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| Workgroup Consultation | | | |
| **GC0156:**  Facilitating the Implementation of the Electricity System Restoration Standard  **Overview:** In October 2021, BEIS issued a direction in accordance with Special Condition 2.2 of National Grid’s Electricity System Operator’s Transmission Licence implementing an Electricity System Restoration Standard (ESRS) which requires 60% of transmission electricity demand to be restored within 24 hours in all regions and 100% of electricity demand to be restored within 5 days nationally. The ESO is proposing a number of changes to the Grid Code to facilitate this. | | **Modification process & timetable**    **Proposal Form**  09 February 2022  **Workgroup Consultation**  21 November 2022 – 09 December 2022  **Workgroup Report**  22 March 2023  **Code Administrator Consultation**  03 April 2023 – 03 May 2023  **Draft Modification Report**  17 May 2023  **Final Modification Report**  05 June 2023  **Implementation**  TBC  **1**  **2**  **3**  **4**  **5**  **6**  **7** | |
| **Have 5 minutes?** Read our [Executive summary](#_Executive_summary_1)  **Have 20 minutes?** Read the full [Workgroup Consultation](#_Why_change?)  **Have 30 minutes?** Read the full Workgroup Consultation and Annexes. | | | |
| **Status summary:** The Workgroup are seeking your views on the work completed to date to form the final solution(s) to the issue raised. | | | |
| **This modification is expected to have a:** High impact  On Restoration Service Providers, Generators, Non CUSC Parties, Transmission Licensees, Interconnectors, Transmission Owners, Distributed Network Owners, Non-Embedded Customers and the Electricity System Operator | | | |
| **Modification drivers:**  GB Compliance with the Special Condition 2.2 of National Grid’s Electricity System Operator’s Transmission Licence | | | |
| **Governance route** | Standard Governance | | |
| **Who can I talk to about the change?** | **Proposers:**  Sade Adenola / Tony Johnson  [Sade.adenola@nationalgrideso.com](mailto:Sade.adenola@nationalgrideso.com) /[antony.johnson@nationalgrideso.com](mailto:antony.johnson@nationalgrideso.com)  07748180789 | | **Code Administrator** **Chair**:  Banke John-Okwesa  [Banke.john-okwesa@nationalgrideso.com](mailto:Banke.john-okwesa@nationalgrideso.com)  07929716301 |
| **How do I respond?** | Send your response proforma to [grid.code@nationalgrideso.com](mailto:grid.code@nationalgrideso.com) **by 5pm on 09 December 2022** | | |

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# Executive summary

What is the issue?

On 24 August 2021, Ofgem published a [decision letter](https://www.ofgem.gov.uk/publications/decision-licence-modifications-facilitate-introduction-electricity-system-restoration-standard) stating that they made the decision to make the licence modifications. The modification decisions are publicly available and were implemented from 19 October 2021.

These licence modifications include but are not limited to:

* introducing the definition of “restoration services” in Standard Condition C1 and amending the definition of balancing services to include “restoration services”
* replacing all references to “black start” with “Electricity System Restoration” in the Electricity Transmission Licence, including in the ESO’s Special Licence Conditions, to align the licence terminology with BEIS’s policy
* introduction of updated Special Condition 2.2 of National Grid’s Electricity System Operator’s Transmission Licence requiring the introduction of an Electricity System Restoration Standard (ESRS) which requires 60% of electricity demand to be restored within 24 hours in all regions and 100% of electricity demand to be restored within 5 days nationally.

This modification is therefore necessary following a direction issued by BEIS. The date by which BEIS require the ESO to be compliant with the ESRS is 31 December 2026.

What is the solution and when will it come into effect?

**Proposer’s solution:** To establish a combined Grid Code and Distribution Code Working Group to determine how implementation of the ESRS can be facilitated by code modifications.

The ESO’s aim for implementation of the ESRS is to put in place measures, tools and procedures such that in the event of a total or partial shutdown, 60% of transmission demand can be restored within all regions in 24 hours and 100% of transmission demand can be restored in 5 days nationally. This is against the background that the Electricity System is in an intact and operable state and that there is not significant damage to electrical Plant and Apparatus.

**Implementation date:** January 2023

**Summary of potential alternative solution(s) and implementation date(s):** No alternative raised till date

What is the impact if this change is made?

Clarification of restoration requirements and obligation of parties will impact CUSC parties, Restoration Service Providers (RSPs) and Distribution Network Operators (DNOs) taking part in restoration activities.

