (if connected at transmission or embedded with a CUSC contract or being a BM Participant) and one would not (if connected at distribution but without a CUSC contract or not being a BM participant).

It was also noted that Embedded Generation which does not have a CUSC contract or is not a BM Participant (i.e. not part of an Aggregator, which is bound by the requirements of BC1 and BC2) then it is not impacted by the GC0127 or GC0128 Modifications.

The Proposer clarified that this issue is similar to that raised through Grid Code Consultation GC0106 (*https://www.nationalgrideso.com/codes/grid-code/modifications/gc0106-data-exchange-requirements-accordance-regulation-eu-20171485*) which had resulted in the formation of Grid Code Working Group GC0117 https://www.nationalgrideso.com/codes/grid-code/modifications/gc0117-improving-transparency-and-consistency-access-arrangements GC0117 seeks to review the definitions of Large, Medium and Small Power Stations in the GB so that Generation across GB (based on size) would have to progress through the same connection process and submit the same data required under the Grid Code. There are similar issues with the treatment of GB Generation so far as the implementation of NCER is

[7] https://www.ofgem.gov.uk/publications-and-updates/minded-decision-assignment-tso-obligations-under-three-eu-network-codes

concerned. However, a Workgroup member noted that GC0117, if applicable (and approved by Ofgem) would only address part of the discriminatory treatment that arose with GC0127 and GC0128 and would not, for example, address the difference in treatment for Type B generators. Workgroup members noted that if GC0117 adopted a threshold between Large and Small Power Stations of 10MW this would automatically include Type C and Type D PGMs within the scope of the Grid Code and hence the requirements of GC0127 and GC0128 would apply to them in the longer term. However, it was noted that there was the potential for other solutions or thresholds to be raised by other Workgroup members which may affect the eventual outcome.

GC0096 Energy Storage modification implications on GC0127 and GC0128

The Workgroup noted the recent GCRP decision[8] for GC0096 to be sent back to its Workgroup for further work ahead of being submitted to the Authority for decision. They discussed the fact that as these GC0127 and GC0128 Modifications are for compliance for the E&R NC that they should not be reliant on a decision on another Modification (GC0096)

The Code Administrator and Workgroup decided that the best approach would be to 'pull' the GC0096 proposed definitions and related text that would be required for (GC0127 and GC0128) to be implemented into those two Modifications. This is related to Article 15(3) of the E&R NC.

Due to this decision and approach adopted the proposed changes that have been lifted from the proposed GC0096 legal text are highlighted in blue in the draft Legal Text for GC0127 and GC0128. This means that if GC0096 does not get approved by the Authority for any reason, or it is sent back for further work, that GC0127 and GC0128 can be fully implemented.

Storage in the context of GC0127 and GC0128

The Workgroup also discussed whether existing storage parties should be captured by these two Modifications (for the avoidance of doubt, new storage parties would be captured). The Proposer felt that this should not be the case but also recognised that the E&R NC does apply to both new and existing parties. The updates proposed as part of these two Modifications are generally considered minor. The parties most likely to be affected are those who own and operate existing storage plant. Since storage plant is now required to trip when in an import mode of operation and system frequency is low and these conditions are subject to the requirements of the Bilateral Agreement it is considered these requirements are minor. As to the rationale for the treatment of storage this has been clarified in Section 3 above.

Balancing Mechanism Participants

Under the July 2019 revised amendments to the System Defence Plan and System Restoration Plan Appendix B now defines what an SGU is which extends to BM

[8] The decision was made at the 27 June 2019 Grid Code Review Panel meeting.

Participants who are required to satisfy the requirements of BC1 and BC2 of the Grid Code.

High Priority Significant Grid Users

The Proposer noted that as request by Ofgem in their June 2019 letter the Appendix C of the System Defence Plan and System Restoration Plan have been updated by NGESO in July to now define what a 'High Priority Significant Grid User' is in the context of GB.

The Proposer stated for the purposes of the System Defence Plan a 'High Priority Significant Grid User', as defined in in Appendix C, would be one of the following:

- Generating Units, Power Park Modules and Power Generating Modules at a Power Station directly connected to the National Electricity Transmission System with priority given to Synchronous Generation; or
- Generating Units, Power Park Modules and Power Generating Modules at a Power Station with a Registered Capacity of 100MW or more with priority given to Synchronous Generation.

The Proposer stated for the purposes of the System Restoration Plan a 'High Priority Significant Grid User', as defined in in Appendix C, would be one of the following:

- A Black Start Service Provider; or
- Generating Units, Power Park Modules and Power Generating Modules at a Power Station directly connected to the National Electricity Transmission System with priority given to Synchronous Generation; or
- Generating Units, Power Park Modules and Power Generating Modules at a Power Station with a Registered Capacity of 100MW or more with priority given to Synchronous Generation.

A Workgroup member questioned whether the Electricity Supply Emergency Code (ESEC) priority user list of protected sites would be included as High Priority SGUs. The Proposer confirmed that they were not as they were already covered as part of National Legislation.

It was also confirmed that for the purposes of the SDP and SRP Appendix C approach that there are around a thousand such sites in GB that are considered to be High Priority SGUs. A Workgroup member questioned whether these sites had been contacted by NGESO (or the DSOs) to work in co-ordination with them to understand their needs. NGESO stated that they would consider whether the High Priority SGUs should just cover those sites as per Appendix C of the SDP and SRP respectively or whether this should be extended to all Distribution Connected Generators in which case there would be thousands of parties that would have classified as 'High Priority SGUs; and who would then need to have been contacted to work in co-ordination with NGESO in forming their Restoration and Defence Plans. In relation to this issue NGESO have

been in contact with Ofgem after the last Workgroup meeting and the view from Ofgem was that as these sites were already part of National Legislation and there was no need for them to be included in the list of High Priority Significant Grid Users.

IDNOs and Closed Distribution Systems

A Workgroup member stated that their interpretation of the wording in E&R NC Articles 2 and 24 (2) (d) was that there were E&R NC requirements that apply to the IDNOs and Closed Distribution Systems (CDSOs), Type B and Type C PGMs in GB, as well as Distribution Connected generators who should have been contacted and their needs taken on board by NGESO when developing the SDP and SRP.

The Proposer agrees that Transmission Connected IDNOs and Transmission Connected Closed Distribution Systems would be within the scope of E&R NC but not those which are connected to the Distribution network. This issue is resolves around the treatment of SGUs, Defence Service Providers and Restoration Service Providers as discussed earlier in this section.

Implementation of the restoration plan

In respect of implementation of the restoration plan as described in Article 24, as it pertains to High Priority SGUs, IDNOs and CDSOs, and parties connected at Distribution including Types B, C and D PGMs. A Workgroup member stated that as a result of the discussions in the Workgroup that they would like to raise a potential alternative solution to ensure that GC0128 cover this implementation aspect.

