

Glossary and Definitions (referenced in Section J)

Critical Tools and Facilities

Apparatus and tools required in relation to System Restoration:

In the case of The Company include, but are not limited to:

- i) Tools for operating and monitoring the Transmission System including but not limited to state estimation, the Balancing Mechanism, Load and System Frequency control, alarms, real time system operation and operational security analysis including off line transmission analysis;
- ii) The ability to control, protect and monitor transmission assets including switchgear, tap changers and other Transmission System equipment including where available auxiliary equipment and to ensure the safe operation of Plant and Apparatus and the safety of personnel;
- iii) Control Telephony systems as provided for in CC.6.5.1 – CC.6.5.5 and ECC.6.5.1 – ECC.6.5.5;
- iv) Operational telephony as provided for in STCP 04-5; and
- v) Tools and communications systems to facilitate cross border operations.

In the case of Generators, HVDC System Owners, DC Converter Station Owners, Defence Service Providers and Restoration Contractors and for Virtual Lead Parties on or after 31 December 2026:

- i) Tools for monitoring their Plant and Apparatus;
- ii) The ability to control, protect and monitor their Plant and Apparatus necessary for System Restoration including as applicable primary Plant, switchgear, tap changers and other auxiliary equipment and to ensure the safe operation of Plant and personnel; and
- iii) Control Telephony as provided for in CC.6.5.1 – CC.6.5.5 and ECC.6.5.1 – ECC.6.5.5.

In the case of Network Operators:

- i) Control room Apparatus and tools for monitoring their System including but not limited to, alarms, real time system operation and operational security analysis including off line network analysis;
- ii) The ability to control, protect and monitor those assets necessary for System Restoration including switchgear, tap changers, active network management schemes and other network equipment including where available auxiliary equipment and to ensure the safe operation of Plant and personnel; and
- iii) Control Telephony as provided for in CC.6.5.1 – CC.6.5.5 and ECC.6.5.1 – ECC.6.5.5.

In the case of Non-Embedded Customers:

- i) Tools for monitoring their System including but not limited to, alarms and real time system operation;
- ii) The ability to control, protect and monitor those assets necessary for System Restoration including switchgear, tap changers and other network equipment including where available auxiliary equipment and to ensure the safe operation of Plant and personnel; and
- iii) Control Telephony as provided for in CC.6.5.1 – CC.6.5.5 and ECC.6.5.1 – ECC.6.5.5.

<p>Distribution Restoration Zone Plan</p>	<p>A plan produced and agreed by a Network Operator, The Company, Restoration Contractors and in certain situations a Transmission Licensees under OC9.4.7.7, detailing the agreed method and procedure by which a Network Operator will instruct a Restoration Contractor with an Anchor Plant to energise, part of a Network Operator's System Total System within 8 hours of that instruction, and subsequently meet complementary blocks of local Demand so as to form a Power Island. A Distribution Restoration Zone Plan may require the use of Top Up Restoration Plant.</p> <p>A Distribution Restoration Zone Plan is distinct from and falls outside the provisions of a Local Joint Restoration Plan.</p>
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<p>Electricity System Restoration Standard</p>	<p>As defined in Special Condition 2.2 of The Company's Transmission Licence.</p>
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<p>Offshore Local Joint Restoration Plan</p>	<p>A plan produced and agreed by The Company, Offshore Transmission Licensees, Restoration Contractors, a Network Operator and in some cases an Onshore Transmission Licensee under OC9.4.7.7, detailing the agreed method and procedure by which The Company will instruct a Restoration Contractor with an Anchor Plant located Offshore to energise, part of the Total System (including but not limited to parts of the Offshore Transmission System) within 2 hours of that instruction and subsequently meet complementary blocks of local Demand so as to form a Power Island. An Offshore Local Joint Restoration Plan may require the use of Top Up Restoration Plant.</p> <p>An Offshore Local Joint Restoration Plan is distinct from and falls outside the provisions of a Distribution Zone Restoration Plan</p>
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<p>Restoration Contractor</p>	<p>An Anchor Restoration Contractor or a Top Up Restoration Contractor.</p>
<p>Restoration Plan</p>	<p>Either a Local Joint Restoration Plan, a Distribution Restoration Zone Plan or an Offshore Local Joint Restoration Plan as the context requires.</p>

<p>System Restoration</p>	<p>The procedure necessary for a recovery from a Total Shutdown or Partial Shutdown.</p>
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Operating Code 5 (referenced in Section C)

OC5.7 SYSTEM RESTORATION TESTING

OC5.7.1 General

As provided for in OC9.1.1 there are two ways in which the **Total System** (or disconnected part of the **Total System** in the case of a **Partial Shutdown**) can be re-established. These being a top-down approach using **Local Joint Restoration Plans** or a bottom-up approach using **Distribution Restoration Zone Plans** which are necessary in order to satisfy the requirements of the **Electricity System Restoration Standard**.

