EU NCER: System Restoration Plan

Issue 3

November 2019

Contents

EU NCER: System Restoration Plan

1 Introduction

The European Network Code on Emergency & Restoration[1] (EU NCER) came into force on 18 December 2017. Pursuant to the provisions in Chapter 3 below is the proposed System Restoration Plan.

As provided for in the EU NCER Article 23, this System Restoration Plan will be designed in consultation with Stakeholders in the GB synchronous area. GB Parties who will be required to comply with the requirements of the EU NCER are detailed in Appendix A of this System Restoration Plan. They will be notified in writing during the Autumn of 2019 together with the changes which are being introduced through Grid Code modification GC0127 and GC0128. In general, the EU NCER will apply to the following parties in GB.

- Any Party with a CUSC Contract
- Transmission Licensees
- Distribution Network Operators

This Plan is not intended to replace any provisions currently in place in the GB Codes nor to amend the Operational Security Limits[2], it is a summary of how the requirements for System Restoration specified in EU NCER will be satisfied in GB. Many of the provisions contained within this System Restoration Plan are already described in the GB national codes (e.g. Grid Code, CUSC, STC, BSC, etc.). Where there are new mandatory requirements for GB Parties then these will be included in relevant GB Codes as appropriate.

This System Restoration Plan will impact all parties identified in Appendix A who have code obligations referred to in this plan.

In complying with the requirements of the Grid Code, System Operator Transmission Owner Code (STC), Distribution Code and Balancing and Settlement Code (BSC) (as applicable), the National Grid Electricity System Operator (NGESO), Transmission Licensees, Distribution Network Operators (including Independent Distribution Network Operators) and CUSC Parties would be considered to satisfy the requirements of EU NCER. It should be noted that the EU NCER applies both to GB Code Users and EU Code Users.

This System Restoration Plan has been developed taking the following into account:

– The behaviour and capabilities of load and generation
– The specific needs of the high priority users detailed in Appendix B

---

[1] *Network Code on Emergency and Restoration*
http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2017.312.01.0054.01.ENG&toc=OJ:L:2017:312:TOC

[2] *Article 25 System Operations Guideline*
http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2017.220.01.0001.01.ENG

– The characteristics of the National Electricity Transmission System and Distribution Network Operators (including Independent Distribution Network Operators (IDNO)) systems.

In addition, and as required under the EU NCER, the NGESO will notify (in writing, during the Autumn of 2019) those parties who would be within the scope of the NCER and any measures they need to take. These parties are defined in Table A1 of Appendix A of this document and would include Transmission Licensees, Network Operators (including Independent Distribution Network Operators) and CUSC Parties. The additional measures upon CUSC parties will be included through Grid Code modification GC0127 and GC0128 with measures upon Transmission Licensees being developed through updates to the System Operator Transmission Owner Code (STC).

2 System Restoration Plan Overview

The EU Network Code on Emergency and Restoration (EU NCER) aims to ensure security and continuity of electricity supply across Europe by creating harmonised standards and procedures to be applied in the Emergency, Blackout and Restoration system state(s). This code requires the development of a System Restoration Plan in advance of such an event specifying measures related to information exchange, operational procedures and post-event analysis.

EU NCER sits alongside the Transmission System Operation Guideline[3] (SOGL) which sets out harmonised rules on system operation and identifies different critical system states (Normal State, Alert State, Emergency State, Blackout State and Restoration).

This System Restoration Plan consists of the technical and organisational measures necessary for the restoration of the electricity system in Great Britain from a Partial or Total Shutdown to normal steady state conditions, taking into account the capabilities of the GB parties listed in Table 1 of Appendix A of this document and the operational constraints of the Total System.

The main objectives of this plan include:

1. To achieve the Re-Synchronisation of parts of the Total System which have become Out of Synchronism.
2. To ensure that communication routes and arrangements are available to enable representatives of those parties who fall within the scope of the NCER as identified in Appendix A of this System Restoration Plan are authorised to make binding decisions on their behalf and to communicate with each other when this System Restoration Plan is active.
3. To describe the role that in respect of the GB Parties listed in Appendix A may have in the restoration processes as detailed in the relevant De-Synchronised Island Procedures (DIPs) and Local Joint Restoration Plans (LJRPs).
4. To identify and address as far as possible the events and processes necessary to enable the restoration of the Total System in GB to a Normal State, 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:

    - Selectively implement Local Joint Restoration Plans;
    - Expand Power Islands to supply non Black Start Power Stations;
    - Selectively reconnect demand;
    - Expand and merge Power Islands leading to Total System energisation;

[3] *https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R1485&from=EN*

- Facilitate and co-ordinate returning the Total System back to normal operation; and
- Resumption of the market arrangements if suspended in accordance with the relevant codes.

2.1 Activation of System Restoration Plan

In Accordance with EU NCER Article 25

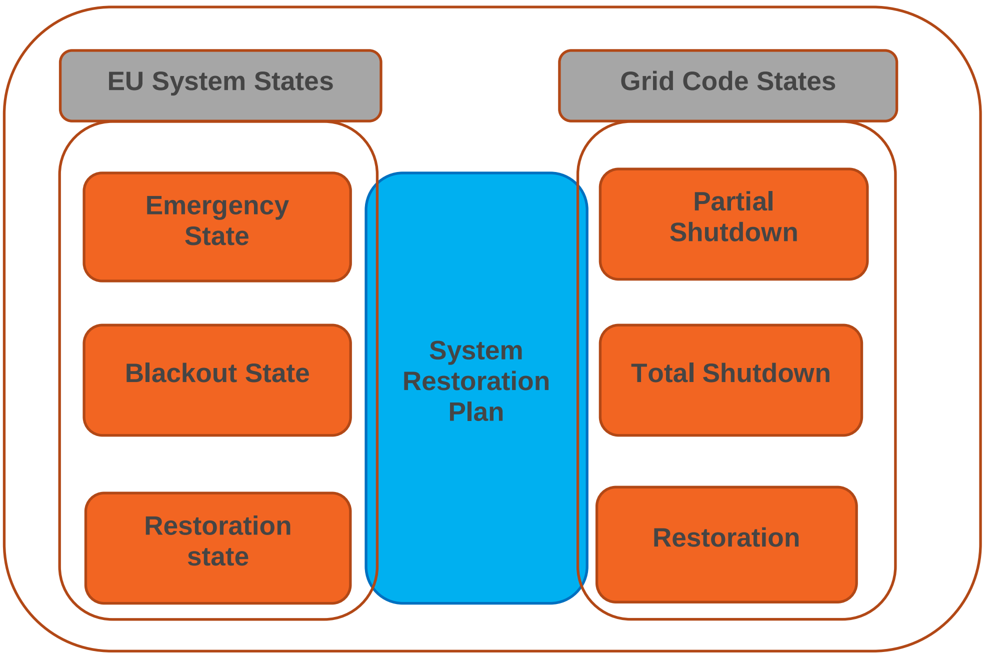
2.1.1 Procedures in this System Restoration Plan can be activated when the System is in an Emergency state and activated procedures of the System Defence Plan have taken place, or will be activated when the System is in the Blackout state.

2.1.2 Procedures in this System Restoration Plan will be activated by the NGESO in coordination with the GB Parties listed in Appendix A of this System Restoration Plan.