The Workgroup will be considering this during this Workgroup Consultation.

Please note Question Q6 in your response proforma, the Workgroup would like to seek your view on this interpretation.

Q6. A Workgroup member has an alternate interpretation of a SGU, SRP and SDP as part of the modification and is considering raising an alternative solution; what are your views on this?

Activation instructions

The Workgroup discussed Article 40(1) (b) (i to iv) and it was noted that there was a requirement to have an activation plan for restoration of the system following a black out. They discussed the fact that there was an activation plan outlined in SOGL Article 18 and that this activation plan had not been implemented into the Grid Code. Some Workgroup members stated that they thought it should have been. The Proposer noted this and has amended section 2.1.1 of the System Restoration Plan.

Summary of amendments to the Grid Code as part of GC0127 and GC0128

The Proposer stated that there would be no new major requirements proposed as part of these two Modifications for any Grid Code User to undertake other than those which should already be undertaken as part of their existing Grid Code obligations. This is based on the interpretation of the E&R NC by NGESO as Proposer. The Workgroup did discuss this. One Workgroup member did however have an alternative interpretation and noted that as a result of being classified as an SGU for the purposes of E&RNC that Grid Code Users would then have additional requirements, which stem from E&R NC, that they would be bound to comply with.

Extracts from Articles 2, 4, 11.4(c) and 23.4 (c) of E&R NC

Article 2 of E&R NC States:

1. *This Regulation shall apply to TSOs, DSOs, SGUs, defence service providers, restoration service providers, balance responsible parties, balancing service providers, nominated electricity market operators ('NEMO') and other entities designated to execute market functions pursuant to Commission Regulation (EU) 2015/1222 (1) and to Commission Regulation (EU) 2016/1719 (2)*

2. *In particular, this Regulation shall apply to the following SGUs:*
   - *(a) existing and new power generating modules classified as type C and D in accordance with the criteria set out in Article 5 of Commission Regulation (EU) 2016/631 (3);*
   - *b) existing and new power generating modules classified as type B in accordance with the criteria set out in Article 5 of Regulation (EU) 2016/631, where they are identified as SGUs in accordance with Article 11(4) and Article 23(4);*
   - *(c) existing and new transmission-connected demand facilities;*
   - *(d) existing and new transmission connected closed distribution systems;*
   - *(e) providers of re-dispatching of power generating modules or demand facilities by means of aggregation and providers of active power reserve in accordance with Title 8 of Regulation (EU) 2017/1485; and*
   - *(f) existing and new high voltage direct current ('HVDC') systems and direct current-connected power park modules in accordance with the criteria set out in Article 4(1) of Commission Regulation (EU) 2016/1447 (1).*

3. *This Regulation shall apply to existing and new type A power generating modules, in accordance with the criteria set out in Article 5 of Regulation (EU) 2016/631, to existing and new type B power generating modules other than those referred to in paragraph 2(b), as well as to existing and new demand facilities, closed distribution systems and third parties providing demand response where they qualify as defence service providers or restoration service providers pursuant to Article 4(4).*

4. *Type A and type B power generating modules referred to in paragraph 3, demand facilities and closed distribution systems providing demand response may fulfil the requirements of this Regulation either directly or*

indirectly through a third party, under the terms and conditions set in accordance with Article 4(4).

5. *This Regulation shall apply to energy storage units of a SGU, a defence service provider or a restoration service provider, which can be used to balance the system, provided that they are identified as such in the system defence plans, restoration plans or in the relevant service contract.*

6. *This Regulation shall apply to all transmission systems, distribution systems and interconnections in the Union except transmission systems and distribution systems or parts of the transmission systems and distribution systems of islands of Member States of which the systems are not operated synchronously with Continental Europe, Great Britain, Nordic, Ireland and Northern Ireland or Baltic synchronous area, provided that this non-synchronous operation does not result from a disturbance.*

7. *In Member States where more than one transmission system operator exists, this Regulation shall apply to all transmission system operators within that Member State. Where a transmission system operator does not have a function relevant to one or more obligations under this Regulation, Member States may provide that the responsibility for complying with those obligations is assigned to one or more different, specific transmission system operators.*

8. *The TSOs of Lithuania, Latvia and Estonia are, as long as and to the extent that they are operating in a synchronous mode in a synchronous area where not all countries are bound by Union legislation, exempted from the application of Articles 15, 29 and 33, unless otherwise provided for in a cooperation agreement with third country TSOs constituting the basis for their cooperation concerning secure system operation in accordance with Article 10.*

Article 4 of E&R NC states

1. *When applying this Regulation, Member States, regulatory authorities, competent entities and system operators shall:*

(a) apply the principles of proportionality and non-discrimination;

(b) ensure transparency;

(c)apply the principle of optimisation between the highest overall efficiency and lowest total costs for all parties involved;

(d) ensure that TSOs make use of market-based mechanisms as far as is possible to ensure network security and stability;

(e) respect technical, legal, personal safety and security constraints;

(f) respect the responsibility assigned to the relevant TSO in order to ensure system security, including as required by national legislation;

(g) consult with relevant DSOs and take account of potential impacts on their system;

And

(h) take into consideration agreed European standards and technical specifications.

2. *Each TSO shall submit the following proposals to the relevant regulatory authority in accordance with Article 37 of Directive 2009/72/EC for approval:*

(a) the terms and conditions to act as defence service providers on a contractual basis in accordance with paragraph 4;

(b) the terms and conditions to act as restoration service providers on a contractual basis in accordance with paragraph 4;

(c) the list of SGUs responsible for implementing on their installations the measures that result from mandatory requirements set out in Regulations (EU) 2016/631, (EU) 2016/1388 and (EU) 2016/1447 and/or from national legislation and the list of the measures to be implemented by these SGUs, identified by the TSOs under Art. 11(4)(c) and 23(4)(c);

(d) the list of high priority significant grid users referred to in Articles 11(4)(d) and 23(4)(d) or the principles applied to define those and the terms and conditions for disconnecting and re-energising the high priority grid users, unless defined by the national legislation of Member States.

(e) the rules for suspension and restoration of market activities in accordance with Article 36(1);

(f) specific rules for imbalance settlement and settlement of balancing energy in case of suspension of market activities, in accordance with Article 39(1);

(g) the test plan in accordance with Article 43(2).

