Grid Code Code Administrator Consultation

GC0142
Adding Non-Standard Voltages to the Grid Code

This Modification is seeking to clarify the requirements that will be placed on equipment at non-standard voltages e.g. 220kV. A separate Modification GSR026 to modify the SQSS is being progressed in parallel.

Modification process & timetable

1. **Proposal Form**
   - 02 April 2020
2. **Code Administrator Consultation**
   - 13 July 2020 - 14 August 2020
3. **Draft Code Modification Report**
   - 27 August 2020
4. **Final Code Modification Report**
   - 14 September 2020
5. **Implementation**
   - 10 Working Days after decision letter

Have 5 minutes? Read our Executive summary

Have 20 minutes? Read the full Code Administrator document

Have 30 minutes? Read the full Code Administrator document and annexes

Status summary: Code Administrator Consultation. We are now consulting on this proposed change.

This modification is expected to have a:	**Medium:** Any users subject to requirements of the Grid Code installing equipment at novel voltages, who will gain clarity. **Low:** Users subject to requirements of the Grid Code of equipment at standard voltages who will see no change.	
Governance route	The Grid Code Panel agreed that this modification should proceed to Code Administrator Consultation and Ofgem will make the decision on whether it should be implemented.	
Who can I talk to about the change?	**Proposer:** Louise Trodden, National Grid ESO **Phone:** 07866 165538 **Email:** louise.trodden@nationalgrideso.com	**Code Administrator:** Shazia Akhtar, National Grid ESO **Phone:** 07787266972 **Email:** Shazia.Akhtar2@nationalgrideso.com
How do I respond?	Send your response proforma to grid.code@nationalgrideso.com **by 5pm on 14 August 2020**	

Executive Summary

This modification is running alongside the SQSS modification GSR026[1] which is also currently at Code Administrator Consultation stage. These modifications have been raised in response to a previously rejected SQSS modification GSR021[2]. Both modifications seek to include non-standard voltages which are currently not specified in Grid Code or the SQSS and align them where possible. GSR026 will also align the term 'Supergrid' with the Grid Code.

What is the issue?

The Grid Code currently only references the specification and performance requirements for adding equipment of the following voltages to the Grid: 400kV, 275kV and 132kV. Future technical advancements and equipment of other nominal voltage specifications and requirements are not defined in the Code. 220kV is a common EU transmission voltage. It is possible that this, along with equipment of other common voltages (e.g. 380kV, 110kV) could be connected to the GB system in the near future.

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

Proposers solution:

To remove references to specific nominal voltages from relevant clauses of the Grid Code, and replace them with a table of voltage ranges, similar to that in the EU codes. This will ensure that current and future voltages within the transmission network have clear specification and performance requirements.

The same solution will be applied to SQSS via GSR026.

Implementation date:

Implementation is expected 10 working days following decision being confirmed.

What is the impact if this change is made?

Who will it impact?

Medium: Any users subject to requirements of the Grid Code installing equipment at novel voltages.

Low: Users subject to requirements of the Grid Code of equipment at standard voltages who will see no change.

Interactions

This modification allows for consistency with the changes being proposed to the SQSS under GSR026.

[1] https://www.nationalgrideso.com/industry-information/codes/security-and-quality-supply-standards-old/modifications/gsr026-adding

[2] https://www.nationalgrideso.com/codes/security-and-quality-supply-standards/modifications/gsr021-operational-and-planning-criteria

Code Administrator Consultation Introduction

This document is the GC0142 **Code Administrator Consultation.** This document outlines;

- **What is the issue?**
- **What is the solution?**
  - Proposer's solution
  - Draft legal text
- **What is the impact of this change?**
- **When will the change taken place?**
- **How to respond**
- **Acronym table and reference material**

We are seeking views on the proposed change. The questions it is seeking answers on are embedded within the document and outlined in the **How to respond** section.

What is the issue?

A previous modification (GSR021) to include 220kV assets into the SQSS was rejected by Ofgem in July 2016. This was for the following reasons:

- There were concerns regarding the original proposal having only considered the addition of 220kV as a nominal voltage and did not cover future technological advancements or subsequent new voltage rates.
- The original proposal was also not detailed enough to differentiate how both on and offshore voltages were reported in chapter 6 and chapter 10 of the SQSS.