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

- (a) **The Company** and/or relevant **Network Operator** shall require a **Restoration Contractor** to carry out testing in order to demonstrate that its **Plant** and **Apparatus** has the appropriate capability.
 - (i) In the case of an **Anchor Generating Unit**, **The Company** and/or relevant **Network Operator** shall require the **Restoration Contractor** to carry out a test (either a **Anchor Generating Unit Test** or a **Anchor Power Station Test**) in order to demonstrate that an **Anchor Plant** has **Anchor Plant Capability**.
 - (ii) In the case of either an **Anchor HVDC System** or **Anchor DC Converter**, **The Company** or relevant **Network Operator** shall require the **Restoration Contractor** to carry out a test (an **Anchor HVDC System Test** or **Anchor DC Converter Test**), in order to demonstrate that an **Anchor HVDC System** or **Anchor DC Converter** has **Anchor Plant Capability**.
 - (iii) In the case of an **EU Generator** with an **Anchor Plant Capability** who is also a **Restoration Contractor**, **The Company** and/or relevant **Network Operator** may also require the **Restoration Contractor** to carry out a test (a **Quick Resynchronisation Unit Test**) in order to demonstrate that its **Anchor Power Station** has **Quick Re-Synchronisation Capability**.
 - (iv) In the case of a **Top Up Restoration Plant**, **The Company** and/or relevant **Network Operator** shall require the **Top Up Restoration Contractor** to demonstrate that the requirements of their **Top Up Restoration Contract** can be fulfilled.
- (b) Where **The Company** and/or relevant **Network Operator** requires a **Restoration Contractor** to undertake testing, the following requirements shall apply:-
 - (i) Each **Anchor Generating Unit** within an **Anchor Power Station** shall be required to undertake an **Anchor Generating Unit Test** at least once every three years. **The Company** and/or relevant **Network Operator** shall not require the **Anchor Generating Unit Test** to be carried out on more than one **Generating Unit** at that **Anchor Power Station** at the same time, and would not, in the absence of exceptional circumstances, expect any of the other **Generating Units** at the **Anchor Power Station** to be directly affected by the **Anchor Generating Unit Test**.
 - (ii) **The Company** and/or relevant **Network Operator** may occasionally require the **Anchor Generator** to carry out an **Anchor Power Station Test** at any time (but will not require a **Anchor Power Station Test** to be carried out more than once in every three calendar years in respect of any particular **Generating Unit** unless it can justify on reasonable grounds the necessity for further tests or unless the further test is a re-test). If successful, this **Anchor Power Station Test** shall count as a successful **Anchor Generating Unit Test** for the **Generating Unit** used in the test.

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- (iii) **The Company** and/or relevant **Network Operator** shall require the **Anchor HVDC System Owner** or **Anchor DC Converter Owner** to carry out an **Anchor HVDC System Test** at least once every three years which could be at any time (but such a test will not be required to be carried out more than once in every three calendar years unless it can justify on reasonable grounds the necessity for further tests or unless the further test is a re-test).
- (iv) **The Company** and/or relevant **Network Operator** may require the **EU Generator** to carry out a **Quick Re-Synchronisation Test** at any time, but this will generally only be required where the **EU Generator** has made a change to its **Plant** and **Apparatus** which has an impact on its **Houseload Operation** or after two unsuccessful tripping **Events** in the operational environment. The timing of the test shall be agreed by the relevant parties.
- (v) **The Company** and/or relevant **Network Operator** shall require the **Restoration Contractor** to carry out testing on its **Top Up Restoration Plant** at least once every three years which could be at any time (but such a test will not be required to be carried out more than once in every three calendar years unless it can justify on reasonable grounds the necessity for further tests or unless the further test is a retest).

The above tests will be deemed a success where starting from **Shutdown** is achieved within a time frame specified by **The Company** and/or relevant **Network Operator** and which will be agreed in the **Restoration Contract**.

- (c) When **The Company** and/or relevant **Network Operator** wishes a **Restoration Contractor** to carry out either an **Anchor Generating Unit Test**, an **Anchor Power Station Test**, an **Anchor System HVDC Test**, **Quick Re-Synchronisation Test** or **Top Up Restoration Test**, it shall notify the relevant **Restoration Contractor** at least 7 days prior to the time of the test with details of the proposed test.

OC5.7.2 Procedures for Restoration Service Tests

OC5.7.2.1 Anchor Generating Unit Tests

- (a) The relevant **Generating Unit** shall be **Synchronised** and **Loaded**.
- (b) All the **Auxiliary Energy Supplies** in the **Anchor Power Station** in which that **Generating Unit** is situated, shall be **Shutdown**.
- (c) The **Generating Unit** shall be **De-Loaded** and **De-Synchronised** and all alternating current electrical supplies to its **Auxiliaries** shall be disconnected.
- (d) The **Auxiliary Energy Supplies** to the relevant **Generating Unit** shall be started, and shall re-energise the **Unit Board** of the relevant **Generating Unit**.
- (e) The **Auxiliaries** of the relevant **Generating Unit** shall be fed by the **Auxiliary Energy Supplies**, via the **Unit Board**, to enable the relevant **Generating Unit** to return to **Synchronous Speed**.
- (f) The relevant **Generating Unit** shall be **Synchronised** to the **System** but not **Loaded**, unless a subsequent instruction is issued by **The Company** or relevant **Network Operator** under **BC2**.
- (g) Where required by **The Company** and/or relevant **Network Operator** and technically feasible, the test may be arranged such that the relevant **Generating Unit** shall energise the dead sections of the **System** as required in the relevant **Restoration Plan**. As part of these tests, **The Company** (in the case of an **Local Joint Restoration Plan**) or **Network Operator** (in the case of a **Distribution Restoration Zone Plan**) may require the **Anchor Generator** to undertake a:
 - a) A dead line charge test only; or
 - b) A dead line charge and a remote synchronisation test.