3. *Where a Member State has so provided, the proposals referred to in points (a) to (d) and (g) of paragraph 2 may be submitted for approval to an entity other than the regulatory authority. Regulatory authorities and entities designated by the Member States pursuant to this paragraph shall decide on the proposals referred to in paragraph 2 within six months from the date of submission by the TSO.*

4. *The terms and conditions to act as defence service provider and as restoration service provider shall be established either in the national legal framework or on a contractual basis. If established on a contractual basis, each TSO shall develop by 18 December 2018 a proposal for the relevant terms and conditions, which shall define at least:*

(a) the characteristics of the service to be provided;

(b) the possibility of and conditions for aggregation; and

(c) for restoration service providers, the target geographical distribution of power sources with black start and island operation capabilities.

5. *By 18 December 2018, each TSO shall notify the regulatory authority or the entity designated by the Member State the system defence plan*

designed pursuant to Article 11 and the restoration plan designed pursuant to Article 23, or at least the following elements of those plans:

(a) the objectives of the system defence plan and the restoration plan, including the phenomena to be managed or the situations to be solved; (b) the conditions triggering the activation of the measures of the system defence plan and the restoration plan;

(c) the rationale of each measure, explaining how it contributes to the objectives of the system defence plan and the restoration plan, and the party responsible for implementing those measures; and

(d) the deadlines set out pursuant to Articles 11 and 23 for the implementation of the measures.

6. *Where a TSO is required or permitted under this Regulation to specify, establish or agree on requirements, terms and conditions or methodologies that are not subject to approval in accordance with paragraph 2, Member States may require prior approval by the regulatory authority, the entity designated by the Member State or other competent authorities of the Member States of these requirements, terms and conditions or methodologies.*

7. *If a TSO deems an amendment to the documents, approved in accordance with paragraph 3, to be necessary, the requirements provided for in paragraphs 2 to 5 shall apply to the proposed amendment. TSOs proposing an amendment shall take into account the legitimate expectations, where necessary, of power generating facility owners, demand facility owners and other stakeholders based on the initially specified or agreed requirements or methodologies.*

8. *Any party can complain against a relevant system operator or TSO in relation to that relevant system operator's or TSO's obligations or decisions under this Regulation and may refer the complaint to the regulatory authority which, acting as dispute settlement authority, shall issue a decision within two months after receipt of the complaint. That period may be extended by a further two months where additional information is sought by the regulatory authority. That extended period may be further extended with the agreement of the complainant. The regulatory authority's decision shall be binding unless and until overruled on appeal.*

Article 11.4(c) NC states

4. In particular, the system defence plan shall include the following elements

(c) a list of the SGUs responsible for implementing on their installations the measures that result from the mandatory requirements set out in Regulation (EU) 2016/631, (EU) 2016/1388 and (EU) 2016/1447 or from national legislation and a list of the measures to be implemented by those SGUs;

Article 23(4)(c) NC states

4. In particular, the restoration plan shall include the following elements:

(c) a list of the SGUs responsible for implementing on their installations the measures that result from mandatory requirements set out in Regulations (EU) 2016/631, (EU) 2016/1388 and (EU) 2016/1447 or from national legislation and a list of the measures to be implemented by those SGUs;

6 Relevant Objectives

Impact of the modification on the Applicable Grid Code Objectives:	
Relevant Objective	Identified impact
(a) To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity	Neutral
(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);	Neutral
(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;	Positive (The ability to request assistance from SGUs and incorporating storage into system defence and restoration will allow for additional system security)
(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	Positive (Discharges the obligations of the Emergency and Restoration code into GB frameworks)
(e) To promote efficiency in the implementation and administration of the Grid Code arrangements	None

7 Implementation

The SDP and SRP must be implemented by 18 December 2019 (2 years after E&R NC entered into force), therefore this modification must also by implemented by 18 December 2019.

This modification will be implemented 10 working days after Authority decision or by the latest date of 17/12/2019.

8 How to respond

The GC0127 & GC0128 Workgroup is seeking the views of Grid Code Parties and other interested parties in relation to the issues noted in this document and specifically in response to the questions highlighted in the report and summarised below:

Standard Workgroup Consultation questions:

Q1: Do you believe that GC0127 & GC0128 Original proposals better facilitate the Grid Code Objectives?

Q2: Do you support the proposed implementation approach?

Q3: Do you have any other comments?

Q4: Do you wish to raise a Workgroup Consultation Alternative request for the Workgroup to consider?

Specific GC0127 & GC0128 Workgroup Consultations Questions:

Q5. Do you think the wording in OC9.2.5 could be improved, if so what do you suggest? Please note that the legal text can be located in Annex 4.

Q6. A Workgroup member has an alternate interpretation of a SGU, SRP and SDP as part of the modification and is considering raising an alternative solution; what are your view on this?

Please send your response using the response proforma which can be found on the National Grid website via the following link:

https://www.nationalgrideso.com/codes/grid-code/modifications/gc0127-eu-code-emergency-restoration-requirements-resulting-system

In accordance with the Grid Code Governance Rules of, Any Authorised Electricity Operator; the Citizens Advice or the Citizens Advice Scotland, The Company or a Materially Affected Party may also raise a Workgroup Consultation Alternative Request. If you wish to raise such a request, please use the relevant form available at the weblink below:

http://www.nationalgrid.com/uk/Electricity/Codes/systemcode/amendments/forms_guidance/

Views are invited upon the proposals outlined in this report, which should be received by **5pm** on **16 August 2019**.

Your formal responses may be emailed to: grid.code@nationalgrideso.com

If you wish to submit a confidential response, please note that information provided in response to this consultation will be published on National Grid's website unless the response is clearly marked "Private & Confidential", we will contact you to establish the extent of the confidentiality. A response market "Private & Confidential" will be disclosed to the Authority in full but, unless agreed otherwise, will not be shared with the Grid Code Review Panel or the industry and may therefore not influence the debate to the same extent as a non-confidential response.

Please note an automatic confidentiality disclaimer generated by your IT System will not in itself, mean that your response is treated as if it had been marked "Private and Confidential"

Annex 1 – Terms of Reference

Workgroup Terms of Reference and Membership

TERMS OF REFERENCE FOR GC0127 WORKGROUP

GC0127 – EU Code Emergency & Restoration: Requirements resulting from System Defence Plan

Responsibilities

1. The Workgroup is responsible for assisting the Grid Code Review Panel in the evaluation of Grid Code Modification Proposal **GC0127 – EU Code Emergency & Restoration: Requirements resulting from System Defence Plan** proposed by Rachel Woodbridge Stocks of National Grid Electricity System Operator in April 2019 and presented to the Grid Code Review Panel on 25 April 2019.

2. The proposal must be evaluated to consider whether it better facilitates achievement of the Grid Code Objectives. These can be summarised as follows:

   (i) *To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity;*

   (ii) *To facilitate 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);*

   (iii) *Subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution systems in the national; and*

   (iv) *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. In conducting its business, the Workgroup will at all times endeavour to operate in a manner that is consistent with the Code Administration Code of Practice principles.*

   (v) *To promote efficiency in the implementation and administration of the Grid Code arrangements.*

Scope

3. The Workgroup must consider the issues raised by the Modification Proposal and consider if the proposal identified better facilitates achievement of the Grid Code Objectives.

