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Workgroup Consultation

GSR032: Implementation of the Electricity System Restoration Standard

Overview: This Modification is proposing a number of changes to the SQSS to facilitate the direction issued by BEIS[1] 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 electricity demand to be restored within 24 hours in all regions, and 100% of electricity demand to be restored within 5 days nationally.

Modification process & timetable

1. **Proposal Form** — 16 March 2023
2. **Workgroup Consultation** — 31 May 2023 - 20 June 2023
3. **Workgroup Report** — 04 July 2023
4. **Code Administrator Consultation** — 17 July 2023 - 07 August 2023
5. **Draft Modification Report** — 05 September 2023
6. **Final Modification Report** — 25 September 2023
7. **Implementation** — TBC

Have 5 minutes? Read our Executive summary

Have 20 minutes? Read the full Workgroup Consultation

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 Transmission Owners and Offshore Transmission Owners (**No Impact** on existing OFTO network)

Governance route	Standard Governance modification with assessment by a Workgroup	
Who can I talk to about the change?	**Proposer:** Sade Adenola Sade.adenola@nationalgrideso.com Phone: 07748180789	**Code Administrator Chair**: Milly Lewis milly.lewis@nationalgrideso.com Phone: 07811036380
How do I respond?	Send your response proforma to box.sqss@nationalgrideso.com **by 5pm on 20 June 2023**	

[1] BEIS is now referred to as Department for Energy Security and Net-Zero (DESNZ)

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Executive summary

This Modification is proposing a number of changes to the Security and Quality of Supply Standard (SQSS) to facilitate the direction issued by BEIS[1] 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 electricity demand to be restored within 24 hours in all regions, and 100% of electricity demand to be restored within 5 days nationally.

What is the issue?

The modification is necessary to implement the Electricity System Restoration Standard (ESRS) issued by BEIS. The date by which BEIS[1] 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: The Proposer suggested that the SQSS may need to be changed to reflect the requirements of the ESRS. The issue was discussed amongst the SQSS Panel, and it was agreed a Workgroup should be established to consider if the SQSS needed to be changed. The Proposer has suggested minor changes to the SQSS through the introduction of an Appendix I which specifically addresses the requirements for System Restoration. These changes complement other changes being introduced to the Grid Code and STC.

Implementation date: 10 working days following The Authority decision.

This would provide clear obligations on parties so the requirements of the ESRS can be met by 31 December 2026.

What is the impact if this change is made?

This modification is as a consequence of the GC0156 Facilitating the Implementation of the Electricity System Restoration Standard and as such will impact Transmission Owners including future Offshore Transmission Network (existing OFTOs are exempt from retrospective GSR032 changes). Modification of SQSS with inclusion of restoration requirements.

Interactions

There are a suite of modifications related to the implementation of the Electricity System Restoration Standard; Grid Code GC0156; CUSC CMP398 and CMP412; BSC P451; STC-P changes PM0128 and STC CM089.

What is the issue?

In April 2021, the Department for Business, Energy and Industrial Strategy (BEIS[1]) released a policy statement setting out the need to introduce a legally binding target for the restoration of electricity supplies in the event of a total or partial shutdown of the National Electricity Transmission System (NETS) .

This new policy is called the Electricity System Restoration Standard (ESRS). As a consequence of BEIS's policy statement, Ofgem performed an initial consultation in April 2021 followed by a statutory consultation 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 stating that they made the decision to make the licence modifications[2]. The modification decisions are publicly available and were implemented on 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".
- 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.

Why change?

This Modification is proposing changes to the SQSS to facilitate the direction issued by BEIS 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 electricity demand to be restored within 24 hours in all regions, and 100% of electricity demand to be restored within 5 days nationally[3].

The SQSS requires further review to ensure it is consistent with the changes being introduced to the Grid Code and STC to facilitate the implementation of the ESRS.

[2] Which can be found via this link: Decision on Licence modifications to facilitate the introduction of an Electricity System Restoration Standard | Ofgem

[3] BEIS later specified that "electricity Demand" should be calculated as the forecast peak "Transmission Demand" in the 24 hours after a Shutdown.

What is the solution?

Proposer's solution

It is proposed to establish a SQSS modification Working Group to determine how implementation of the Electricity System Restoration Standard (ESRS) can be facilitated by code modifications.

This modification will build on the work completed through the implementation of the EU Emergency and Restoration Code[4] (EU 2017/2196) which was in part introduced to the Grid Code through Grid Code modifications GC0125, GC0127 and GC0128 and further being implemented through Grid Code modification GC0148 (Implementation of EU Emergency and Restoration Code Phase II) and GC0156 (Facilitating the Implementation of the Electricity System Restoration Standard).