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A dead line charge test would require the steps detailed in (i) and (ii) below to be undertaken.
A remote synchronisation test would require the steps detailed in (i) – (iii) below to be undertaken.

- i) **Start-Up** of one or more of the **Generating Units** at the **Anchor Power Station** under normal operational conditions;
- ii) Re-energisation of a dead test section of the **Total System** as defined in the **Local Joint Restoration Plan** or **Distribution Restoration Zone Plan** as appropriate; and
- iii) Demonstration of the ability to synchronise to a section of the **Total System** at a location remote from the **Anchor Power Station's Grid Entry Point** or **User System Entry Point** (as the case may be).

A dead line charge test is to demonstrate the **Anchor Generating Unit's** ability to charge a pre-defined dead part of the **Total System** and its ability to control the voltage on that part of the **Total System**.

A remote synchronisation test is used to demonstrate the successful operation of a **Transmission Licensee's** or **Network Operator's** system synchronising facilities across individual circuit breakers which are either i) a necessary part of a **Local Joint Restoration Plan** or ii) defined in a **Distribution Restoration Zone Plan**.

When planning a dead line charge test, consideration shall be given to the effect the test will have on **Customers** supplied from the part of the **Total System** that needs to be de-energised, including whether their supplies would need to be interrupted to undertake the test. Where possible, tests should be conducted to avoid interruption to **Customer** supplies however where this is not possible, alternative tests or computer simulation exercises can be agreed between **The Company, Relevant Transmission Licensee** (as applicable), the **Network Operator** (as applicable) and the **Restoration Contractor**. Where it is identified that routine testing cannot be undertaken which is critical to restoration of the **Total System**, from a strategic perspective, as a result of interruption to **Customer** supplies, consideration should be given to **System** reconfiguration where such a change is technically and economically viable which would be agreed between **The Company, Relevant Transmission Licensee** and **Network Operator** (as appropriate).

- (h) In respect of **EU Generators**, the above tests defined in OC5.7.2.1(a) – (g) shall be assessed against the requirements of ECC.6.3.5.3.
- (i) **The Company** and/or **Network Operator** shall agree with **Anchor Restoration Contractor** when the above tests have been completed.

OC5.7.2.2 Anchor Power Station Test

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

OC5.7.2.3 Anchor HVDC Test or Anchor DC Converter Test

- a) The **HVDC System** or **DC Converter** shall demonstrate its technical capability to energise the busbar of the disconnected AC substation to which it is connected, within the **GB Synchronous Area** within a timeframe specified by **The Company** and/or relevant **Network Operator** in the **Anchor Restoration Contract** or **Top Up Restoration Contract**. In the case of **HVDC Systems** this shall be in accordance with the requirements of ECC.6.3.5.4. As part of this test, all **Auxiliaries** are required to be derived from within the **HVDC System** or **DC Converter Station**;
- b) The test shall be carried out while the **HVDC System** or **DC Converter Station** starts from **Shutdown**;
- c) The test shall be deemed to have been successfully completed when the following conditions are cumulatively fulfilled:
 - i) The **HVDC System Owner** has demonstrated its **HVDC System** or **DC Converter Station** is able to energise the busbar of the isolated AC-substation to which it is connected within the **GB Synchronous Area**.
 - ii) The **HVDC System** or **DC Converter Station** can achieve a stable operating point at an agreed capacity as agreed with **The Company** and/or relevant **Network Operator**. The relevant **HVDC System** or **DC Converter Station** can be connected to the **Total System** but not **Loaded**, unless appropriate instructions are given by **The Company** under **BC2** which would also be in accordance with the requirements of the **Anchor Restoration Contract**.
 - iii) In respect of **HVDC Systems** and **Remote End HVDC Converter Stations**, the above tests defined in OC5.7.2.3(a) – (c) shall be assessed against the requirements of ECC.6.1.2, ECC.6.1.4, ECC.6.2.2.9.4 and ECC.6.3.5.4.
 - iv) In respect of **DC Converter Stations**, the above tests defined in OC5.7.2.3(a) – (c) shall be assessed against the requirements of, CC.6.1.2, CC.6.1.3 and CC.6.1.4.
- (d) As part of these tests, **The Company** (in the case of an **Local Joint Restoration Plan**) or **Network Operator** (in the case of a **Distribution Restoration Zone Plan**) may require the **Anchor HVDC System Owner** or **Anchor DC Converter Owner** to undertake a:
 - a) A dead line charge test only; or
 - b) A dead line charge and a remote synchronisation test.