2.1.3 All instructions issued by the NGESO under this System Restoration Plan must be executed by each GB party falling under the scope of the NCER (as identified in Appendix A of this System Restoration Plan) without undue delay.

2.1.4 The NGESO will also manage remedial actions that involve actions from other Transmission Licensees and Externally Interconnected System Operators (EISOs).

2.1.5 The System Restoration Plan can be activated, and remain active, through the Emergency, Blackout and Restoration states as shown below.



2.1.6 Activation of the System Restoration Plan in GB will occur once the NGESO determines and informs the Balancing and Settlement Code Company (BSCCo) that either a Total Shutdown or a Partial Shutdown exists and subsequent Black Start instructions are required for restoration.

2.1.7 Market Suspension (*EU NCER Article 35 part 1*) occurs in GB

- Automatically in the event of a Total Shutdown (in this case the Market Suspension Threshold is not relevant).
- During a Partial Shutdown and in this case the market is only suspended if the Market Suspension Threshold is met. There are three circumstances in which the threshold can be met or deemed to be met.
    - the NGESO determines that the spot time Initial National Demand Out-Turn is equal to or lower than 95% of the baseline forecast (this means that 5% or more of demand has been lost); or
    - No more baseline forecast data is available to the NGESO; or
    - 72 hours have elapsed since the Partial Shutdown commenced

2.1.8 The trigger threshold for the GB system Blackout State shall be maintained as per the current definition of a Partial or a Total System Shutdown as defined in *Grid Code OC9.4.1*.

3 System Restoration Plan Procedures

Grid Code OC9.4. documents the procedure of recovery from a Total or Partial Shutdown. This allows for a top-down restoration approach (energisation from other Transmission Licensees and Externally Interconnected System Operators (EISOs)) and a bottom-up energisation approach (energisation from within a Transmission Licensees area). In GB, the more common approach is the bottom up approach but this does not prevent elements of a top down approach from also being utilised. Detailed within this are the specific procedures referenced in EU NCER as:

- Re-energisation procedure *(EU NCER Article 26 Section 2)*
- Re-synchronisation procedure *(EU NCER Article 33 Section 4)*
- Frequency management procedure

3.1 Re-energisation procedure

3.1.1 The *Grid Code OC9.2.5* identifies the key processes to be implemented in GB to enable the restoration of the Total System following a Total or Partial Shutdown as:

- Selectively implement Local Joint Restoration Plans;
- Expand Power Islands to supply Power Stations;
- Selectively reconnect Demand;
- Expand and merge Power Islands leading to Total System energisation;
- Facilitate and co-ordinate returning the Total System back to normal operation; and
- Resumption of the Balancing Mechanism if suspended in accordance with the provisions of the Balancing and Settlement Code (BSC).

3.1.2 In order to deliver this restoration, contractual arrangements for Black Start Service Providers and documented restoration plans are in place as permitted through the *Grid Code OC9* provisions.

3.1.3 The bilateral procurement of Black Start service provision is carried out by the NGESO. Following a commercial contract being established and commenced, the NGESO in coordination with relevant Transmission Licensees, Distribution Network Operators (including Independent Distribution Network Operators (IDNOs) and CUSC Parties create, in line with *Grid Code OC9.4.7.12*, a Local Joint Restoration Plan (LJRP).

3.1.4 Operation of these LJRPs follows *Grid Code OC9.4.7.6*. Each individual LJRP document provides specific details of how individual Power Stations are to be started and block loaded to create a stable Power Island. In co-ordination with the NGESO these plans provide guidance to Transmission Licensees to assess the status of operational equipment and systems, within a shutdown situation, and identify the organisational and process changes necessary to enable an effective restoration. They also identify the split in responsibilities between the relevant Transmission Licensees and relevant Distribution Network Operators (including Independent Distribution Network Operators), together with the appropriate communication channels.

3.1.5 Changes, amendments and the creation of new LJRPs is detailed in *Grid Code OC9.4.7.12* including the exercising of these plans.

3.1.6 In the LJRP stage of restoration, voltage and frequency management is overseen by the NGESO unless delegated to the relevant Transmission Licensee in accordance with the provisions of the STC. Once an additional party (such as a Generator or Distribution Network Operator) is involved in the Power Island the voltage and frequency management control reverts to the NGESO. At this point the NGESO directs the relevant TSO to expand the network in line with routes identified in the Skeleton Network.

3.1.7 The Skeleton Network indicates key routes for growing individual power islands, once stable and having developed a level of circuit security, to enable supplies to be given to further GB Parties, other Power Islands and subsequently to create a single, synchronous power system.

3.1.8 During the re-energisation process the resynchronisation and frequency management procedures detailed within this System Restoration Plan are adhered to.

3.2 Re-synchronisation procedure

3.2.1 EU NCER Article 33 Section 4 requires the appointment of a resynchronisation leader. For the purpose of GB National Electricity Transmission System restoration, the NGESO takes on the role of resynchronisation leader, as overall coordinator of the restoration procedure unless alternative arrangements are specified (as currently exist in Scotland under STCP 06-1 - the System Operator Transmission Owner Code Procedure on Black Start). *Grid Code OC9.5.6* outlines the requirements for the Re-synchronisation of De-Synchronised Islands following a Total or Partial Shutdown.

3.2.2 Following any shutdown, the re-energisation procedure requires that several Power Islands are created and expanded with the objective of creating the Skeleton Network to grow to reach available generation and demand. The Skeleton Network is then expanded until all demand, generation and appropriate circuits have been restored. It will, therefore, be necessary to interconnect Power Islands. The complexities and uncertainties of recovery from a Total or Partial Shutdown requires that provisions under this section to be flexible, however, the actions taken when Re-synchronising De-synchronised Islands following any Total Shutdown or Partial Shutdown, will include the following: (a) the provision of supplies to appropriate Power Stations to facilitate their synchronisation as soon as practicable; (b) energisation of a skeletal National Electricity Transmission System; and (c) the strategic restoration of Demand in co-ordination with relevant Distribution Network Operators (including Independent Distribution Network Operators.

3.2.3 Re–synchronisation of a Power Island is performed by arming and closing a synchronising breaker at the substation joining both Power Islands. The Power System Synchroniser setting is in place to ensure safe closure of the open circuit breaker which is live on both sides. This is designed to synchronise two electrically separate systems which are running at slightly different frequencies with the two voltages across the open circuit breaker contacts cyclically passing in and out of phase with each other.

3.2.4 The requirement for the Power System Synchroniser is to ensure the phase angle between voltages is practically zero and the voltage magnitudes and difference in frequency or slip is within pre-set limits. Once the synchronisation command has been executed, the Power System Synchroniser circuit breaker will remain armed for a period of time to allow system conditions to be suitably altered (one frequency driven towards the other by issuing Target Frequency instructions to generators within one power island) to allow the synchronising relay to close the selected circuit breaker. Should the conditions not be met, then the instruction will time out and circuit breaker re-selection and execution of the instruction must be repeated.

3.2.5 The location of Power System Synchroniser circuit breaker facilities are documented within the relevant TSO's internal procedures and are indicated on NGESO's situational awareness displays at the Electricity National Control Centre.