4. In addition to the overriding requirement of point 3 above, the Workgroup shall consider and report on the following specific issues:
   a) *Implementation and costs;*

b) Review draft legal text should it have been provided. If legal text is not submitted within the Grid Code Modification Proposal the Workgroup should be instructed to assist in the developing of the legal text; and

c) Consider whether any further Industry experts or stakeholders should be invited to participate within the Workgroup to ensure that all potentially affected stakeholders have the opportunity to be represented in the Workgroup. Demonstrate what has been done to cover this clearly in the report

d) Confirm when GC0127 requirements would apply to Users

e) Are there any cross-code impacts?

f) Consider the impacts on Grid Code Users

- *whether all types of storage are affected or those classified as SGU's*
- *the load disconnection, frequencies and profiles being used*
- *how to maintain the commercial services that are currently provided*
- *Seek a view from the NGESO in regards to the impact on system inertia*

g) Consider how balancing services will be obtained from Users that do not currently provide them

5. As per Grid Code GR20.8 (a) and (b) the Workgroup should seek clarification and guidance from the Grid Code Review Panel when appropriate and required.

6. The Workgroup is responsible for the formulation and evaluation of any Workgroup Alternative Grid Code Modifications arising from Group discussions which would, as compared with the Modification Proposal or the current version of the Grid Code, better facilitate achieving the Grid Code Objectives in relation to the issue or defect identified.

7. The Workgroup should become conversant with the definition of Workgroup Alternative Grid Code Modification which appears in the Governance Rules of the Grid Code. The definition entitles the Group and/or an individual member of the Workgroup to put forward a Workgroup Alternative Code Modification proposal if the member(s) genuinely believes the alternative proposal compared with the Modification Proposal or the current version of the Grid Code better facilitates the Grid Code objectives The extent of the support for the Modification Proposal or any Workgroup Alternative Modification (WAGCM) proposal WAGCM arising from the Workgroup's discussions should be clearly described in the final Workgroup Report to the Grid Code Review Panel.

8. Workgroup members should be mindful of efficiency and propose the fewest number of WACM proposals as possible. All new alternative proposals need to be proposed using the Alternative Request Proposal form ensuring a reliable source of information for the Workgroup, Panel, Industry participants and the Authority.

9. All WAGCM proposals should include the Proposer(s)'s details within the final Workgroup report, for the avoidance of doubt this includes WACM proposals which are proposed by the entire Workgroup or subset of members.

10. There is an option for the Workgroup to undertake a period of Consultation in accordance with Grid Code GR. 20.11, if defined within the timetable agreed by the Grid Code Panel. Should the Workgroup determine that they see the benefit in a Workgroup Consultation being issued they can recommend this to the Grid Code Review Panel to consider.

11. Following the Consultation period the Workgroup is required to consider all responses including any Workgroup Consultation Alternative Requests. In undertaking an assessment of any Workgroup Consultation Alternative Request, the Workgroup should consider whether it better facilitates the Grid Code Objectives than the current version of the Grid Code.

12. As appropriate, the Workgroup will be required to undertake any further analysis and update the appropriate sections of the original Modification Proposal and/or WAGCM proposals (Workgroup members cannot amend the original text submitted by the Proposer of the modification) All responses including any Workgroup Consultation Alternative Requests shall be included within the final report including a summary of the Workgroup's deliberations and conclusions. The report should make it clear where and why the Workgroup chairman has exercised their right under the Grid Code to progress a Workgroup Consultation Alternative Request or a WAGCM proposal against the majority views of Workgroup members. It should also be explicitly stated where, under these circumstances, the Workgroup chairman is employed by the same organisation who submitted the Workgroup Consultation Alternative Request.

13. The Workgroup is to submit its final report to the Modifications Panel Secretary for circulation to Panel Members. The final report conclusions will be presented to the Grid Code Review Panel meeting at a Special Grid Code Review Panel meeting in mid September 2019.

Membership

It is recommended that the Workgroup has the following members:

Role	Name	Representing (User nominated)
Chair	Paul Mullen	Code Administrator
Technical Secretary	Chrissie Brown	Code Administrator
Proposer / Workgroup Member*	Tony Johnson	National Grid ESO
Workgroup Member*	Garth Graham	SSE Generation Ltd.
Workgroup Member*	Alastair Frew	Drax Generation Enterprise Ltd
Workgroup Member*	Grant McBeath	SP Energy Networks
Workgroup Member*	Paul Crolla	ScottishPower Renewables
Workgroup Member*	Richard Wilson	UK Power Networks

14. A (*) Workgroup must comprise at least 5 members (who may be Panel Members). The roles identified with an asterisk (*) in the table above contribute toward the required quorum, determined in accordance with paragraph 15 below.

15. The Grid Code Review Panel must agree a number that will be quorum for each Workgroup meeting. The agreed figure for GC0127 is that at least 5 Workgroup members must participate in a meeting for quorum to be met.

16. A vote is to take place by all eligible Workgroup members on the Modification Proposal and each WAGCM proposal and Workgroup Consultation Alternative Request based on their assessment of the Proposal(s) against the Grid Code objectives when compared against the current Grid Code baseline.

    - Do you support the Original or any of the alternative Proposals?
    - Which of the Proposals best facilitates the Grid Code Objectives?

    The Workgroup chairman shall not have a vote, casting or otherwise. The results from the vote and the reasons for such voting shall be recorded in the Workgroup report in as much detail as practicable.

17. It is expected that Workgroup members would only abstain from voting under limited circumstances, for example where a member feels that a proposal has been insufficiently developed. Where a member has such concerns, they should raise these with the Workgroup chairman at the earliest possible opportunity and certainly before the Workgroup vote takes place. Where abstention occurs, the reason should be recorded in the Workgroup report.

18. Workgroup members or their appointed alternate are required to attend a minimum of 50% of the Workgroup meetings to be eligible to participate in the Workgroup vote.

19. The Technical Secretary shall keep an Attendance Record for the Workgroup meetings and circulate the Attendance Record with the Action Notes after each meeting. This will be attached to the final Workgroup report.

20. The Workgroup membership can be amended from time to time by the Grid Code Review Panel and the Chairman of the Workgroup.

Appendix 1 – Indicative Workgroup Timetable

Please see the latest agreed timetable at the front of the modification report.