A dead line charge test would require the steps detailed in OC5.7.2.3(d) (i) and (ii) to be undertaken. A remote synchronisation test would require the steps detailed in OC5.7.2.3(d) (i) – (iii) to be undertaken.

- i) **Start-Up** of the **HVDC System** or **DC Converter Station** under normal operational conditions.
- ii) Re-energisation of a dead test section of the **Total System** as defined in the **Local Joint Restoration Plan** or **Distribution Restoraion Zone Plan** as appropriate.
- iii) Demonstration of the ability to synchronise to a section of the **Total System** at a location remote from the **HVDC System** or **DC Converter Station Grid Entry Point** or **User System Entry Point** (as the case may be).

A dead line charge test is to demonstrate the **HVDC System** or **DC Converter Stations** ability to charge a pre-defined dead part of the **Total System** and its ability to control the voltage on that part.

A remote synchronisation test is used to demonstrate the successful operation of a **Transmission Licensee's** or **Network Operator's** system synchronising facilities across individual circuit breakers which are either necessary part of a **Local Joint Restoration Plan** or defined in a **Distribution Restoration Zone Plan**.

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When planning a dead line charge test, consideration shall be given to the effect the test will have on **Customers** supplied from the part of the **Total System** that needs to be de-energised, including whether their supplies would need to be interrupted to undertake the test. Where possible, tests should be conducted to avoid interruption to **Customer** supplies however where this is not possible, alternative tests or computer simulation exercises can be agreed between **The Company, Relevant Transmission Licensee** (as applicable), **Network Operator** (as applicable) and **Restoration Contractor**. Where it is identified that routine testing cannot be undertaken which is critical to restoration of the **Total System**, from a strategic perspective, as a result of interruption to **Customer** supplies, consideration should be given to **System** reconfiguration where such a change is technically and economically viable which would be agreed between the **The Company, Relevant Transmission Licensee** and **Network Operator** (as appropriate).

OC5.7.2.4 Top Up Restoration Plant Tests

Top Up Restoration Contractors have contracts with **The Company** and where appropriate **Network Operators**, to provide a service in respect of their **Top Up Plant** to contribute to a **Local Joint Restoration Plan** or **Distribution Restoration Zone Plan**. As provided for in OC9.4.7.7.4 and OC9.4.7.8.4, **Top Up Restoration Contractors** will be generally be instructed to prepare their **Top Up Restoration Plant** immediately after instructions are issued to **Restoration Contractors** in respect of their **Anchor Plant** such that a **Top Up Restoration Contractor** can deliver the service they have agreed to provide, without delay, upon restoration of external site supplies. The purpose of these tests is to demonstrate that **Top Up Restoration Plant** has the capability in accordance with the requirements of the **Top Up Restoration Contract**.

- (a) Prior to the test, the relevant **Transmission Licensee** and/or **Network Operator** shall reconfigure its **System** as necessary to enable the test of the relevant **Plant** and **Apparatus** to be completed whilst having due regard for the safety of **Plant** and **Apparatus** and personnel on or adjacent to its **System**, and for the public.
- (b) The relevant **Plant** and/or **Apparatus** shall be operating normally, i.e. in the operational state it is anticipated to be in if a **Shutdown** were to occur.
- (c) All the **Auxiliary Energy Supplies** which relate to the relevant **Plant** and/or **Apparatus** shall be **Shutdown**.
- (d) The **Plant** and/or **Apparatus** shall be de-loaded, **De-Synchronised** and **Shutdown** as appropriate and all alternating current electrical supplies to its **Auxiliaries** shall be disconnected.
- (e) **Auxiliary Energy Supplies** at the **Top Up Plant** shall be started, and shall re-energise either directly, or via the **Station Board** or the **Unit Board** of the relevant **Plant**.
- (f) With the **Auxiliaries** available the relevant **Plant** and/or **Apparatus** should be in a position to return to a condition when it is ready to be reconnected and/or **Synchronised** to the **System**.
- (g) Relevant **Top Up Restoration Plant** shall be **Synchronised** to the **System** and shall be **Loaded** with **Active Power** and/or **Reactive Power** as agreed with **The Company** and/or the **Network Operator**, unless an overriding instruction has been given directly by **The Company** or from **The Company** to the **Network Operator** under **BC2**.
- (h) **The Company** and/or **Network Operator** shall agree with the **Top Up Restoration Contractor** when the test has been completed.

OC5.7.2.5 Quick Re-synchronisation Unit Test

- (a) The relevant **Generating Unit** shall be **Synchronised** and **Loaded**;
- (b) All the **Auxiliary Energy Supplies** in the **Anchor Power Station** in which that **Generating Unit** is situated, shall be **Shutdown**;
- (c) The **Generating Unit** shall tripped to house load;
- (d) The relevant **Generating Unit** shall be **Synchronised** to the **System** but not **Loaded**, unless the appropriate instruction has been given by **The Company** and/or **relevant Network**

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Operator under **BC2** which would also be in accordance with the requirements of the **Anchor Restoration Contract**;

In respect of **EU Generators**, the above tests defined in OC5.7.2.5(a) – (c) shall be assessed against the requirements of ECC.6.3.5.6.