3.2.6 The setting policy for synchronising relays is common across all three onshore TSO areas in GB, and are:

System synchronising slip 0.125Hz

System synchronising closing angle 10deg

Under voltage setting 0.85pu

Voltage difference limit as specified in CC/ECC6.1.4 of the Grid Code.

3.2.7 During a Total Shutdown or Partial Shutdown and during the subsequent recovery, the (Transmission) Licence Standards may not apply and the Total System may be operated outside normal Voltage and Frequency standards.

3.2.8 In a Total Shutdown and during the subsequent recovery, all instructions issued by the relevant TSO (unless specified otherwise) are deemed to be Emergency Instructions under *BC2.9.2.2 (iii)* and need not be prefixed with the words "This is an Emergency Instruction".

3.2.9 In a Partial Shutdown and during the subsequent recovery, all instructions issued by the NGESO and relevant Transmission Licensees to relevant GB Parties (as defined in Table A1 of Appendix A of this document) which are part of an invoked LJRP (unless specified otherwise) are deemed to be Emergency Instructions under *BC2.9.2.2(iii)* and need not be prefixed with the words “This is an Emergency Instruction”.

3.3 Frequency management procedure

3.3.1 EU NCER Section 3 Article 29 requires the appointment of a frequency leader during system restoration when a synchronous area is split in several synchronised regions. For the purpose of GB NETS restoration, the NGESO takes on the role of frequency leader except in situations where it is delegated in Scotland in accordance with STCP-06-1.

3.3.2 Frequency management during system restoration falls into two phases; the LJRP phase and the Skeleton Network phase. The NGESO remains the frequency leader in both these phases (unless the role, as currently provided for in Scotland, has been delegated to another Transmission Licensee as defined under STCP-06-1) and both phases can be in force simultaneously as new LJRPs are instructed and form power islands whilst the Skeleton Network is being restored.

3.3.3 Frequency Management during LJRP Phase

During the LJRP phase, the NGESO will instruct the implementation of required LJRPs and the required Target Frequency. As detailed within the LJRP; demand blocks will be added in line with the requirements of the relevant GB party to establish a power island. The relevant GB Party (for example a Generator or HVDC System Owner) will configure their plant to act in “free governor action” mode to aid in frequency control. During the period when only one GB Party (for example a Power Station or HVDC System Owner) is connected to the Power Island the frequency is controlled by that GB Party in co-ordination with the NGESO, relevant Transmission Licensee and or relevant Distribution Network Operator (including Independent Distribution Network Operators) who will also add or remove demand as the GB Party (eg a Generator or HVDC System Owner) requires to maintain Target Frequency.

During this period, A GB Party (such as a Power Station or HVDC System Owner) will be required to regulate their output in co-ordination with the NGESO and relevant Transmission Licensee and /or relevant Distribution Network Operator (including an Independent Distribution Network Operator) to the existing and newly connected demand in the Power Island. The NGESO in coordination with the relevant Transmission Licensee and /or relevant Distribution Network Operator (including will communicate so demand and generation are matched to maintain (where practicable) the Target

Frequency. Demand will be added to the Power Island as more generation becomes available.

3.3.4 Frequency Management during the Skeleton Network Phase

The Skeleton Network phase begins when a second or subsequent GB Parties (as defined in Table A1 of Appendix A) are added to the Power Island. The NGESO in coordination with the relevant Transmission Licensees and Distribution Network Operators (including Independent Distribution Network Operators) may issue new Target Frequency instructions to available Generators, HVDC System Owners, DC Converter Station Owners and Virtual Lead Parties of the size of power blocks required to be added or removed from the Power Island to maintain generation stability.

Power Islands will be synchronised to each other using suitable system synchroniser circuit breakers with the frequency of each Power Island being controlled by the NGESO in coordination with relevant Transmission Licensees.), Subsequent Power Island will be synchronised in a similar way.

The NGESO in coordination with the relevant Transmission Licensee will determine power block size to be added or removed from the power island to maintain energy balancing and power island frequency. GB Parties defined in Table A1 of Appendix A of this System Restoration Plan who are capable of suppling Power to the National Electricity Transmission System will be instructed by the NGESO unless delegated through STCP 06-1. All Power Stations who resume operation in a Restoration State will remain in Frequency Sensitive Mode until Normal State is achieved, or instructed otherwise by the NGESO.

4 System Restoration to Normal State operation

4.1 In GB, a Black Start restoration will be deemed to be completed according to the rules of the Grid Code and the BSC. In essence, this is as follows:

- If normal market operations have been suspended, then a Black Start restoration will be deemed to be completed when these operations (including the Balancing Mechanism) have resumed – with this point to be determined by the BSC Panel; or

- If normal market operations have not been suspended, then a Black Start restoration will be deemed to be completed when the NGESO determines that the Total System has returned to normal operation.

4.2 *Grid Code OC9.4.7.9* describes the considerations to be made by NGESO before declaring that the Total System could return to normal operation:

- the extent to which the GB NETS is contiguous and energised;
- the integrity and stability of the GB NETS and its ability to operate in accordance with the (Transmission) Licence Standards;
- the impact that returning to a Normal State may have on transmission constraints and the corresponding ability to maximise the Demand connected;
- the volume of Generation or Demand not connected to the GB NETS; and
- the functionality of normal communication systems (i.e. electronic data communication facilities, Control Telephony, etc.).

4.3 Once NGESO deems that sufficient confidence in the Transmission System, connected generation and demand and appropriate systems are in place to return to normal operation they will inform the BSCCo of this development.

5 System Restoration Plan Implementation

5.1 Article 24 of the EU NCER, provides for the implementation of the **System Restoration Plan** and requires that by the 18 December 2018 the NGESO will notify all GB Parties who are within the scope of the EU NCER. In December 2018, the NGESO prepared a draft System Defence and System Restoration Plan, and on the basis of minimal change, the NGESO considered this would be sufficient to notify GB parties of the obligations they have to meet. Since publication of these draft documents Stakeholders have requested further clarifications of the parties affected by the NCER but more importantly formal notification of who is within the scope of the NCER and what measures they have to meet. As detailed in section 1 of this System Restoration Plan, The NGESO will notify (in writing) those GB Parties (who fall within the criteria listed in Table A1 of Appendix A) that they will fall within the scope of the NCER and the additional measures they have to meet. It is acknowledged that Parties affected by the EU NCER have a year to implement the measures and now that we are within the 1 year window to the 18 December 2019 there is a risk they may struggle to meet the requirements of the EU NCER and the subsequent Grid Code and STC obligations that are being introduced. That said, the additional measures are minor as proposed in GC0127/128. By already complying with the Grid Code and STC the majority of these measures are already met by GB Parties. Through the Grid Code and STC consultation processes, we will continue to work with Stakeholders on any areas which will cause difficulties for them post the 18th December 2019.

5.2 This System Restoration Plan will be fully implemented by 18 December 2019.

6 RESILIENCE MEASURES TO BE IMPLEMENTED BY THE NGESO, TRANSMISSION LICENSEES AND DISTRIBUTION NETWORK OPERATORS (INCLUDING INDEPENDENT DISTRIBUTION NETWORK OPERATORS)

In Accordance with EU NCER Article 11(4)

6.1 Substations identified in the System Restoration Plan Appendix D as essential for restoration will be operational in case of loss of primary power supply for at least 24 hours (EU NCER Article 42).