Interactions

There are consequential changes for the CUSC, STC, BSC and the Distribution Code/G99.

What is the issue?

In April 2021, the Department for Business, Energy and Industrial Strategy (BEIS) released a [policy statement](https://www.gov.uk/government/publications/introducing-a-new-electricity-system-restoration-standard) setting out the need to introduce a legally binding target for the restoration of electricity supplies in the event of a National Electricity Transmission System (NETS) failure. This new policy is called the Electricity System Restoration Standard (ESRS). As a consequence of BEIS’s policy statement, Ofgem performed an [initial consultation](https://www.ofgem.gov.uk/publications/consultation-licence-amendments-facilitate-introduction-electricity-system-restoration-standard) in April 2021 followed by a [statutory consultation](https://www.ofgem.gov.uk/publications/statutory-consultation-licence-amendments-facilitate-introduction-electricity-system-restoration-standard-0) in July 2021 on licence amendments to facilitate the introduction of an ESRS, and to align the regulatory framework for procurement of restoration services with that of other balancing services.

On 24th August 2021, Ofgem published a [decision letter](https://www.ofgem.gov.uk/publications/decision-licence-modifications-facilitate-introduction-electricity-system-restoration-standard) stating that they made the decision to make the licence modifications. The modification decisions are publicly available and were implemented from 19th October 2021.

These licence modifications include but are not limited to:

* introducing the definition of “restoration services” in Standard Condition C1 and amending the definition of balancing services to include “restoration services”
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* introduction of updated Special Condition 2.2 of National Grid’s Electricity System Operator’s Transmission Licence requiring the introduction of an Electricity System Restoration Standard (ESRS) which requires 60% of electricity transmission demand to be restored within 24 hours in all regions and 100% of electricity transmission demand to be restored within 5 days nationally.

This modification is therefore necessary following a direction issued by BEIS. The date by which BEIS require the ESO to be compliant with the ESRS is 31 December 2026.

## Why change?

This modification is required to clarify the requirements on CUSC parties, Restoration Service Providers and Distribution Network Operators taking part in restoration activities of their obligations so that National Grid ESO can satisfy the new ESO Licence obligation.

What is the solution?

## Proposer’s solution

To establish a combined Grid Code and Distribution Code Working Group to determine how implementation of the ESRS can be facilitated by code modifications.

The ESO’s aim for implementation of the ESRS is to put in place measures, tools and procedures such that in the event of a total or partial shutdown, 60% of transmission demand can be restored within all regions in 24 hours and 100% of transmission demand can be restored in 5 days nationally. This is against the background that the Electricity System is in an intact and operable state and that there is not significant damage to electrical Plant and Apparatus.

This modification will build on the work completed through the implementation of the EU Emergency and Restoration Code (EU 2017/2196) which was in part introduced to the Grid Code through Grid Code modifications [GC0125](https://www.nationalgrideso.com/uk/electricity-transmission/industry-information/codes/grid-code-old/modifications/gc0125-eu-code-emergency-restoration-black), [GC0127](https://www.nationalgrideso.com/uk/electricity-transmission/industry-information/codes/grid-code-old/modifications/gc0127-eu-code-emergency-restoration) and [GC0128](https://www.nationalgrideso.com/uk/electricity-transmission/industry-information/codes/grid-code-old/modifications/gc0128-eu-code-emergency-restoration) and further being implemented through Grid Code modification [GC0148](https://www.nationalgrideso.com/uk/electricity-transmission/industry-information/codes/grid-code-old/modifications/gc0148-implementation-eu-emergency-and-0) (Implementation of EU Emergency and Restoration Code Phase II). In addition, the work will build on the Distributed Restart Project for which code changes are currently included in the GC0148 modification. In particular, many of the requirements being introduced through Grid Code modification GC0148 (including Distributed Restart) provide essential tools in achieving the objectives of the ESRS.

The Proposer’s solution is to replace all references to ‘Black Start’ with ‘Electricity System Restoration’ in line with the Licence changes described above. This would also be consistent with the proposals being put forward to change the CUSC and BSC.

The solution will also need to include changes to the System Restoration Plan and potentially the Test Plan.

As part of this modification, the proposer will also take the opportunity to undertake a house keeping change to OC5.7.1(b)(i) which is a correction that needs to be addressed following an inadvertent error arising from the implementation of Grid Code modification [GC0108](https://www.nationalgrideso.com/uk/electricity-transmission/industry-information/codes/grid-code/modifications/gc0108-eu-code-emergency-restoration-black-start) (EU Code: Emergency & Restoration: Black start testing requirements).