OC5.7.2.6 Distribution Restoration Zone Control System Tests

Where a **Network Operator** uses a **Distribution Restoration Zone Control System** as part of the implementation of a **Distribution Restoration Zone Plan**, the **Network Operator** shall undertake tests or otherwise demonstrate the correct functioning of the **Distribution Restoration Zone Control System**. The tests shall be in accordance with the requirements of the **Distribution Restoration Zone Control System** standard as specified in the **Electrical Standard** listed in the annex to the **General Conditions**

OC5.7.2.7 General Testing Arrangements

All the above tests listed in OC5.7.2.1 to OC5.7.2.6, shall be carried out at the time agreed by **The Company** and/or relevant **Network Operator** in the notice given under OC5.7.1 and shall be undertaken in the presence of a reasonable number of representatives appointed and authorised by **The Company** and/or relevant **Network Operator**, who shall be given access to all information relevant to the **Test**. In the case of a **Restoration Contractor** who wishes to undertake their own tests independently of a test requested by **The Company** and/or **Relevant Network Operator**, then they shall be undertaken in accordance with OC7.5.

OC5.7.3. Failure of Restoration Service Tests

OC5.7.3.1 An **Anchor Restoration Contractor** shall fail an **Anchor Plant Test** if it fails to energise parts of the **System** and to provide the **Active Power** or **Reactive Power** output in accordance with that specified in the **Anchor Restoration Contract**.

OC5.7.3.2 A **Top Up Restoration Contractor** shall fail a **Top Up Restoration Plant Test** if it fails to be **Synchronised** to the **System** and to provide the **Active Power** or **Reactive Power** output in accordance with that specified in the **Top Up Restoration Contract**.

OC5.7.3.4 If a **Restoration Contractor's Plant** fails to pass a **Restoration Service Test** the **Restoration Contractor** must provide **The Company** and/or relevant **Network Operator** with a written report specifying in reasonable detail the reasons for any failure of the test so far as they are then known to the **Restoration Contractor** after due and careful enquiry. This must be provided within five **Business Days** of the test. If a dispute arises relating to the failure, **The Company** and/or relevant **Network Operator** and the relevant **Restoration Contractor** shall seek to resolve the dispute by discussion. To aid resolution of the dispute the **Restoration Contractor** may request **The Company** and/or relevant **Network Operator** to help facilitate a further **Restoration Service Test** with 48 hours notice which shall be carried out following the applicable procedure set out in OC5.7.2.1 to OC5.7.2.7 as the case may be.

OC5.7.3.5 If the **Restoration Contractor's Plant** and **Apparatus** concerned fails to pass the re-test and a dispute arises on that re-test, the parties may use the **Disputes Resolution Procedure** for a ruling in relation to the dispute, which shall be binding.

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OC5.7.3.6 If, following the procedure in OC5.7.3.4 and OC5.7.3.5, it is accepted that the **Restoration Contractor** has failed the **Restoration Service Test** (or a re-test carried out under OC5.7.2.7), within 14 days, or such longer period as **The Company** and/or relevant **Network Operator** may reasonably agree, following such failure, the relevant **Restoration Contractor** shall submit to **The Company** and/or relevant **Network Operator** in writing for approval, the date and time by which that **Restoration Contractor** shall have brought the relevant **Plant** and/or **Apparatus** back to a suitable state that it would pass a **Restoration Service Test**, and **The Company** and/or relevant **Network Operator** will not unreasonably withhold or delay its approval of the **Restoration Contractor's** proposed date and time submitted. Should **The Company** and/or relevant **Network Operator** not approve the **Restoration Contractor's** proposed date and time (or any revised proposal) the **Restoration Contractor** shall revise such proposal, having regard to any comments **The Company** and/or relevant **Network Operators** may have made, and resubmit it for approval.

OC5.7.3.7 Once the **Restoration Contractor** has indicated to **The Company** and/or relevant **Network Operator** that the **Restoration Contractor's Plant** and/or **Apparatus** has been restored to a suitable state, **The Company** and/or relevant **Network Operator** shall either accept this information or require the **Restoration Contractor** to demonstrate that the relevant **Plant** and/or **Apparatus** has its capability restored, by means of a repetition of the **Restoration Service Test** referred to in OC5.7.1 following the same procedure as for the initial **Restoration Service Test**. The provisions of this OC5.7.2 will apply to such test.

OC5.7.4 System Restoration Assurance, Awareness and Training

OC5.7.4.1 **The Company** will coordinate with **Users** and **Restoration Contractors** for undertaking regular exercises with **Users** and **Restoration Contractors** to ensure **System Restoration** plans are capable of meeting the **Electricity System Restoration Standard**.