6.2 The NGESO, Onshore Transmission Licensees and Distribution Network Operators (including Independent Distribution Network Operators) must ensure all critical tools and facilities listed in SOGL Article 24 are designed to remain available for use for at least 24 hours in the case of a loss of external power (EU NCER Article 42). This includes any remote data centres required to sustain the critical tools and facilities.

6.2.1 Critical tools and facilities for the NGESO, Onshore Transmission Licensees and Distribution Network Operators (including Independent Distribution Network Operators) include but are not limited to Supervisory, Control and Data Acquisition systems (SCADA), protection systems and control telephony.

6.2.2 In addition to those listed in 6.2.1, critical tools and facilities for the NGESO will include state estimation applications, facilities for load-frequency control, security analysis and the means to facilitate cross-border market operations.

6.3 The NGESO and onshore TSOs must also ensure they have at least one geographically separate control room with backup power supply for at least 24 hours, in case of loss of primary power supply. They must also have a procedure to transfer functions to the Standby Control Room as quickly as possible but in no longer than 3 hours

7 Plan Review

7.1 EU NCER Article 51 requires the NGESO to review the measures of the System Restoration Plan using computer simulation tests to assess effectiveness at least every five years. Such a process will be documented and developed through internal NGESO procedures.

7.2 The review will cover:

- Simulating the establishment of the Skeleton Network using Black Start Service Providers;
- Demand reconnection process;
- Process for resynchronisation of Power Islands; and
- Learning from operational testing as per the testing procedure

7.3 Operational testing of the System Restoration Plan will be in line with the Assurance and Compliance Testing requirements within the System Defence Plan.

7.4 The NGESO will review the System Restoration Plan to assess its effectiveness at least every five years.

7.5 The NGESO will also review the relevant measures of the System Restoration Plan in advance of a substantial change to the configuration of the National Electricity Transmission System.

7.6 Any substantive changes identified in the review of the System Restoration Plan will be captured via published updates to this document.

Appendix A: GB Parties within the scope of the System Restoration Plan

In accordance with EU NCER, Art 2 defines the SGU's who fall within the scope of the European Emergency and Restoration Code. Table A1 defines the EU Criteria and how this translates to GB Parties including which of those parties are included within the scope of the EU Emergency and Restoration Code and those which are not.

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**
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: ECC6.1.2, ECC.6.1.4, ECC.6.2.2.2, ECC.6.3, ECC.6.5, ECC.8, ECC.A.3, ECC.A.4, ECC.A.6, ECC.A.7, ECC.A.8 ECP.A.3, ECP.A.5, ECP.A.6 OC5.4, OC5.5 OC.7.4, OC7.6 (OC7.6 - Scotland and Offshore only) OC9 OC10 OC12 BC1.4, BC1.5, BC.1.7, BC1.A.1, BC1.A.2.1 BC2 (in particular BC.2.9) BC3.3, BC3.4, BC3.5, BC.3.6, BC.3.7, 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.
		Any Generator who does not have a CUSC Contract (i.e. Embedded) and owns or operates a Power Station comprising one or more Type C or Type D Power Generating Modules	Not applicable. Under the current GB Framework, there is currently no requirement for Non-CUSC Parties who own or operate a Type C or Type D Power Generating Module to contribute to the System Defence Plan. This however is subject to review and the ESO expect to work with all Stakeholders in the future to consider the approach to including Non-CUSC Parties within the System Defence Plan.

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
	Existing	Any Generator who is a GB Code User who has a CUSC Contract with the ESO and owns or operates a Power Station comprising one or more Generating Units or Power Park Modules which i) have a maximum output of greater than 10MW but less than 50MW and connected below 110kV (equivalent to a Type C Power Generating Module) or ii) connected at 110kV or above or has a rated power output of 50MW or above (equivalent to a Type D Power Generating Module)	CC6.1.2, CC.6.1.3, CC.6.1.4, CC.6.2.2.2, CC.6.3, CC.6.5, CC.8, CC.A.3, CC.A.4, CC.A.6, CC.A.7 CP.A.3 OC5.4, OC5.5, OC5.A.1, OC.5.A.2, OC5.A.3 OC.7.4, OC7.6 (OC7.6 - Scotland and Offshore only) OC9 OC10 OC12 BC1.4, BC1.5, BC.1.7, BC1.A.1, BC1.A.2.1 BC2 (in particular BC.2.9) BC3.3, BC3.4, BC3.5, BC.3.6, BC.3.7, 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.
		Any Generator who does not have a CUSC Contract (i.e. Embedded) and owns or operates a Power Station comprising one or more Generating Units or Power Park Modules which i) have a maximum output of greater than 10MW but less than 50MW and connected below 110kV (equivalent to a Type C Power Generating Module) or ii) connected at 110kV or above or has a rated power output of 50MW or above (equivalent to a Type D Power Generating Module)	Not applicable. Under the current GB Framework, there is currently no requirement for Non-CUSC Parties who own and operate a Type C or Type D Power Generating Module to contribute to the System Defence Plan. This however is subject to review and the ESO expect to work with all Stakeholders in the future to consider the approach to including Non-CUSC Parties within the System Defence Plan.

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
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: ECC.6.1.2, ECC.6.1.4, ECC.6.2.2.2, ECC.6.3, ECC.6.4.3, ECC.6.5, ECC.8, ECC.A.3, ECC.A.4, ECC.A.6, ECC.A.7, ECC.A.8 ECP.A.3, ECP.A.5, ECP.A.6 OC5.4, OC5.5, OC.7.4, OC7.6 (OC7.6 - Scotland and Offshore only) OC9 OC10 OC12 BC1.4, BC1.5, BC1.7, BC1.A.1, BC1.A.2.1 BC2 (in particular BC.2.9) BC3.3, BC3.4, BC3.5, BC.3.6, BC.3.7, In satisfying the above Grid Code requirements, Generators with a CUSC Contract who own or operate a Type B Power Generating Module would meet one or more of the requirements of the System Defence Plan.
		Any Generator who does not have a CUSC Contract (i.e. Embedded) and owns or operates a Power Station comprising one or more Type B Power Generating Modules	Not applicable. Under the current GB Framework, there is currently no requirement for Non-CUSC Parties who own and operate a Type C or Type D Power Generating Module to contribute to the System Defence Plan. This however is subject to review and the ESO expect to work with all Stakeholders in the future to consider the approach to including Non-CUSC Parties within the System Defence Plan.