Workgroup considerations

The Workgroup convened 8 times to discuss the perceived issue, detail the scope of the proposed defect, devise potential solutions and assess the proposal in terms of the Applicable Code Objectives. The Workgroup was well-represented; potentially affected stakeholders were included and, opinions of relevant industry experts who were not Workgroup members were sought as and when required. In some circumstances, required experts were invited to join the workgroup/subgroup meetings to provide their views.

ESO Presentation on Modification Requirements

The ESO Rep delivered a presentation which highlighted the following key points:

* The aim of this modification - 60% of transmission demand restored within 24 hours (across all regions) and 100% restored within 5 days can only be achieved on the basis that network assets and Customers Plant and Apparatus (e.g. generation, storage, HVDC etc) are in an operational and functional state and there aren’t any extensive and prolonged Network or Plant damage.
* In Nov 2021, the ESO had set up 7 working groups to engage with the wider industry for initial recommendations on how to implement the new ESRS Licence Obligations. All the working groups were disbanded end of April 2022 and working group reports were shared with the GC0156 Workgroup for further development.
* The Distributed Restart Project recognises that the traditional suppliers of Black Start Services (Transmission Connected Thermal Plant) are becoming increasingly scarce. The outcome of the Distributed Re-Start project (which is currently included within the provisions of Grid Code Modification GC0148) is an important element of the ESRS.
* Following industry responses to the GC0148 Workgroup Consultation, the GC0148 Workgroup decided that the element of Distributed Re-Start within the GC0148 modification should be transferred into GC0156. This solution has not been considered within the GC0156 legal text available in Annex 5.

ESRS Recommendations

The NGESO ESRS Implementation Team provided a high-level overview of the initial ESRS workgroup recommendations that had been complied based on majority decision, including the suggestion to create 4 sub-groups within GC0156 to continue exploring the options and addressing the issues in the following areas: Future Networks, Assurance Activities, Communications Infrastructure and Markets and Funding Mechanism. The agreed Terms of Reference for each of these subgroups are available in Annex 4. The Proposer advised that the Steering Group, which has BEIS representation, will meet every 3 months to gain an update on GC0156 and provide expertise and resource where required.

Full details of the ESRS recommendations and reports from previous ESRS working groups are available in Annex 3.

Implementation Costs

Workgroup members expressed the need to see the draft legal texts before deciding whether there is a need for cost benefit analysis and what factors need to be considered within this. It was noted that some cost elements had been considered and addressed within the Markets and Funding subgroup discussions. Full discussions and recommendations are available in Annex 4.

Discussions on Black Start

The NGESO Rep explained that the traditional approach to Black Start the System is to place contracts with strategically located Black Start Stations across the country and, in the event of a Black Start situation these Power Stations are instructed by the ESO to start within 2 hours and energise parts of the Transmission System. Subsequently, a process called Local Joint Restoration Plan (LJRP) takes place where sections of Distribution Networks are connected to with blocks of Demand connected which runs in parallel and in each case the LJRP is used to form a Power Island. The Power Islands are connected to form a skeleton Network ahead of greater connection of Power Stations and restoration of demand detailed in OC9 of the Grid Code with testing for Black Start Service Providers being covered in OC5. It was also highlighted that going forward, the number of traditional Black Start Providers are reducing, and additional solutions need to be identified to restore the system in accordance with the ESRS thus it is in everyone’s best interest to restore the system as quickly as possible in the most economic manner.

Clarification of Definition of Restoration Demand/Region

The Workgroup challenged the operability of the definition of Demand and raised the following concerns:

* Too vague; did not specify the expectations of areas where the Transmission demand would be 0% at the time of GB peak
* No consideration of weekend versus weekday impacts
* No consider as to whether the target should be whole system demand or transmission demand

An official from BEIS was invited to one of the Workgroup meetings to clarify the definition. They confirmed that BEIS’ direction specifies that “electricity demand” should be calculated as “transmission demand”. The requirement to restore 60% of transmission demand within 24 hours is an obligation placed on the NGESO and the requirement to ensure that the necessary services and tools required to meet the standard are in place by December 2026. It was confirmed that 60 percent was the minimum standard required within 24 hours, with the expectation that industry parties would be doing everything possible to return the system to normal as quickly as possible.