OC5.7.4.2 **The Company** in coordination with **Users** and **Restoration Contractors** will undertake desk top and computer exercises and tests at the specified frequencies defined in Part IV of **DRC** Schedule 16 to confirm:-

- i) That **The Company's** plans for **System Restoration** are robust and sufficiently able to satisfy the requirements of the **Electricity System Restoration Standard**.
- ii) There is a high level of confidence that **Restoration Contractors** will be able to deliver the service they have contracted to provide.
- iii) There is a high level of confidence that **User's Critical Tools and Facilities** will be able to satisfy the requirements of CC7.10 and/or ECC.7.10 in addition to the requirements of CC7.11 and/or ECC.7.11.
- iv) There is a high level of assurance that **Local Joint Restoration Plans** and **Distribution Restoration Zone Plans** will be capable of contributing to the restoration of those sections of the **System** they have been designed to re-establish.
- v) That **Restoration Contractors** and **Users** have arrangements in place in order for them to receive and act upon instructions issued by **The Company** or relevant **Transmission Licensee** in Scotland or relevant **Network Operator** for a period of upto 72 hours following the loss of site supplies.
- vi) All communications systems used satisfy the minimum requirements of CC6.5.1 – CC.6.5.5 and/or ECC.6.5.1 – ECC.6.5.5.
- vii) **Network Operators** can satisfy the requirements of CC.6.4.5 and/or ECC.6.4.6.
- viii) **The Company** in coordination with **Network Operators** involved in planning the wider **System Restoration** process shall work collaboratively to ensure the balance of generation and demand, and minimise the risk of actions which could have a destabilising effect on the **Total System**.
- ix) Demonstrate their control systems will remain functional and can handle incidents when the **Total System** is in a de-energised state including client applications and server architecture.

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- x) Demonstrate the cyber-security of their voice and control systems in accordance with CC.7.10.6 or ECC.7.10.6.
- xi) Report the service level agreement compliance of their telephony systems including infrastructure and service provision as provided for CC.6.5.4 or ECC.6.5.4.
- xii) The resilience of voice systems including power supplies by its ability to withstand a minimum of 72 hours during **System Restoration**.

As part of these exercises, **Restoration Contractors** and **Users** are required to inform **The Company** of any assumptions they make and any reasons why they would be unable to fulfil their obligations.

OC.5.7.4.3 In addition to the above requirements, from 31 December 2026 onwards, **Users** and **Restoration Contractors** are also required to provide an annual statement confirming that their **Plant** and **Apparatus** has the capability to satisfy the requirements of OC.5.7 through their Week 24 data submission.

OC5.7.5 In addition to the requirements of OC5.7.4.2 the following assurance tests shall be undertaken at least once every three years.

- i) **Users, BM Participants** and **Restoration Contractors** shall undertake tests or otherwise demonstrate their **Critical Tools and Facilities** satisfy the requirements of CC.6.5.4.4, CC.6.5.5.1, CC.7.10 and CC.7.11 or ECC.6.5.4.4, ECC.6.5.5.1, ECC.7.10 and ECC.7.11 as applicable.
- ii) **User's, BM Participants** and **Restoration Contractors** shall undertake tests or otherwise demonstrate that their **Critical Tools and Facilities** are sufficiently robust and reliable enough to manage the high volumes of data and alarms that are expected to be generated during **System Restoration** in accordance with the requirements of CC.7.10.7 and/or ECC.7.10.7.

OC5.7.6 **The Company**, as part of its regular **System Restoration** assurance activities, will ensure **Users** and **Restoration Contractors** are capable of satisfying the applicable requirements of OC5.7.

Operating Code 9 (referenced in Section C)

OC9.4.7.6.2 Restoration Plan Testing

The Company, Relevant Transmission Licensees, the **Network Operator** and the relevant **Restoration Contractors** shall conduct regular joint exercises of the **Restoration Plan** to which they are parties. The objectives of such exercises include:

- To test the effectiveness of the **Restoration Plan**;
- To provide for joint training of the parties in respect of the **Restoration Plan**;
- To maintain the parties' awareness and familiarity of the **Restoration Plan**;

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- To promote understanding of each party's role under the **Restoration Plan**; and
- To identify any improvement areas which should be incorporated into the **Restoration Plan**.

The Company shall propose to the parties to a **Restoration Plan** a date for the exercise to take place. All the **Restoration Plan** parties will jointly share the task of planning, preparing, participating in, and facilitating the exercises, which will normally be in desktop format or as otherwise agreed. The precise timing of the exercise for each **Restoration Plan** will be agreed by all parties, but will not be less than once every 3 years. These exercises shall be run as part of the wider assurance activities as provided for under OC5.7.4

Connections Conditions (referenced in Section D and Section K)

CC.7.10 Obligations on Users in respect of Critical Tools and Facilities

CC.7.10.1 In addition to the requirements of CC.6.5.1 – CC.6.5.5 and CC.6.5.8(b), **The Company**, each **GB Code User** and **Restoration Contractor** shall ensure they have the appropriate **Critical Tools and Facilities**, necessary to control their assets during **System Restoration**, from their **Control Point** or **Control Centre** as appropriate for a minimum period of 72 hours (or such longer period as agreed between the **User** and/or **Restoration Contractor** and **The Company**) following a **Total Shutdown** or **Partial Shutdown**.