Workgroup Terms of Reference and Membership

TERMS OF REFERENCE FOR GC0128 WORKGROUP

GC0128 – EU Code Emergency & Restoration: Requirements resulting from System Restoration Plan

Responsibilities

1. The Workgroup is responsible for assisting the Grid Code Review Panel in the evaluation of Grid Code Modification Proposal **GC0128 – EU Code Emergency & Restoration: Requirements resulting from System Restoration Plan** proposed by Rachel Woodbridge Stocks of National Grid Electricity System Operator in April 2019 and presented to the Grid Code Review Panel on 25 April 2019.

2. The proposal must be evaluated to consider whether it better facilitates achievement of the Grid Code Objectives. These can be summarised as follows:

   (i) *To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity;*

   (ii) *To facilitate 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);*

   (iii) *Subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution systems in the national; and*

   (iv) *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. In conducting its business, the Workgroup will at all times endeavour to operate in a manner that is consistent with the Code Administration Code of Practice principles.*

   (v) *To promote efficiency in the implementation and administration of the Grid Code arrangements.*

Scope

3. The Workgroup must consider the issues raised by the Modification Proposal and consider if the proposal identified better facilitates achievement of the Grid Code Objectives.

4. In addition to the overriding requirement of point 3 above, the Workgroup shall consider and report on the following specific issues:
   a) *Implementation and costs;*

b) Review draft legal text should it have been provided. If legal text is not submitted within the Grid Code Modification Proposal the Workgroup should be instructed to assist in the developing of the legal text; and

c) Consider whether any further Industry experts or stakeholders should be invited to participate within the Workgroup to ensure that all potentially affected stakeholders have the opportunity to be represented in the Workgroup. Demonstrate what has been done to cover this clearly in the report

d) Confirm when GC0128 requirements would apply to Users

e) Are there any cross-code impacts?

f) Consider the impacts on Grid Code Users

g) Consider the impact of embedded generation as part of a black start restoration plan

h) who can be a frequency leader, and under what circumstances

5. As per Grid Code GR20.8 (a) and (b) the Workgroup should seek clarification and guidance from the Grid Code Review Panel when appropriate and required.

6. The Workgroup is responsible for the formulation and evaluation of any Workgroup Alternative Grid Code Modifications arising from Group discussions which would, as compared with the Modification Proposal or the current version of the Grid Code, better facilitate achieving the Grid Code Objectives in relation to the issue or defect identified.

7. The Workgroup should become conversant with the definition of Workgroup Alternative Grid Code Modification which appears in the Governance Rules of the Grid Code. The definition entitles the Group and/or an individual member of the Workgroup to put forward a Workgroup Alternative Code Modification proposal if the member(s) genuinely believes the alternative proposal compared with the Modification Proposal or the current version of the Grid Code better facilitates the Grid Code objectives The extent of the support for the Modification Proposal or any Workgroup Alternative Modification (WAGCM) proposal WAGCM arising from the Workgroup's discussions should be clearly described in the final Workgroup Report to the Grid Code Review Panel.

8. Workgroup members should be mindful of efficiency and propose the fewest number of WACM proposals as possible. All new alternative proposals need to be proposed using the Alternative Request Proposal form ensuring a reliable source of information for the Workgroup, Panel, Industry participants and the Authority.

9. All WAGCM proposals should include the Proposer(s)'s details within the final Workgroup report, for the avoidance of doubt this includes WACM proposals which are proposed by the entire Workgroup or subset of members.

10. There is an option for the Workgroup to undertake a period of Consultation in accordance with Grid Code GR. 20.11, if defined within the timetable agreed by the Grid Code Panel. Should the Workgroup determine that they see the benefit in a Workgroup Consultation being issued they can recommend this to the Grid Code Review Panel to consider.

11. Following the Consultation period the Workgroup is required to consider all responses including any Workgroup Consultation Alternative Requests. In undertaking an assessment of any Workgroup Consultation Alternative Request, the Workgroup should consider whether it better facilitates the Grid Code Objectives than the current version of the Grid Code.

12. As appropriate, the Workgroup will be required to undertake any further analysis and update the appropriate sections of the original Modification Proposal and/or WAGCM proposals (Workgroup members cannot amend the original text submitted by the Proposer of the modification) All responses including any Workgroup Consultation Alternative Requests shall be included within the final report including a summary of the Workgroup's deliberations and conclusions. The report should make it clear where and why the Workgroup chairman has exercised their right under the Grid Code to progress a Workgroup Consultation Alternative Request or a WAGCM proposal against the majority views of Workgroup members. It should also be explicitly stated where, under these circumstances, the Workgroup chairman is employed by the same organisation who submitted the Workgroup Consultation Alternative Request.

13. The Workgroup is to submit its final report to the Modifications Panel Secretary for circulation to Panel Members. The final report conclusions will be presented to the Grid Code Review Panel meeting to the Grid Code Review Panel in mid-September.

Membership

It is recommended that the Workgroup has the following members:

Role	Name	Representing (User nominated)
Chair	Paul Mullen	Code Administrator
Technical Secretary	Chrissie Brown	Code Administrator
Proposer / Workgroup Member*	Tony Johnson	National Grid ESO
Workgroup Member*	Garth Graham	SSE Generation Ltd.
Workgroup Member*	Alastair Frew	Drax Generation Enterprise Ltd
Workgroup Member*	Grant McBeath	SP Energy Networks
Workgroup Member*	Paul Crolla	ScottishPower Renewables
Workgroup Member*	Richard Wilson	UK Power Networks

14. A (*) Workgroup must comprise at least 5 members (who may be Panel Members). The roles identified with an asterisk (*) in the table above contribute toward the required quorum, determined in accordance with paragraph 15 below.

15. The Grid Code Review Panel must agree a number that will be quorum for each Workgroup meeting. The agreed figure for GC0128 is that at least 5 Workgroup members must participate in a meeting for quorum to be met.

16. A vote is to take place by all eligible Workgroup members on the Modification Proposal and each WAGCM proposal and Workgroup Consultation Alternative Request based on their assessment of the Proposal(s) against the Grid Code objectives when compared against the current Grid Code baseline.

- Do you support the Original or any of the alternative Proposals?

- Which of the Proposals best facilitates the Grid Code Objectives?

The Workgroup chairman shall not have a vote, casting or otherwise. The results from the vote and the reasons for such voting shall be recorded in the Workgroup report in as much detail as practicable.

17. It is expected that Workgroup members would only abstain from voting under limited circumstances, for example where a member feels that a proposal has been insufficiently developed. Where a member has such concerns, they should raise these with the Workgroup chairman at the earliest possible opportunity and certainly before the Workgroup vote takes place. Where abstention occurs, the reason should be recorded in the Workgroup report.

18. Workgroup members or their appointed alternate are required to attend a minimum of 50% of the Workgroup meetings to be eligible to participate in the Workgroup vote.