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
	Existing	Any Generator who is a GB Code User who has a CUSC Contract with the ESO and owns or operates a Power Station comprising one or more Generating Units or Power Park Modules which has a maximum output of greater than 1MW but less than 10MW and connected below 110kV (equivalent to a Type B Power Generating Module)	Applicable Grid Code requirements: CC6.1.2, CC.6.1.3, CC.6.1.4, CC.6.2.2.2, CC.6.3, CC.6.5, CC.8, CC.A.3, CC.A.4, CC.A.6, CC.A.7 CP.A.3 OC5.4, OC5.5, OC.5.A.1, OC.5.A.2, OC5.A.3 OC.7.4, OC7.6 (OC7.6 - Scotland and Offshore only) OC9 OC10 OC12 BC1.4, BC1.5, BC.1.7, BC1.A.1, BC1.A.2.1 BC2 (in particular BC.2.9) BC3.3, BC3.4, BC3.5, BC.3.6, BC.3.7, 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.
		Any Generator who does not have a CUSC Contract (ie Embedded) and owns or operates a Power Station comprising one or more Generating Units or Power Park Modules which have a maximum output of greater than 1MW but less than 10MW and connected below 110kV (equivalent to a Type B Power Generating Module).	Not applicable. Under the current GB Framework, there is currently no requirement for Non-CUSC Parties who own and operate a Type B Power Generating Module to contribute to the System Defence Plan. This however is subject to review and the ESO expect to work with all Stakeholders in the future to consider the approach to including Non-CUSC Parties within the System Defence Plan.
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. The requirement of the DRSC would also apply but only when the Demand Response Provider is also a CUSC Party.	Applicable Grid Code requirements: ECC6.1.2, ECC.6.1.4, ECC.6.2.3, ECC.6.5.. DRSC ECP.A.8

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
			OC1 OC5.4, OC5.5.4 (only in respect of CUSC Parties who are also Demand Response Providers). , OC6.8 OC.7.4, OC7.6 (OC7.6 - Scotland and Offshore only) OC9 OC10 OC12 BC1.4, BC1.5, BC.1.7, BC1.A.1, BC1.A.2.1 BC2 (in particular BC.2.9) In satisfying the above Grid Code requirements, Non-Embedded Customers would meet one or more of the requirements of the System Defence Plan. All Transmission Connected Demand Facilities would have to be BM and CUSC Parties and hence satisfy the requirements of the Emergency and Restoration Code. There is no concept of an Embedded Non-Embedded Customer.
	Existing	Any Non-Embedded Customer who is a GB Code User and has a CUSC Contract with the ESO	Applicable Grid Code requirements: CC6.1.2, CC.6.1.3, CC.6.1.4, CC.6.2.3, CC.6.5, . OC1 OC5.4, OC5.5.4 (only in respect of CUSC Parties who are also Demand Response Providers). OC6.8 OC.7.4, OC7.6 (OC7.6 - Scotland and Offshore only) OC9 OC10 OC12 BC1.4, BC1.5, BC.1.7, BC1.A.1, BC1.A.2.1 BC2 (in particular BC.2.9)

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
			In satisfying the above Grid Code requirements, Non-Embedded Customers would meet one or more of the requirements of the System Defence Plan. All Transmission Connected Demand Facilities would have to be BM and CUSC Parties and hence satisfy the requirements of the Emergency and Restoration Code. There is no concept of an Embedded Non-Embedded Customer.
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: ECC6.1.2, ECC.6.1.4, ECC.6.2.3, ECC.6.5. DRSC ECP.A.8 OC1 OC5.4, OC5.5.4 (only in respect of CUSC Parties who are also Demand Response Providers). OC6.8 OC.7.4, OC7.6 (OC7.6 - Scotland and Offshore only) OC9 OC10 OC12 BC1.4, BC1.5, BC.1.7, BC1.A.1, BC1.A.2.1 BC2 (in particular BC.2.9) BC3 In satisfying the above Grid Code requirements, Non-Embedded Customers (which would include a Closed Distribution System), would meet one or more of the requirements of the System Defence Plan. All Transmission Connected Closed Distribution Systems would have to be BM and CUSC Parties and hence satisfy the requirements of the Emergency and Restoration Code.

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
			There is no concept of a Transmission Connected Non CUSC Party
	Existing	Any Non-Embedded Customer who is a GB Code User and which has a CUSC Contract with the ESO	Applicable Grid Code requirements: CC6.1.2, CC.6.1.3, CC.6.1.4, CC.6.2.3, CC.6.5. OC1 OC5.4, OC5.5.4 (only in respect of CUSC Parties who are also Demand Response Providers). OC6.8 OC.7.4, OC7.6 (OC7.6 - Scotland and Offshore only) OC9 OC10 OC12 BC1.4, BC1.5, BC.1.7, BC1.A.1, BC1.A.2.1 BC2 (in particular BC.2.9) In satisfying the above Grid Code requirements, Non-Embedded Customers would meet one or more of the requirements of the System Defence Plan. All Transmission Connected Demand Facilities would have to be BM and CUSC Parties (which would include Closed Distribution Systems) and hence satisfy the requirements of the Emergency and Restoration Code. There is no concept of an Embedded Non-Embedded Customer.

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
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 including Virtual Lead Parties.	(ECC/CC 6.5 only) DRSC if they are also providing Demand Response Services and their equipment was purchased on or after 7 September 2019 and connected to the System on or after 18 August 2019. BC1.4, BC1.5, BC.1.7, BC1.A.1, BC1.A.2.1 BC2 (in particular BC.2.9) BC3.3, BC3.4, BC3.5, BC.3.6, BC.3.7 (As applicable but biased towards Generator who are registered as Gensets).
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: ECC6.1.2, ECC.6.1.4, ECC.6.2.2.2, ECC.6.3, ECC.6.5, ECC.8, ECC.A.3, ECC.A.4, ECC.A.6, ECC.A.7, ECC.A.8 ECP.A.3, ECP.A.7 OC5.4, OC5.5 OC.7.4, OC7.6 (OC7.6 - Scotland and Offshore only) OC9 OC10 OC12 BC1.4, BC1.5, BC.1.7, BC1.A.1, BC1.A.2.1 BC2 (in particular BC.2.9) BC3.3, BC3.4, BC3.5, BC.3.6, BC.3.7, In satisfying the above Grid Code requirements, HVDC System Owners with a CUSC Contract who own or operate an HVDC System. DC Power Park Modules would need to satisfy the same Grid Code requirements as those 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
			to new Type C and Type D Power Generating Modules listed in the first row of this table.
		Any HVDC System Owner who does not have a CUSC Contract would not be required to satisfy the requirements of the EU Emergency and Restoration Code.	Not applicable. Under the current GB Framework, there is currently no requirement for Non-CUSC Parties who own or operate a DC Converter Station to contribute to the System Defence Plan. An HVDC System does have a specific meaning within the scope of the Grid Code and would therefore be within the scope of EU NCER. This however is subject to review and the ESO expect to work with all Stakeholders in the future to consider the approach to including Non-CUSC Parties within the System Defence Plan.
	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: CC6.1.2, CC.6.1.3, CC.6.1.4, CC.6.2.2.2, CC.6.3, CC.6.5, CC.8, CC.A.3, ECC.A.4, CC.A.6, CC.A.7, CC.A.8 CP.A.3 OC5.4, OC5.5, OC5.A.4 OC.7.4, OC7.6 (OC7.6 - Scotland and Offshore only) OC9 OC10 OC12 BC1.4, BC1.5, BC.1.7, BC1.A.1, BC1.A.2.1 BC2 (in particular BC.2.9) BC3.3, BC3.4, BC3.5, BC.3.6, BC.3.7, In satisfying the above Grid Code requirements, DC Converter Station Owners with a CUSC Contract who own or operate a DC Converter Station would be required to satisfy

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
			the requirements of EU NCER. DC Power Park Modules would need to satisfy the same Grid Code requirements as those applicable to Existing Generators listed in the second row of this table.