This modification includes the following proposals for Transmission Owners to consider the following issues when designing their networks.

I.1 These key requirements apply to *onshore transmission systems.* In the case of *offshore transmission systems,* the requirements of this Appendix I would only be applied to those *offshore transmission systems* who had concluded design contracts for their assets on or after XXXX *(12 months after approval of CM089 for example if Ofgem approve CM089 on 01/12/2023 then XXXX would become 01/12/2024)*.

I.1.1 Each *transmission system* shall be designed to facilitate participation in a *restoration plan* as appropriate including but not limited to reactive gain and the ability for generation to energise sections of the transmission system.

I.1.2 In addition to the requirements of I1.1, each *transmission system* shall be designed to permit *power stations* to be subsequently synchronised to the *transmission system* and operated within their normal operational capability limits.

I.1.3 The no load gain between adjacent substations shall be designed to prevent system collapse during restoration.

Workgroup considerations

The Workgroup convened 4 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.

Consideration of the proposer's solution

Updates to the SQSS

The ERSR subgroups (sub-group reports in Annex 3) which were formerly established prior to the formal implementation of the Industry Codes (i.e., Grid Code, STC, CUSC, BSC, SQSS) identified potential changes to the SQSS. These were presented to the SQSS

[4] Commission Regulation (EU) 2017/2196 of 24 November 2017 establishing a network code on electricity emergency and restoration (Text with EEA relevance) (legislation.gov.uk) &
The Electricity Network Codes and Guidelines (System Operation and Connection) (Amendment etc.) (EU Exit) Regulations 2019

Panel in March 2023 and again in April 2023 where it was agreed the issue should proceed to Workgroup.

A key point raised was whether there needed to be a change to the SQSS to include System Restoration noting that Licence Standards do not apply during a System Restoration.

The draft legal text developed by the Workgroup reflects the minimal requirements that are believed to be introduced into the SQSS to include a System Restoration capability and does not include specific references to relevant clauses/sections of the Grid Code and STC.

The Workgroup had differing views on the inclusion of paragraph Appendix I.1.3. A Workgroup member suggested that the requirements of this paragraph were already covered by Appendix I.1.1 and Appendix I.1.2 and that it was therefore not required. The reasoning was that preventing a collapse of the partially restored system was implicit in Appendix I.1.1 and Appendix I.1.2.

Other Workgroup members asked if specific reference should be made to "voltage collapse" to capture the design requirement to match the reactive power demand of the network to the generator capability, rather than the more general "system collapse". It was agreed that a specific Workgroup consultation question should be included on paragraph Appendix I.1.3.

The Proposer clarified that for restoration purposes, Electricity Demand is based on the Grid Code definition of National Demand.

National Demand	The amount of electricity supplied from the **Grid Supply Points** plus:- • that supplied by **Embedded Large Power Stations**, and • **National Electricity Transmission System Losses**, minus:- • the **Demand** taken by **Station Transformers** and, **Pumped Storage Units'** and **Electricity Storage Modules'**. and, for the purposes of this definition, does not include:- • any exports from the **National Electricity Transmission System** across **External Interconnections**.

Obligation, representation, and retrospectivity

The Proposer confirmed that existing OFTOs are exempt from retrospective ESRS changes for those offshore transmission systems who had concluded design contracts for their assets on or after XXXX (12 months after approval of CM089 for example if Ofgem approve CM089 on 01/12/2023 then XXXX would become 01/12/2024).

It was confirmed that all existing and future onshore operations would need to be compliant with the ESRS requirements.

The Workgroup suggested that OFTO developers are required to be part of this discussion as they will be involved in implementing any standards to future-proof infrastructure etc. The ESO rep outlined that onshore TOs and DNOs have been involved in ESRS discussions to date, more developers joined at Workgroup 3.

Consideration of other options

Loading capacity

The Workgroup queried what the expectations for restarting generation in the event of a significant outage event were– i.e., that restarting would need to be at the lowest output to avoid instability issues. It was confirmed that block loading capacity is covered in contracts and not in scope for this Workgroup.

Impact assessments and cost considerations resulting from the modification

Some Workgroup members raised concerns about the cost implications of meeting the standards across the whole network (e.g., there is no cost recovery mechanism defined for OFTOs yet). The ESO team acknowledged that to meet the new standards, investments will be required across the industry, the ESO included, and shared that Ofgem have been engaged on this point.