Following this, several Workgroup Members expressed further concerns that the standard was based around ‘transmission demand’ versus ‘distribution demand’ and it would not be sufficient to stabilise the grid. The BEIS Representative confirmed that the standard had been agreed based on assurance from NGESO that the proposed level would be sufficient to maintain a stable electricity grid therefore, the NGESO are obligated to provide enough demand to stabilise the electricity grid. They advised that whilst there were no current plans to change the standard, it was likely to be revisited as part of the long-term future system resilience work.

The NGESO Rep clarified that the proposed 60% of transmission demand had been arrived at by simulations and it was the minimum standard the NGESO could arrive at the time the studies. The BEIS Rep suggested that NGESO and industry need to work together to operationalise the direction and ensure any nuances are understood.

**Subgroups Considerations and Outcomes**

The 4 subgroups met bi-weekly between July 2022 – October 2022 to consider and develop different aspects of the modification requirements as outlined below. Some Workgroup members queried the relevance of the Markets and Funding Mechanism Subgroup to GC0156, after deliberations on this it was decided that the outputs of the Markets and Funding Subgroup will be for information only to GC0156 but, the outcomes will feed into other codes CUSC most especially.

Future Networks

Objective: To determine further future network requirements that may have implications for Network Operators, TOs, OFTOs and CATOs to facilitate how the industry can meet the requirements of the ESRS.

Assurance Activities

Objective: To develop the assurance framework and performance monitoring framework, to enable Industry performance against the ESRS.

Communications Infrastructure

Objective: To propose changes to the telecommunication requirements for Network Operators, TOs, OFTOs, DNOs, Restoration Service Providers and any other relevant parties required to facilitate the implementation of the ESRS.

The NGESO Representative advised the Workgroup that December 2026 deadline is challenging to get the required technologies in place, and the costs are unlikely to be determined within the set timeframe to complete subgroup meetings.

Markets and Funding Mechanism

Objective: To estimate costs (if possible) associated with the activities to implement the ESRS requirements; advise the CUSC/BSC Panels of the funding implications for relevant stakeholders/parties, advise the GC0156 Workgroup on costs on other parties involved in facilitating the implementation of ESRS and suggest how these should be accommodated.

Full details of the subgroups Terms of Reference and outcomes are available in Annex 4

## Draft legal text

The legal drafting for this modification was achieved by a collaborative approach between the NGESO and Distribution Code Administrator. Also, it was noted that the CATOs have currently been excluded from the drafting of this modification as this is expected to be picked up as part of the CATO modification proposal raised at the Grid Code Review Panel in September 2022.

The draft legal text for this change can be found in Annex 5.

What is the impact of this change?

## Proposer’s assessment against Code Objectives

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| **Proposer’s assessment against Grid Code Objectives** | |
| **Relevant Objective** | **Identified impact** |
| (a) To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity | **Positive**  Provides a level playing field for Restoration Service Providers and CUSC Parties and to put measures in place to restore the NETS as soon as possible following a total or partial national power outage. |
| (b) Facilitating effective competition in the generation and supply of electricity (and without limiting the foregoing, to facilitate the national electricity transmission system being made available to persons authorised to supply or generate electricity on terms which neither prevent nor restrict competition in the supply or generation of electricity); | **Positive**  Competition for Restoration Services is encouraged via the tender process to ensure a good availability of services at strategically located points which provides value for money. |
| (c) Subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution systems in the national electricity transmission system operator area taken as a whole; | **Positive**  Provide assurance of restoring the System following a total or partial national power outage as quickly as possible |
| (d) To efficiently discharge the obligations imposed upon the licensee by this licence  and to comply with the Electricity Regulation and any relevant legally binding decisions of the European Commission and/or the Agency; and | **Positive**  Provide assurance that the new licence obligation issued in Oct 2021 can be satisfied and discharged. |
| (e) To promote efficiency in the implementation and administration of the Grid Code arrangements | **Neutral** |