19. The Technical Secretary shall keep an Attendance Record for the Workgroup meetings and circulate the Attendance Record with the Action Notes after each meeting. This will be attached to the final Workgroup report.

20. The Workgroup membership can be amended from time to time by the Grid Code Review Panel and the Chairman of the Workgroup.

Appendix 1 – Indicative Workgroup Timetable

Please see the latest timetable approved by the Panel on the front of the modification report.

GC0127 / GC0128

LEGAL TEXT – DATED 19 JULY 2019

Extracts from GC0096 (Storage) are included in Blue Text

Extracts from G&D's

Electricity Storage	The conversion of electrical energy into a form of energy which can be stored, the storing of that energy, and the subsequent reconversion of that energy back into electrical energy.
Electricity Storage Module	Is either one or more **Synchronous Electricity Storage Unit**(s) or **Non-Synchronous Electricity Storage Unit**(s) which could also be part of a **Power Generating Module**. For the avoidance of doubt, **Non-Controllable Electricity Storage Equipment** would not be considered to be classed as an **Electricity Storage Module** or as an **Electricity Storage Unit**.
Non-Synchronous Electricity Storage Module	A **Power Park Module** comprising soley of one or more **Non-Synchronous Electricity Storage Units**.
Synchronous Electricity Storage Module	A **Synchronous Power Generating Module** which can convert or re-convert electrical energy from another source of energy such that the frequency of the generated voltage, the rotor speed and the frequency of network voltage are in a constant ratio and thus in synchronism. For the avoidance of doubt a **Synchronous Electricity Storage Module** could comprise of one or more **Synchronous Electricity Storage Units**.
Synchronous Electricity Storage Unit	A **Synchronous Generating Unit** which can supply or absorb electrical energy such that the frequency of the generated voltage, the rotor speed and the frequency of the equipment are in constant ratio and thus in synchronism with the network.

Extracts from CC's

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CC.6.5.4.4 Where **Control Telephony** or **System Telephony** is installed, routine testing of such facilities may be required by **The Company** (not normally more than once in any calendar month). The **GB Code User** and **The Company** shall use reasonable endeavours to agree a test programme and where **The Company** requests the assistance of the **User** in performing the agreed test programme the **User** shall provide such assistance. –**The Company** requires the **GB Code User** to test the backup power supplies feeding its **Control Telephony** facilities at least once every 5 years.

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CC.A.5.4 Low Frequency Relay Testing

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

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

CC.A.5.4.2 Each **Non-Embedded Customer** shall execute a low frequency demand disconnection test at least once every three years.

CC.A.5.4.3 Each **Network Operator** shall execute testing on its low frequency demand disconnection relays installed within its network at least once every three years.

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Extracts from ECC's

ECC.1 INTRODUCTION

ECC.1.1 The **European Connection Conditions** ("**ECC**") specify both:

(a) the minimum technical, design and operational criteria which must be complied with by:

(i) any **EU Code User** connected to or seeking connection with the **National Electricity Transmission System**, or

(ii) **EU Generators** or **HVDC System Owners** connected to or seeking connection to a **User's System** which is located in **Great Britain** or **Offshore**, or

(iii) **Network Operators** who are **EU Code Users**

(iv) **Network Operators** who are **GB Code Users** but only in respect of:-

(a) Their obligations in respect of **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** for whom the requirements of ECC.3.1(b)(iii) apply alone; and/or

(b) The requirements of this **ECC** only 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 **CC**s.

(v) **Non-Embedded Customers** who are **EU Code Users**

(b) the minimum technical, design and operational criteria with which **The Company** will comply in relation to the part of the **National Electricity Transmission System** at the **Connection Site** with **Users**. In the case of any **OTSDUW Plant and Apparatus**, the **ECC** also specify the minimum technical, design and operational criteria which must be complied with by the **User** when undertaking **OTSDUW**.

(c) The requirements of **European Regulation (EU) 2016/631** shall not apply to

(i) **Power Generating Modules** that are installed to provide backup power and operate in parallel with the **Total System** for less than 5 minutes per calendar month while the **System** is in normal state. Parallel operation during maintenance or commissioning of tests of that **Power Generating Module** shall not count towards that five minute limit.

(ii) **Power Generating Modules** connected to the **Transmission System** or **Network Operators System** which are not operated in synchronism with a **Synchronous Area**.

(iii) **Power Generating Modules** that do not have a permanent **Connection Point** or **User System Entry Point** and used by **The Company** to temporarily provide power when normal **System** capacity is partly or completely unavailable.

(iv) **Electricity Storage Modules**.

(d) **Storage Users** are required to comply with the entirety of the **ECC** but are not subject to the requirements of **European Regulation (EU) 2016/631**, **European Regulation (EU) 2016/1388** and **European Regulation EU 2016/1485**. The requirements of the **ECC** shall therefore be enforceable against **Storage Users** under the Grid Code only (and not under any of the aforementioned **European Regulations**) and any derogation sought by a **Storage User** in respect of the **ECC** shall be deemed a derogation from the Grid Code only (and not from the aforementioned **European Regulations**).

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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.

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ECC.3.6 The requirements of this **ECC** shall apply to **EU Code Users** in respect of **Power Generating Modules** (including **DC Connected Power Park Modules** and **Electricity Storage Modules**) and **HVDC Systems**.

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ECC.6.3 GENERAL POWER GENERATING MODULE, OTSDUW AND HVDC EQUIPMENT REQUIREMENTS

ECC.6.3.1 This section sets out the technical and design criteria and performance requirements for **Power Generating Modules** (which includes **Electricity Storage Modules**) and **HVDC Equipment** (whether directly connected to the **National Electricity Transmission System** or **Embedded**) and (where provided in this section) **OTSDUW Plant and Apparatus** which each **Generator** or **HVDC System Owner** must ensure are complied with in relation to its **Power Generating Modules**, **HVDC Equipment** and **OTSDUW Plant and Apparatus**. References to **Power Generating Modules**), **HVDC Equipment** in this ECC.6.3 should be read accordingly. For the avoidance of doubt, the requirements applicable to **Synchronous Power Generating Modules** also apply to **Synchronous Electricity Storage Modules** and the requirements applicable to **Power Park Modules** apply to **Non-Synchronous Electricity Storage Modules**. In addition, the requirements applicable to **Electricity Storage Modules** also apply irrespective of whether the **Electricity Storage Module** operates in such a mode as to import or export power from the **Total System**.