The Workgroup recognised that it is impractical to require all parts of the Transmission System to have a Restoration Capability. However, System Restoration needs to be considered at the design and operational stages, in particular the ability to ensure Generators or interconnectors or other parties who wish to offer a Restoration Capability can do so. Therefore, the draft text has been very specific in defining the need for the Transmission System to facilitate System Restoration through Restoration Plans and the subsequent wider expansion of the System.

The Workgroup acknowledged that whilst ensuring that license standards do not apply during System Restoration, the conditions are such that plant and apparatus is not tripped because of the extreme operating conditions.

A question was raised as to whether the modification will result in a blanket change across the whole network or whether implementation of these requirements would be targeted (at first at least) – i.e., sections of the network targeted and tested prior to a blanket roll-out across the network. As a blanket implementation would have significant impacts on TOs and license holders, the group raised the importance of TOs understanding the implications of the ESRS changes and the duty of care to customers to balance against the changes needed. The ESO agreed that impacts would need to be scoped but the ESRS changes are required to meet a license obligation therefore, the need to implement the requirements remains unchanged.

In response to the request for more design specifications to help assess the impact of the changes across the network the ESO did confirm that they had received a request to remove some specific details during earlier ESRS discussions.

The Workgroup raised a need for an impact assessment to understand the implications for compliance (including the network's current compliance status) and the impact to investment plans from this change. When ESO asked whether the workgroup could deliver such numbers to inform the discussion, the Workgroup suggested that impacts could be shared but not costs.

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Draft legal text

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

What is the impact of this change?

Proposer's assessment against SQSS Objectives	
Relevant Objective	**Identified impact**
(i) facilitate the planning, development, and maintenance of an efficient, coordinated, and economical system of electricity transmission, and the operation of that system in an efficient, economic, and coordinated manner;	**Positive** The SQSS is introducing robust network design to support the ability to restore the network following a total or partial shutdown.
(ii) ensure an appropriate level of security and quality of supply and safe operation of the National Electricity Transmission System;	**Positive** Proposed changes would ensure stability of Power Islands by restoring sufficient demand during system restoration.
(iii) facilitate effective competition in the generation and supply of electricity, and (so far as consistent therewith) facilitating such competition in the distribution of electricity; and	**Neutral**
(iv) facilitate electricity Transmission Licensees to comply with any relevant obligations under EU law	**Positive** Provide assurance of restoring the System following a total or partial national power outage.

Do you believe that GSR Original proposal better facilitates the Applicable Objectives?

When will this change take place?

Implementation date
10 working days following The Authority decision.

This would provide clear obligations on parties so the requirements of the ESRS can be met by 31 December 2026.

Date decision required by
Q3 2023.

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Implementation approach

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

Do you support the implementation approach?

Interactions

☒ Grid Code	☒ BSC	☒ STC	☒ CUSC
☒ European Network Codes	☒ Other modifications		

How to respond

Standard Workgroup consultation questions

1. Do you believe that the Original Proposal better facilitate the Applicable Objectives?
2. Do you support the proposed implementation approach?
3. Do you have any other comments?

Specific Workgroup consultation questions

4. Do you believe it is appropriate to include clarifications within the SQSS to define the system restoration capability requirements as drafted?
5. Do you believe that there are any further requirements that should be considered during the network design phase?
6. Is it clear that Appendix I.1.2 applies only to the post restoration plan phase, including energisation of the next user on the network, restoration of auxiliary supplies or subsequent energisation of other parts of the transmission system?
7. Do you believe that clause Appendix I.1.3 (reference to no load gain) is required as part of modification?

The Workgroup is seeking the views of SQSS 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 box.sqss@nationalgrideso.com using the response pro-forma which can be found on the SQSS 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
CMP	CUSC Modification Proposal
CUSC	Connection and Use of System Code
DESNZ	Department for Energy Security and Net-Zero
EBR	Electricity Balancing Guideline
ESO	Electricity System Operator
ESRS	Electricity System Restoration Standard
EU	European Union
GC	Grid Code
NETS	National Electricity Transmission System
OFTO	Offshore Transmission System
SEL	Stable Export Limit
SQSS	Security and Quality of Supply Standards
STC	System Operator Transmission Owner Code
T&Cs	Terms and Conditions
TO	Transmissions Owner

Reference material

- GC0156 Modification

Annexes

Annex	Information
Annex 1	Proposal form
Annex 2	Terms of reference
Annex 3	ESRS Subgroup Reports
Annex 4	Workgroup assessment on assurance activity
Annex 5	Draft legal text