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
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 pursuant to Article 4(4)	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: ECC6.1.2, ECC.6.1.4, ECC.6.2.2.2, ECC.6.3, ECC.6.5, ECC.8, ECC.A.3, ECC.A.4, ECC.A.6, ECC.A.7, ECC.A.8 DRSC if they are also providing Demand Response Services and their equipment was purchased on or after 7 September 2019 and connected to the System on or after 18 August 2019. ECP.A.3, ECP.A.5, ECP.A.6 OC5.4, OC5.5 OC.7.4, OC7.6 (OC7.6 - Scotland and Offshore only) OC9 OC10 OC12 BC1.4, BC1.5, BC.1.7, BC1.A.1, BC1.A.2.1 BC2 (in particular BC.2.9) BC3.3, BC3.4, BC3.5, BC.3.6, BC.3.7, 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. Note that a Generator in respect of a Type A Power Generating Module will have to meet those requirements of the Grid Code as applicable to Type A Power Generating Modules. However, where a Generator in respect of a Small Power Station comprises Type A Power Generating Modules, then the requirements on Small Power Stations are less onerous than those of Large Power Stations but this does not exclude those specific requirements applicable to Type A Power Generating

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
			Modules. The requirements will also vary if the Type A Power Generating Module is Embedded or Directly Connected.

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
		Any Generator who does not have a CUSC Contract (i.e. Embedded) and owns or operates a Power Station comprising one or more Type A Power Generating Modules.	Not applicable. Under the current GB Framework, there is currently no requirement for Non-CUSC Parties who own or operate a Type A Power Generating Module to contribute to the System Defence Plan. This however is subject to review and the ESO expect to work with all Stakeholders in the future to consider the approach to including Non-CUSC Parties within the System Defence Plan.
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	Existing	Any Generator who is a GB Code User who has a CUSC Contract with the ESO and owns or operates a Power Station comprising one or more Generating Units or Power Park Modules which has a maximum output of greater than 400W but less than 1MW and connected below 110kV (equivalent to a Type A Power Generating Module). Non-Embedded Customers and BM Participants in respect of Closed Distribution Systems and Aggregators.	Applicable Grid Code requirements: CC6.1.2, CC.6.1.3, CC.6.1.4, CC.6.2.2.2, CC.6.3, CC.6.5, CC.8, CC.A.3, CC.A.4, CC.A.6, CC.A.7 DRSC if they are also providing Demand Response Services and their equipment was purchased on or after 7 September 2019 and connected to the System on or after 18 August 2019. CP.A.3 OC5.4, OC5.5, OC5.A.1, OC.5.A.2, OC5.A.3. OC.7.4, OC7.6 (OC7.6 - Scotland and Offshore only) OC9 OC10 OC12 BC1.4, BC1.5, BC.1.7, BC1.A.1, BC1.A.2.1 BC2 (in particular BC.2.9) BC3.3, BC3.4, BC3.5, BC.3.6, BC.3.7, 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

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
parties providing demand response where they qualify as defence service providers pursuant to Article 4(4)			in the same way as a Generator who owns or operates a Type B Power Generating Module. Note that a Generator in respect of a Type A Power Generating Module will have to meet those requirements of the Grid Code as applicable to Type A Power Generating Modules. However, where a Generator in respect of a Small Power Station comprises Type A Power Generating Modules, then the requirements on Small Power Stations are less onerous than those of Large Power Stations but this does not exclude those specific requirements applicable to Type A Power Generating Modules. The requirements will also vary if the Type A Power Generating Module is Embedded or Directly Connected.
		Any Generator who does not have a CUSC Contract (ie Embedded) and owns or operates a Power Station comprising one or more Generating Units or Power Park Modules which have a maximum output of greater than 400W but less than 1MW and connected below 110kV (equivalent to a Type A Power Generating Module).	Not applicable. Under the current GB Framework, there is currently no requirement for Non-CUSC Parties who own or operate a Type A Power Generating Module to contribute to the System Defence Plan. This however is subject to review and the ESO expect to work with all Stakeholders in the future to consider the approach to including Non-CUSC Parties within the System Defence Plan.

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
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 including Virtual Lead Parties	ECC.ECC.6.5 BC1, BC2, (ECC/CC.6.5 applies only)
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 the system,	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 Storage User as defined under the GC0096 Grid Code proposals	Applicable Grid Code requirements when acting as a Generator in an exporting mode of operation: ECC6.1.2, ECC.6.1.4, ECC.6.2.2.2, ECC.6.3, ECC.6.5, ECC.8, ECC.A.3, ECC.A.4, ECC.A.6, ECC.A.7 ECP.A.3, ECP.A.5, ECP.A.6 OC5.4, OC5.5 OC.7.4, OC7.6 (OC7.6 - Scotland and Offshore only) OC9 OC10 OC12

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
provided that they are identified as such in the system defence plans restoration plans or service contract.			BC1.4, BC1.5, BC.1.7, BC1.A.1, BC1.A.2.1 BC2 (in particular BC.2.9) BC3.3, BC3.4, BC3.5, BC.3.6, BC.3.7, 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.
	Existing	Any CUSC Party who owns or operates Storage plant	Applicable Grid Code requirements when acting as a Generator in an exporting mode of operation: CC6.1.2, CC.6.1.3, CC.6.1.4, CC.6.2.2.2, CC.6.3, CC.6.5, CC.8, CC.A.3, CC.A.4, CC.A.6, CC.A.7 CP.A.3 OC5.4, OC5.5, OC5.A.1, OC.5.A.2, OC5.A.3. OC.7.4, OC7.6 (OC7.6 - Scotland and Offshore only) OC9 OC10 OC12 BC1.4, BC1.5, BC.1.7, BC1.A.1, BC1.A.2.1 BC2 (in particular BC.2.9) BC3.3, BC3.4, BC3.5, BC.3.6, BC.3.7, In general, the requirements on Storage are the same as those on Generators. However, as Storage is comparatively new, and the requirements on storage are only being introduced through GC0096, Existing Generators caught by the requirements of the Bilateral Connection Agreement would have to satisfy the requirements of the Grid Code as listed above.

Table A1- GB Parties within the Scope of EU NCER

CUSC Parties, Application of the Grid Code and the relationship with the Emergency and Restoration Code

The Connection and Use of System Code (CUSC) defines the arrangements for parties connecting to or using the Transmission System including but not limited to, issues such as connection, charging, Mandatory Ancillary Services and Balancing Services.

It is a Mandatory requirement for any party (such as a Generator, HVDC System Owner, Network Operator, Non-Embedded Customer, Aggregator) which: -

Is directly connected to the Transmission System

Owns or operates a Large Power Station (a Large Power Station is defined in the Grid Code)

Owns or operates an HVDC System and whose Connection Point is at 110kV or above

Owns or operates a DC Converter Station and the Installation has a rating of 50MW or more.

Applies for Transmission Entry Capacity

Is a Licensed Supplier

Wishes to participate in the Balancing Mechanism

Owns or operates a Large Power Station and that Large Power Station comprises one or more Electricity Storage Modules

To sign the CUSC and have an Agreement with National Grid ESO. A condition of signing the CUSC will necessitate the need for that Party to also meet the applicable requirements of the Grid Code. In satisfying the requirements of the Grid Code, and through the amendments being introduced through Grid Code modification GC0127 and GC0128, any one of these parties (in satisfying the requirements of the Grid Code) will satisfy the requirements of EU NCER.