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ECC.6.3.3 OUTPUT POWER WITH FALLING FREQUENCY

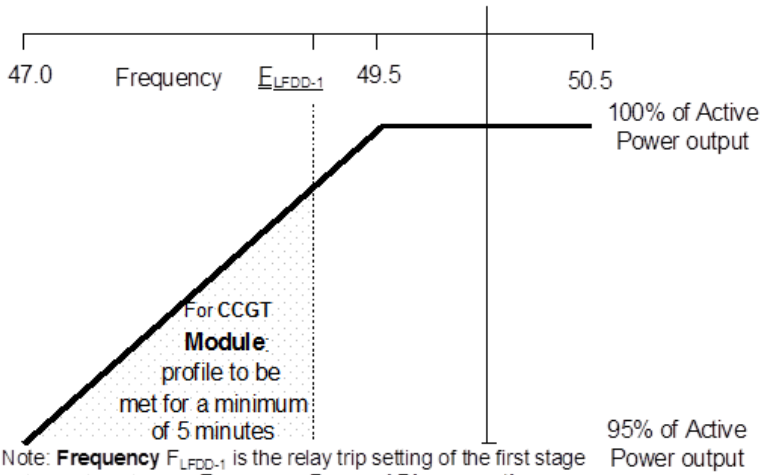
ECC.6.3.3.1 Output power with falling frequency for **Power Generating Modules** and **HVDC Equipment**

ECC.6.3.3.1.1 Each **Power Generating Module** and **HVDC Equipment** must be capable of:

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

(b) (subject to the provisions of ECC.6.1.2) maintaining its **Active Power** output at a level not lower than the figure determined by the linear relationship shown in Figure ECC.6.3.3(a) for **System Frequency** changes within the range 49.5 to 47 Hz for all ambient temperatures up to and including 25^0C, such that if the **System Frequency** drops to 47 Hz the **Active Power** output does not decrease by more than 5%. In the case of a **CCGT Module**, the above requirement shall be retained down to the **Low Frequency Relay** trip setting of 48.8 Hz, which reflects the first stage of the Automatic Low **Frequency Demand Disconnection** scheme notified to **Network Operators** under OC6.6.2. For **System Frequency** below that setting, the existing requirement shall be retained for a minimum period of 5 minutes while **System Frequency** remains below that setting, and special measure(s) that may be required to meet this requirement shall be kept in service during this period. After that 5 minutes period, if **System Frequency** remains below that setting, the special measure(s) must be discontinued if there is a materially increased risk of the **Gas Turbine** tripping. The need for special measure(s) is linked to the inherent **Gas Turbine Active Power** output reduction caused by reduced shaft speed due to falling **System Frequency**. Where the need for special measures is identified in order to maintain output in line with the level identified in Figure ECC.6.3.3(a) these measures should be still continued at ambient temperatures above 25^0C maintaining as much of the **Active Power** achievable within the capability of the plant. For the avoidance of doubt, **Generators** in respect of **Pumped Storage Plant** and **Electricity Storage Modules** shall also be required to satisfy the requirements of OC6.6.6.

Figure ECC.6.3.3(a) **Active Power** Output with falling frequency for **Power Generating Modules** and **HVDC Systems** and **Electricity Storage Modules** when operating in an exporting mode of operation



Note: **Frequency** F_{LFDD-1} is the relay trip setting of the first stage of the Automatic Low **Frequency Demand Disconnection** Scheme

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ECC.6.5.4.4 Where **Control Telephony** or **System Telephony** is installed, routine testing of such facilities may be required by **The Company** (not normally more than once in any calendar month). The **User** and **The Company** shall use reasonable endeavours to agree a test programme and where **The Company** requests the assistance of the **User** in performing the agreed test programme the **User** shall provide such assistance. **The Company** requires the **EU Code User** to test the backup power supplies feeding its **Control Telephony** facilities at least once every 5 years.

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Extracts from Demand Response Services Code (DRSC))

DRSC.1 INTRODUCTION

DRSC.1.1 The **Demand Response Services Code** is concerned with **Demand Response Providers** who contract with **The Company** for the provision of **Ancillary Services**.

DRSC.1.2 **Ancillary Services** are non-mandatory services used by **The Company** in operating the **System**. They are provided by **Demand Response Providers** with payment being dealt with under the terms of the relevant agreement for the **Ancillary Service**.

DRSC.1.3 Where a **Demand Response Provider** is interested in offering an **Ancillary Service** to **The Company**, then further details and additional information of the **Ancillary Services** are available from the Balancing Services section of the **Website**.

DRSC.1.4 Where **The Company** and a **Demand Response Provider** enter into an **Ancillary Services** agreement, it shall be in accordance with **Transmission Licence** condition C16 and the **Standard Contract Terms**.

DRSC 1.5 **The Demand Response Services Code** which would form part of an **Ancillary Services** agreement between a **Demand Response Provider** and **The Company** nd to discharge the obligations under **European Regulation (EU) 2016/1388**. The **Ancillary Services** agreement will include an obligation on the **Demand Response Provider** to satisfy the applicable requirements of this **Demand Response Services Code**.

DRSC.1.6 The **Demand Response Code** applies only to **Demand Response Providers** who have entered into an agreement with **The Company** to provide an **Ancillary Service**. This **Demand Response Services Code** does not apply to **Users** who are not **Demand Response Providers**.

DRSC.1.7 For the avoidance of doubt, **Network Operators** and **Non Embedded Customers** in respect of **EU Grid Supply Points** are required to satisfy the compliance requirements in section DRSC.11 of this code in addition to the **European Compliance Processes** only if they are also a **Demand Response Provider** ~~unless they are also a **Demand Response Provider**~~.

DRSC.2 OBJECTIVE

The objectives of the **DRSC** are to

DRSC.2.1 Ensure the obligations of **European Regulation (EU) 2016/1388** have been discharged; and

DRSC.2.2 Complement the requirements of the **Ancillary Services** agreement between **The Company** and a **Demand Response Provider**; and

DRSC.2.3 Define the minimum technical and compliance requirements **Demand Response Providers** are required to satisfy if they provide a **Demand Response Service** to **The Company** under an **Ancillary Services** agreement.

DRSC.3 SCOPE

DRSC.3.1 The **DRSC** applies to any **Demand Response Provider** who has entered into an agreement to provide **Ancillary Services** with **The Company**.

DRSC.3.2 The **DRSC** does not apply to **Users**, **BM Participants** or other parties ~~who are not~~ unless they are also a **Demand Response Provider**~~s~~.

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DRSC.11.7 Additional Testing requirements for Network Operators, Non-Embedded Customers and BM Participants who are also Demand Response Providers

DRSC.11.7.1 **Network Operators**, **Non-Embedded Customers** and **BM Participants** who are also **Demand Response Providers** shall be required to execute a demand modification test after two consecutive unsuccessful responses in the operational environment or at least every year as agreed with **The Company**.

DRSC.11.7.2 Each **Network Operator**, **Non-Embedded Customer** and **BM Participant** who are also **Demand Response Providers** and provide demand response low frequency demand disconnection shall execute a low frequency demand disconnection test at least once every three years.