CC.7.10.2 In satisfying this requirement, **The Company** and **GB Code Users** in respect of their **Critical Tools and Facilities** shall ensure as far as reasonably practical that they have adequate control equipment redundancy in place so that in the event of a failure of one or more components of the control system its function is unimpaired.

CC.7.10.3 Each **GB Code User** and **Restoration Contractor** will report on the results of their management and testing for their **Critical Tools and Facilities** on request by **The Company**.

CC.7.10.4 Where a **Network Operator** installs a **Distribution Restoration Zone Control System** to facilitate operation of a **Distribution Restoration Zone Plan**, the high level functional requirements of the **Distribution Restoration Zone Control System** shall be specified in accordance with the requirements of the applicable electrical standard listed in the annex to the **General Conditions**.

CC.7.10.5 **Network Operators** shall ensure that their substations which are required to be operable during **System Restoration** have 72 hour electrical supply resilience to facilitate **Network Operators** being able to:

- restore auxiliary supplies to **Transmission** substations;
- switch **Demand** in accordance with a **Restoration Plan**;
- support **The Company** in satisfying the requirements of the **Electricity System Restoration Standard**.

CC.7.10.6 **The Company**, each **GB Code User** and **Restoration Contractor** shall ensure their **Critical Tools and Facilities** are cyber secure accordance with the Security of Network and Information System (NIS) Regulations. This requirement applies to **The Company**, **GB Code Users** and **Restoration Contractors** at all times.

CC.7.10.7 Notwithstanding the requirements of CC.7.10.1, **The Company**, each **GB Code User** and **Restoration Contractor** shall ensure that their control systems, communications systems, operational metering and telemetry systems including SCADA, are sufficiently robust and reliable such that they are capable of handling, processing and prioritising the significant volumes of data that could reasonably be expected to occur during **System Restoration**.

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- CC.7.10.8 Where an **Offshore Generator** is connected to an **Offshore Transmission System** and the **Offshore Transmission Licensee** does not have **Critical Tools and Facilities** installed on its **Offshore Transmission System**, **The Company** will make an allowance for the **Critical Tools and Facilities** required to be installed by the **Offshore Generator**.
- CC.7.11 Obligations on and Assurance from The Company, GB Code Users and Restoration Contractors during Total Shutdown and Partial Shutdown conditions
- CC.7.11.1 In respect of **The Company**, its **Apparatus** shall be designed such that it can safely shutdown and does not pose a risk to personnel or **Apparatus** in the event of a total loss of supply.
- CC.7.11.2 All **GB Code Users** and **Restoration Contractors** shall ensure their **Plant** and **Apparatus** can safely shut down and does not pose a risk to **Plant** and/or personnel in the event of a total loss of supplies at a **GB Code User's Site(s)** or **Restoration Contractor's** site be it caused by a **Total Shutdown, Partial Shutdown** or such other event. In satisfying this requirement, **Generators, DC Converter** owners and **Restoration Contractors** shall be able to demonstrate to **The Company** that in the event supplies were to be lost to their **Site**, then on the restoration of supplies, their **Plant** can be made operational and begin to operate in at least the same way and as quickly as would be expected for a cold start following a **Total System Shutdown** or **Partial System Shutdown** in accordance with the data submitted in PC.A.5.7 in accordance with the Week 24 process. **For GB Code Users where they believe this requirement is cost prohibitive or technically impossible, such GB Code Users shall discuss the issue with The Company, and The Company shall inform The Authority of the details agreed. Where such an issue cannot be agreed by The Company, following all reasonable attempts, or where the capability provided by the GB Code User cannot be agreed by The Company as being sufficient after examining all reasonable alternative solutions through the Compliance Processes, the GB Code User may apply for a derogation from the Grid Code.**
- CC.7.11.3 The requirements of CC.7.11.1 and CC.7.11.2 shall apply for a period of total loss of supplies to **The Company's** operational sites or a **GB Code User's Site** or **Restoration Contractor's** site of up to 72 hours. **GB Code Users** and **Restoration Contractors** shall confirm to **The Company** that the total loss of supplies to their **Site** for a period of up to 72 hours shall not result in damage to **Plant** and **Apparatus** such that it would then be unable to run upon the restoration of electrical supplies to the site.
- CC.7.11.4 **Network Operators** shall ensure that in coordination with **The Company** and relevant **Transmission Licensees**, they have the capability to switch **Demand** at sufficient speed to support **The Company** in satisfying the requirements of the **Electricity System Restoration Standard**. This requirement assumes:
- the successful implementation of **Restoration Plans**,
 - the successful delivery of the obligations of **Restoration Contractors** who are parties to these plans; and
 - the further requirements of OC9.