For the avoidance of doubt, a non CUSC Party would include one of the following categories, unless that Party has opted to sign the CUSC:

A Generator which owns or operates a Licence Exempt Embedded Medium Power Station (LEEMPS)

A Generator which owns or operates an Embedded Small Power Station

A Demand Response Provider who may have a commercial contract with National Grid ESO to provide Commercial Ancillary Services but has not signed the CUSC.

A HVDC System Owner who owns and operates an HVDC System and that HVDC System in Embedded and has a Connection Point below 110kV and has not signed the CUSC.

An DC Converter Station Owner who owns and operates a DC Converter Station and that DC Converter Station is not connected to the Transmission System and has a rating of less than 50MW and has not signed the CUSC.

A Generator which owns or operates an Electricity Storage Module and that Electricity Storage Module is part of an Embedded Medium Power

Station or Embedded Small Power Station and that Generator has not signed the CUSC.

ESO Interpretation

The ESO considers for the implementation of the EU NCER, only CUSC Parties need to be within the scope of the EU NCER. We believe that this is an appropriate position based on the Legal Advice received (one option would be to include the legal letter as an additional appendix in the Restoration Plan).

Appendix B: High Priority Users & Terms of Re-energisation

Within GB, a High Priority Significant Grid User would be classified as:

- A Black Start Service Provider
- A Large Power Station connected directly to the National Electricity Transmission System: or
- An Embedded Large Power Station

For the purposes of this Appendix, Embedded and Large Power Station have the same definition as that defined in the Grid Code

Appendix C: Current Restoration Plans & Black Start Service Providers

Due to the sensitive information held within these plans, these have been lodged with the Authority.

Appendix D: Substations Essential for Restoration Plan Procedures

Due to the sensitive information held within these plans, these have been lodged with the Authority.

Appendix E: List of Transmission Licensees and Distribution Network Operators (including Independent Distribution Network Operators responsible for Implementing System Restoration Plan Measures

A list of Transmission Licensees, Distribution Network Operators and Independent Distribution Network Operators (IDNOs) are available from Ofgem's website which is available from the following link.

https://www.ofgem.gov.uk/system/files/docs/2019/08/electricity_registered_or_service_addresses_new.pdf

All parties on this list are responsible for ensuring they are able to enact their System Restoration Plan responsibilities.

Appendix F: Glossary

Balancing Mechanism	The mechanism for the making and acceptance of offers and bids pursuant to the arrangements contained in the Balancing and Settlement Code.
Balancing Mechanism Participant	A person who is responsible for and controls one or more BM Units or where a Bilateral Agreement specifies that a User is required to be treated as a BM Participant for the purposes of the Grid Code. For the avoidance of doubt, it does not imply that they must be active in the Balancing Mechanism.
Black Start Service Provider	A **User** with a legal or contractual obligation to provide a service contributing to one or several measures of the **System Restoration Plan**.
BEIS	Her Majesty's Government Department for Business, Energy and Industrial Strategy.
CUSC Contract	As defined in the Grid Code is "One or more of the following agreements as envisaged in Standard Condition C1 of The Company's Transmission Licence: (a) the CUSC Framework Agreement; (b) a Bilateral Agreement; (c) a Construction Agreement or a variation to an existing Bilateral Agreement and/or Construction Agreement;
Distribution Network Operator	A person with a User System directly connected to the National Electricity Transmission System to which Customers and/or Power Stations (not forming part of the User System) are connected, acting in its capacity as an operator of the User System, but shall not include a person acting in the capacity of an Externally Interconnected System Operator or a Generator in respect of OTSUA. For the avoidance of doubt an Independent Network Operator (IDNO) is considered to have the same meaning and obligations as a Distribution Network Operator.
EU Code User	A User who is any of the following: - (a) A Generator in respect of a Power Generating Module (excluding a DC Connected Power Park Module) or OTSDUA (in respect of an AC Offshore Transmission System) whose Main Plant and Apparatus is connected to the System on or after 27 April 2019 and who concluded Purchase Contracts for its Main Plant and Apparatus on or after 17 May 2018 (b) A Generator in respect of any Type C or Type D Power Generating Module which is the subject of a Substantial Modification which is effective on or after

	27 April 2019. (c) A Generator in respect of any DC Connected Power Park Module whose Main Plant and Apparatus is connected to the System on or after 8 September 2019 and who had concluded Purchase Contracts for its Main Plant and Apparatus on or after 28 September 2018. (d) A Generator in respect of any DC Connected Power Park Module which is the subject of a Substantial Modification which is effective on or after 8 September 2019. (e) An HVDC System Owner or OTSDUA (in respect of a DC Offshore Transmission System including a Transmission DC Converter) whose Main Plant and Apparatus is connected to the System on or after 8 September 2019 and who had concluded Purchase Contracts for its Main Plant and Apparatus on or after 28 September 2018. (f) An HVDC System Owner or OTSDUA (in respect of a DC Offshore Transmission System including a Transmission DC Converter) whose HVDC System or DC Offshore Transmission System including a Transmission DC Converter) is the subject of a Substantial Modification on or after 8 September 2019. (g) A User which the Authority has determined should be considered as an EU Code User. (h) A Network Operator whose entire distribution System was first connected to the National Electricity Transmission System on or after 18 August 2019 and who had placed Purchase Contracts for its Main Plant and Apparatus in respect of its entire distribution System on or after 7 September 2018. For the avoidance of doubt, a Network Operator will be an EU Code User if its entire distribution System is connected to the National Electricity Transmission

	System at EU Grid Supply Points only. (i) A Non Embedded Customer whose Main Plant and Apparatus at each EU Grid Supply Point was first connected to the National Electricity Transmission System on or after 18 August 2019 and who had placed Purchase Contracts for its Main Plant and Apparatus at each EU Grid Supply Point on or after 7 September 2018 or is the subject of a Substantial Modification on or after 18 August 2019. (j) A Storage User in respect of an Electricity Storage Module whose Main Plant and Apparatus is connected to the System on or after XXXX 2020 and who concluded Purchase Contracts for its Main Plant and Apparatus on or after XXXX 2019. *(Dates are a consequence of GC0096 modification)*
EU Generator	A Generator or OTSDUA who is also an EU Code User.
European Regulation (EU) 2016/631	Commission Regulation (EU) 2016/631 of 14 April 2016 establishing a Network Code on Requirements of Generators
European Regulation (EU) 2016/1388	Commission Regulation (EU) 2016/1388 of 17 August 2016 establishing a Network Code on Demand Connection
European Regulation (EU) 2016/1447	Commission Regulation (EU) 2016/1447 of 26 August 2016 establishing a network code on requirements for Grid Connection of High Voltage Direct Current Systems and Direct Current-connected Power Park Modules
European Regulation (EU) 2017/1485	Commission Regulation (EU) 2017/1485 establishing a guideline on electricity transmission system operation
European Regulation (EU) 2017/2195	Commission Regulation (EU) 2017/2195 of 17 December 2017 establishing a guideline on electricity balancing
Externally Interconnected System Operator or EISO	Is defined in the Grid Code as "A person who operates an External System which is connected to the National Electricity Transmission System or a User System by an External Interconnection".
Frequency Sensitive Mode	A Genset, or Type C Power Generating Module or Type D Power Generating Module or DC Connected Power Park Module or HVDC System operating mode which will result in Active Power output changing, in response to a change in System Frequency, in a direction which assists in the recovery to Target Frequency, by operating