Extracts from European Compliance Processes (ECPs)

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ECP.A.8.9 Testing of Low Frequency Demand Disconnection schemes

ECP.A.8.9.1 Each **Non-Embedded Customer** shall execute a low frequency demand disconnection test at least once every three years.

ECP.A.8.9.2 Each **Network Operator** shall execute testing on its low frequency demand disconnection relays installed within its network at least once every three years.

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Extracts from OC5

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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. Any test conducted shall not place the **User's Plant** and **Apparatus** at risk or endanger the operational security of the **National Electricity Transmission System**. In addition, the test shall be conducted in a way which minimises the impact on other **Users** of the **National Electricity Transmission System**.

OC5.5.4 Test 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 G5/4.
	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.6.2.2.2.2(a), CC.6.2.3.1.1(a), ECC.6.2.2.2.2(a), ECC.6.2.3.1.1(a), **Bilateral Agreement**
	Back Up Protection	CC.6.2.2.2.2(b), CC.6.2.3.1.1(b), ECC.6.2.2.2.2(a), ECC.6.2.3.1.1(a), **Bilateral Agreement**
	Circuit Breaker Fail **Protection**	CC.6.2.2.2.2(c), CC.6.2.3.1.1(c), ECC.6.2.2.2.2(c), ECC.6.2.3.1.1(c)

Parameter to be Tested		Criteria against which the test results will be assessed by The Company.
	Reactive Capability	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**. 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 ±5% of the reactive capability registered with **The Company** under **OC2**. the duration of the test will be for a period of upto 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 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. Measurements of the **Reactive Power** output under steady state conditions should be consistent with Grid Code requirements i.e. fully available within the voltage range ±5% at 400kV, 275kV and 132kV and lower voltages.
Governor / Frequency Control	Primary Secondary and High **Frequency** Response	**Ancillary Services Agreement**, CC.6.3.7 and where applicable CC.A.3 or ECC.6.3.7 and where applicable ECC.A.3. For a test initiated under OC.5.5.1.1 the measured response in MW/Hz is within ±5% of the level of response specified in the **Ancillary Services Agreement** for that **Genset**.
	Stability with Voltage	CC.6.3.4 or ECC.6.3.4

Parameter to be Tested		Criteria against which the test results will be assessed by The Company.
	Governor / Load / **Frequency** Controller **System** Compliance	CC.6.3.6(a), CC.6.3.7, CC.6.3.9, CC8.1, 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 ±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 25ºC., BC3.5.1
	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**, **QPN**, **Joint BM Unit Data** and **Dynamic Parameters**	BC2 The **Export and Import Limits**, **QPN**, **Joint BM Unit Data** and **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**.

Parameter to be Tested		Criteria against which the test results will be assessed by The Company.
	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**, **Network Operators** 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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OC5.7 BLACK START TESTING

OC5.7.1 General

(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**. This could where agreed include the requirement for a **Generator** to demonstrate that its **Generating Units**, **Power Park Modules** or **Power Generating Modules** within a **Black Start Station**, are capable of delivering a quick re-sycnhronisation service through executing a trip to house load test. Such a test would be assessed against the requirements of the **Black Start Contract** and/or the requirements of ECC.6.3.5.6. The quick re-synchronisation test would generally only be required where the **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.

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Extracts from OC6

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OC6.6.2 (d) Each **Network Operator** will notify **The Company** in writing by calendar week 24 each year of the details of the automatic low **Frequency Disconnection** on its **User System**. The information provided should identify, for each **Grid Supply Point** at the date and time of the annual peak of the **National Electricity Transmission System Demand** at **Annual ACS Conditions** (as notified pursuant to OC1.4.2), the frequency settings at which **Demand Disconnection** will be initiated and amount of **Demand** and **Netted Demand** disconnected at each such setting.

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OC6.6.6 (a) **Non-Embedded Customers**, ~~and~~ **Generators** in respect of **Electricity Storage Modules** and **Pumped Storage Generators**, must provide automatic low **Frequency** disconnection, which will be split into discrete blocks.

(b) The number and size of blocks and the associated low **Frequency** settings will be as specified by **The Company** by week 24 each calendar year following discussion with the **Non-Embedded Customers**, **Pumped Storage Generators** and **Generators** in respect of **Electricity Storage Modules** in accordance with the relevant **Bilateral Agreement**.

Commented [J(A1]: Note - this text also needs changing in respect of GC0096

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Extracts from OC9

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OC.9.2. OBJECTIVE

The overall objectives of OC9 are:…….

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**

(ii) Expand **Power Islands** to supply **Power Stations**

(iii) Expand and merge **Power Islands** leading to **Total System** energisation

(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**.

(vii) Information supply relating to issues such as, but not limited to

(a) The status of **Plant** and **Apparatus**

(b) Operational limits

(c) **Power Station** outputs

(d) Time critical processes

(e) The state of the **National Electricity Transmission System**

(f) Status information (as necessary) such as **Active Power** output, **Reactive Power** Output, **Block Load Capability**, tap and circuit breaker positions,

~~(a)~~(g) **Emdedded Power Station** data where such data is not visible to the **Network Operator**

(viii) Instructions to **User's** including **Generators**, **HVDC System Owners**, **DC Converter Station Owners**, **Interconnectors**, **Network Operators** and **Non-Embedded Customers**.

Annex 2 – Mapping for Emergency & Restoration Networks Code

This has been uploaded separately to the modification area for GC0127 and GC0128

Annex 3 – Attendance log

Key

A – Attended

X – Absent

O – Alternate

D – Dial-in

Name	Organisation	Role	29/05/2019	13/06/2019	02/07/2019	03//2019	19/07/019
Paul Mullen	Code Administrator, NG Electricity System Operator	Chair	A	A	A	A	X
Chrissie Brown	Code Administrator, NG Electricity System Operator	Technical Secretary	A	A	A	A	A
Antony Johnson	National Grid Electricity System Operator	Proposer/Workgroup member	A	A	A	A	A
Mark Jones	National Grid Electricity System Operator	Subject matter expert	A	A	A	A	D

Alastair Frew	Drax Generation Enterprise Ltd	Workgroup member	A	D	A	A	D
Garth Graham	SSE Generation Limited	Workgroup member	A	D	D	A	D
Andy Colley	SSE Generation Limited	Alternate Workgroup member	X	D Part meeting	X	A	X
Paul Crolla	Scottish Power Renewables	Workgroup member	A	A	A	A	D
Grant McBeath	SP Energy Networks	Workgroup member	X	X	X	X	D
Graeme Vincent	SP Energy Networks	Alternate Workgroup member	D	A	A	A	X
Richard Wilson		Workgroup member	X	X	A	X	X

Annex 4 – Draft legal text