European Connections Conditions (referenced in Section D and Section K)

ECC.7.10 Obligations on Users in respect of Critical Tools and Facilities

ECC.7.10.1 In addition to the requirements of ECC.6.5.1 – ECC.6.5.5 and ECC.6.5.8(b), **The Company**, each **EU Code User** and **Restoration Contractor** shall ensure they have the appropriate **Critical Tools and Facilities**, necessary to control their assets during **System Restoration** from their **Control Point** or **Control Centre** as appropriate, for a minimum period of 72 hours (or such longer period as agreed between the **User** and/or **Restoration Contractor** and **The Company**) following a **Total Shutdown** or **Partial Shutdown**.

ECC.7.10.2 In satisfying this requirement, **The Company** and **EU Code User's** in respect of their **Critical Tools and Facilities** shall ensure as far as reasonably practical that they have adequate control equipment redundancy in place so that in the event of a failure of one or more components of the control system its function is unimpaired.

ECC.7.10.3 Each **EU Code User** and **Restoration Contractor** will report on the results of their management and testing for their **Critical Tools and Facilities** on request from **The Company**.

ECC.7.10.4 Where a **Network Operator** installs a **Distribution Restoration Zone Control System** to facilitate operation of a **Distribution Restoration Zone Plan**, the high level functional requirements of the **Distribution Restoration Zone Control System** shall be specified in accordance with the requirements in the applicable electrical standard listed in the annex to the **General Conditions**.

ECC.7.10.5 **Network Operators** shall ensure that their substations which are required to be operable during **System Restoration** have 72 hour electrical supply resilience to facilitate **Network Operators** being able to:

- restore auxiliary supplies to **Transmission** substations;
- switch **Demand** in accordance with a **Restoration Plan**;
- support **The Company** in satisfying the requirements of the **Electricity System Restoration Standard**.

ECC.7.10.6 **The Company**, each **EU Code User** and **Restoration Contractor** shall ensure their **Critical Tools and Facilities** are cyber secure accordance with the Security of Network and Information System (NIS) Regulations. This requirement applies to **The Company**, **EU Code Users** and **Restoration Contractors** at all times.

ECC.7.10.7 Notwithstanding the requirements of ECC.7.10.1, **The Company**, each **EU Code User** and **Restoration Contractor** shall ensure that their control systems, communications systems, operational metering and telemetry systems including SCADA, are sufficiently robust and reliable such that they are capable of handling, processing and prioritising the significant volumes of data that could reasonably be expected to occur during **System Restoration**.

ECC.7.10.8 Where an **Offshore Generator** is connected to an **Offshore Transmission System** and the **Offshore Transmission Licensee** does not have **Critical Tools and Facilities** installed on its **Offshore Transmission System**, **The Company** will make an allowance for the **Critical Tools and Facilities** required to be installed by the **Offshore Generator**.

ECC.7.11 Obligations on and Assurance from The Company, EU Code Users and Restoration Contractors during Total Shutdown and Partial Shutdown conditions

ECC.7.11.1 In respect of **The Company**, its **Apparatus** shall be designed such that it can safely shutdown and does not pose a risk to personnel or **Apparatus** in the event of a total loss of supply.

ECC.7.11.2 All **EU Code Users** and **Restoration Contractors** shall ensure their **Plant** and **Apparatus** can safely shut down and does not pose a risk to **Plant** and/or personnel in the event of a total loss of supplies

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at a **EU Code User's Site(s)** or **Restoration Contractor's** site be it caused by a **Total Shutdown, Partial Shutdown** or such other event. In satisfying this requirement, **Generators, HVDC System Owners** and **Restoration Contractors** shall be able to demonstrate to **The Company** that in the event supplies were to be lost to their **Site**, then on the restoration of supplies, their **Plant** can be made operational and begin to operate in at least the same way and as quickly as would be expected for a cold start following a **Total System Shutdown** or **Partial System Shutdown** in accordance with the data submitted in PC.A.5.7 in accordance with the Week 24 process. **For EU Code Users where they believe this requirement is cost prohibitive or technically impossible, such EU Code Users shall discuss the issue with The Company, and The Company shall inform The Authority** of the details agreed. **Where such an issue cannot be agreed by The Company following all reasonable attempts or where the capability provided by the EU Code User cannot be agreed by The Company as being sufficient after examining all reasonable alternative solutions through the Compliance Processes, the EU Code User may apply for a derogation from the Grid Code.**

ECC.7.11.3 The requirements of ECC.7.11.1 and ECC.7.11.2 shall apply for a period of total loss of supplies to **The Company's** operational sites or an **EU Code User's Site** or **Restoration Contractor's** site of up to 72 hours. **EU Code Users** and **Restoration Contractors** shall confirm to **The Company** that the total loss of supplies to their **Site** for a period of up to 72 hours shall not result in damage to **Plant** and **Apparatus** such that it would then be unable to run upon restoration of electrical supplies to the site.

ECC.7.11.4 **Network Operators** shall ensure that in coordination with **The Company** and relevant **Transmission Licensees**, they have the capability to switch **Demand** at sufficient speed to support **The Company** in satisfying the requirements of the **Electricity System Restoration Standard**. This requirement assumes:

- the successful implementation of **Restoration Plans**;
- the successful delivery of the obligations of **Restoration Contractors** who are parties to these plans; and
- the further requirements of OC9.