	so as to provide Primary Response and/or Secondary Response and/or High Frequency Response.
GB Code User	A User in respect of:- (a) A Generator or OTSDUA whose Main Plant and Apparatus is connected to the System before 27 April 2019, or who had concluded Purchase Contracts for its Main Plant and Apparatus before 17 May 2018, or whose Plant and Apparatus is not the subject of a Substantial Modification which is effective on or after 27 April 2019; or (b) A DC Converter Station owner whose Main Plant and Apparatus is connected to the System before 8 September 2019, or who had concluded Purchase Contracts for its Main Plant and Apparatus before 28 September 2018, or whose Plant and Apparatus is not the subject of a Substantial Modification which is effective on or after 8 September 2019; or (c) A Non Embedded Customer whose Main Plant and Apparatus was connected to the National Electricity Transmission System at a GB Grid Supply Point before 18 August 2019 or who had placed Purchase Contracts for its Main Plant and Apparatus before 7 September 2018 or that Non Embedded Customer is not the subject of a Substantial Modification which is effective on or after 18 August 2019.2018~~.;~~or (d) A Network Operator whose entire distribution System was connected to the National Electricity Transmission System at one or more GB Grid Supply Points before 18 August 2019 or who had placed Purchase Contracts for its Main Plant and Apparatus in respect of its entire distribution System before 7 September 2018 or its entire distribution System is not the subject of a Substantial Modification which is effective on or after 18 August 2019. For the avoidance of doubt, a Network Operator would still be classed as a GB Code User where its entire distribution

	System was connected to the National Electricity Transmission System at one or more GB Grid Supply Points, even where that entire distribution System may have one or more EU Grid Supply Points but still comprises of GB Grid Supply Points.
GB Generator	As defined in the Grid Code is "A Generator, or OTSDUA, who is also a GB Code User"
GB Synchronous Area	As defined in the Grid Code is "The AC power System in Great Britain which connects Users, Relevant Transmission Licensees whose AC Plant and Apparatus is considered to operate in synchronism with each other at each Connection Point or User System Entry Point and at the same System Frequency".
HVDC System	An electrical power system which transfers energy in the form of high voltage direct current between two or more alternating current (AC) buses and comprises at least two HVDC Converter Stations with DC Transmission lines or cables between the HVDC Converter Stations.
Local Joint Restoration Plan	As defined in the Grid Code is "A plan produced under OC9.4.7.12 of the Grid Code detailing the agreed method and procedure by which a Genset at a Black Start Station (possibly with other Gensets at that Black Start Station) will energise part of the Total System and meet complementary blocks of local Demand so as to form a Power Island. In Scotland, the plan may also: cover more than one Black Start Station; include Gensets other than those at a Black Start Station and cover the creation of one or more Power Islands".
GB NETS	Great Britain National Electricity Transmission System
National Electricity Transmission System Security and Quality of Supply Standards or NETS SQSS	The National Electricity Transmission System Security and Quality of Supply Standard as published on The National Grid ESO Website: https://www.nationalgrideso.com/codes/security-and-quality-supply-standards?code-documents
NGESO	The National Electricity Transmission System Operator is responsible for operating the Onshore Transmission System and, where owned by Offshore Transmission Licensees, Offshore Transmission Systems. The NGNGESO for Great Britain is currently National Grid Electricity System Operator.

Non-Embedded Customer	A Customer in Great Britain, except for a Network Operator acting in its capacity as such, receiving electricity direct from the Onshore Transmission System irrespective of from whom it is supplied.
Partial Shutdown	A Partial Shutdown is the same as a Total Shutdown except that all generation has ceased in a separate part of the Total System and there is no electricity supply from External Interconnections or other parts of the Total System to that part of the Total System. Therefore, that part of the Total System is shutdown with the result that it is not possible for that part of the Total System to begin to function again without TSOs directions relating to a Black Start.
Power Generating Module	Either a Synchronous Power-Generating Module or a Power Park Module owned or operated by an EU Generator or a GB Generator.
Power Island	One or more Power Stations, together with complementary local demand.
Power System Synchroniser	Equipment which synchronises two electrically separate synchronous areas together to create one synchronous area.
Skeleton Network	The detailed restoration plan for restoring a skeletal GB NETS
System Operator Transmission Owner Code or STC	The System Operator Transmission Owner Code as published on The National Grid ESO Website: https://www.nationalgrideso.com/codes/system-operator-transmission-owner-code?code-documents
Target Frequency	That Frequency determined by The Company, in its reasonable opinion, as the desired operating Frequency of the Total System or Power Island. This will normally be 50.00Hz plus or minus 0.05Hz, except in exceptional circumstances as determined by The Company, in its reasonable opinion when this may be 49.90 or 50.10Hz. An example of exceptional circumstances may be difficulties caused in operating the System during disputes affecting fuel supplies.
Total System	The National Electricity Transmission System and all User Systems in the National Electricity Transmission System Operator Area.
Total Shutdown	A Total Shutdown is the situation existing when all generation has ceased and there is no electricity supply from External Interconnections. Therefore, the Total System has shutdown with

	the result that it is not possible for the Total System to begin to function again without TSO's directions relating to a Black Start.
TSO	A Transmission System Operator is a natural or legal person responsible for operating, ensuring the maintenance of and, if necessary, developing the transmission system in a given area and, where applicable, its interconnections with other systems, and for ensuring the long-term ability of the system to meet reasonable demands for the transmission of electricity.
Type C Power Generating Module	A Power-Generating Module with a Grid Entry Point or User System Entry Point below 110 kV and a Maximum Capacity of 10 MW or greater but less than 50 MW.
Type D Power Generating Module	A Power-Generating Module: with a Grid Entry Point or User System Entry Point at, or greater than, 110 kV; or with a Grid Entry Point or User System Entry Point below 110 kV and with Maximum Capacity of 50 MW or greater.
Unacceptable Frequency Conditions	These are conditions defined in the NETS SQSS where: i) the steady state frequency falls outside the statutory limits of 49.5Hz to 50.5Hz; or ii) ii) a transient frequency deviation on the MITS persists outside the above statutory limits and does not recover to within 49.5Hz to 50.5Hz within 60 seconds. Transient frequency deviations outside the limits of 49.5Hz and 50.5Hz shall only occur at intervals which ought to reasonably be considered as infrequent. In order to avoid the occurrence of Unacceptable Frequency Conditions: a) The minimum level of loss of power infeed risk which is covered over long periods operationally by frequency response to avoid frequency deviations below 49.5Hz or above 50.5Hz will be the actual loss of power infeed risk present at connections planned in accordance with the normal infeed loss risk criteria; b) The minimum level of loss of power infeed risk which is covered over long periods operationally by frequency

		response to avoid frequency deviations below 49.5Hz or above 50.5Hz for more than 60 seconds will be the actual loss of power infeed risk present at connections planned in accordance with the infrequent infeed loss risk criteria. It is not possible to be prescriptive with regard to the type of secured event which could lead to transient deviations since this will depend on the extant frequency response characteristics of the system which NGESO adjust from time to time to meet the security and quality requirements of this Standard.

Faraday House, Warwick Technology Park,
Gallows Hill, Warwick, CV346DA

nationalgridNGESO.com