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| --- | --- |
| Proposer’s assessment of the impact of the modification on the stakeholder / consumer benefit categories | |
| **Stakeholder / consumer benefit categories** | **Identified impact** |
| Improved availability of the system | Positive  It is in the widest possible interest of the country and consumers as a whole to restore power supplies as soon as possible following a total or partial shutdown. This modification seeks to do that and therefore seen as positive. |
| Lower bills than would otherwise be the case | Positive  The financial implications of a national power outage can run into many tens of millions of pounds very quickly. Restoring power supplies as soon as possible and in the shortest possible time frame is essential to the country as a whole. Whilst not having a direct effect on consumer bills the loss of production for business and the wider community would be substantial and therefore insurance to minimise against the risk of a power outage is imperative. |
| Benefits for society as a whole | Positive  This proposal puts measures in place that would reduce the time taken to restore electricity system demand following partial or total national power outage. This is a significant benefit to society as a whole. |
| Reduced environmental damage | Positive  This proposal will support the use of a diverse range of technologies, many of which are low carbon sources. The proposal also recognises the important role of all technologies following a Total or Partial shutdown and therefore this modification is seen as a net positive in minimising environmental damage. |
| Improved quality of service | **Positive**  This modification provides the potential for Restoration from renewable sources in addition to encouraging the use of embedded generation which is currently being trialled through the distributed restart project. |

When will this change take place?

### Implementation date

January 2023

### Date decision required by

December 2022

### Implementation approach

New Restoration Decision Support Tool, Restoration Tool, Local Joint Restoration Plans, Distributed Restoration Zone Plans & Annual Restoration Strategy.

Interactions

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| --- | --- | --- | --- |
| CUSC | BSC | STC | SQSS |
| European Network Codes | EBR Article 18 T&Cs[[1]](#footnote-2) | Other modifications | Other |

How to respond

## Standard Workgroup consultation questions

1. Do you believe that GC0156 Original proposal better facilitates the Applicable Objectives?
2. Do you support the proposed implementation approach?
3. Do you have any other comments?
4. Do you wish to raise a Workgroup Consultation Alternative request for the Workgroup to consider?

## Specific Workgroup consultation questions

1. Xxxxxxxxx
2. Xxxxxxxxxx

The Workgroup is seeking the views of Grid Code Users and other interested parties in relation to the issues noted in this document and specifically in response to the questions above.

Please send your response to [grid.code@nationalgrideso.com](mailto:grid.code@nationalgrideso.com)using the response pro-forma which can be found on the [GC0156](https://www.nationalgrideso.com/electricity-transmission/industry-information/codes/grid-code-old/modifications/gc0156-implementation-electricity-system) modification page.

In accordance with Governance Rules if you wish to raise a Workgroup Consultation Alternative Request please fill in the form which you can find at the above link.

*If you wish to submit a confidential response, mark the relevant box on your consultation proforma. Confidential responses will be disclosed to the Authority in full but, unless agreed otherwise, will not be shared with the Panel, Workgroup or the industry and may therefore not influence the debate to the same extent as a non-confidential response.*

Acronyms, key terms and reference material

|  |  |
| --- | --- |
| **Acronym / key term** | **Meaning** |
| BEIS | Department for Business, Energy and Industrial Strategy |
| BSC | Balancing and Settlement Code |
| CATO | Competitively Appointed Transmission Owners |
| CUSC | Connection and Use of System Code |
| DNO | Distribution Network Operator |
| EBR | Electricity Balancing Regulation |
| ESRS | Electricity System Restoration Standard |
| EU | European Union |
| GC | Grid Code |
| GCRP | Grid Code Review Panel |
| NETS | National Electricity Transmission System |
| NGESO | National Grid Electricity System Operator |
| RSP | Restoration Service Providers |
| STC | System Operator Transmission Owner Code |
| SQSS | Security and Quality of Supply Standards |
| OFTO | Offshore Transmission Owner |
| T&Cs | Terms and Conditions |
| TO | Transmissions Owner |
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### Reference material

* Not applicable

Annexes

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| **Annex** | **Information** |
| Annex 1 | Proposal form |
| Annex 2 | Terms of Reference |
| Annex 3 | ESRS Steering Group Recommendations |
| Annex 4 | Subgroup Terms of Reference and Reports |
| Annex 5 | Draft Legal Text |

1. If your modification amends any of the clauses mapped out in Annex GR.B of the Governance Rules section of the Grid Code, it will change the Terms & Conditions relating to Balancing Service Providers. The modification will need to follow the process set out in Article 18 of the Electricity Balancing Regulation (EBR – EU Regulation 2017/2195). All Grid Code modifications must be consulted on for 1 month in the Code Administrator Consultation phase, unless they are Urgent modifications which have no impact on EBR Article 18 T&Cs. N.B. This will also satisfy the requirements of the NCER process. [↑](#footnote-ref-2)