These assets are currently situated at the Kintyre-Hunterston subsea AC link with two subsea cables between Crossaig on the Kintyre peninsula and Hunterston. The connection to the Onshore transmission system is via two 400/20kV supergrid transformers at Hunterston and via two 200/132kV transformers at Crossaig. Whilst there is currently no user equipment directly affected by the new voltage, 220kV assets are not currently specified within the Grid Code.

This defect remains however, this modification now seeks to expand the Grid Code to clarify the requirements that will be placed on equipment at non- standard voltages. For reference, currently 400kV, 275kV and 132kV are voltages typically referred to within the Grid Code. This means that any other nominal voltage specifications and requirements are not defined in code.

The proposed changes to the Grid Code should ensure that current and future voltages within the transmission network have clear specification and performance requirements. By including specifications for voltages in such a way that will enable consistency for both the Grid Code and the SQSS.

What is the solution?

Proposer's solution:

This modification will update the Grid Code to ensure that nominal voltages other than those used as standard in GB (132kV, 275kV, 400kV) can be accommodated for equipment connecting to the transmission system.

Draft Legal text

When drafting the legal text, consideration was given to whether there should be modifications to the Connection Conditions (CC) section of the Grid Code and European Connection Conditions (ECC). Changing the CC sections of the Grid Code could aid readers of the code to see the consistency in the texts. However, on reflection those users who have existing connections may see the existing requirements presented differently, causing confusion. Therefore, it is the view of the proposer that we only make the modification applicable to the European Connection Conditions (ECC).

Reviewing the current version of the Grid Code, it became apparent that there were two Electrical Standards which could require a change, these have been highlighted to the TOs for their review. These are indicated below:

The Electrical Standards are as follows: ANNEX TO THE GENERAL CONDITIONS	Current Transformers for Protection and General Use on the 132kV, 275kV and 400kV Systems
The Electrical Standards are as follows: (d) Scottish Electrical Standards for SHETL's Transmission System.	6. NGTS 3.2.3: Metal-Oxide surge arresters for use on 132, 275 and 400kV systems. Issue 2 May 1994. 7. NGTS 3.2.4: Current Transformers for protection and General use on the 132, 275 and 400kV systems. Issue 1 September 1992. 8. NGTS 3.2.5: Voltage Transformers for use on the 132, 275 and 400 kV systems. Issue 2 March 1994. 9. NGTS 3.2.6: Current and Voltage Measurement Transformers for Settlement Metering of 33, 66, 132, 275 and 400kV systems. Issue 1 September 1992.

It is important to note that in ECC6.1.7 Table ECC.6.7.1(b) — Planning levels for flicker, the requirements for systems operating at a nominal voltage between 33kV and 66kV is not clear. The requirements and specification for railway voltages at 25kV (note this is a phase to neutral voltage which would be equivalent to 43kV phase to phase voltage) could be impacted by this. This lack of clarity exists in the present format of the table, and in the revised table for this modification. Given that addressing this would be out of scope of this modifications defect, and that there is currently work ongoing for P24, the view of the Proposer is to review this in the P24 working group for resolution.

It is also of note that, the term ‘Supergrid Voltage’ has been retained as a defined Grid Code term in the revisions to the legal text for Schedule 5. This is a historic term used in the Grid Code for any voltage greater than 200kV. Irrespective of a User being either a GB Code User or an EU Code User, the term “Supergrid Voltage” still refers to voltages greater than 200kV and therefore reference to this term would make no difference to User’s submitting data relating to equipment which operates at a nominal voltage other than 132kV, 275kV or 400kV. The ESO believes that it would not be appropriate to remove the term ‘Supergrid Voltage’ on the basis of i) the potential for unintended consequences which

could result from this change ii) its impact on the wider GB codes and iii) its removal has no materiality on the data that Users are required to provide irrespective of the nominal voltage that the equipment is operating at.

The draft legal text for this change can be found in Annex 2 of this report.

What is the impact of this change?

Who will it impact?

Current and future parties that are subject to requirements of the Grid Code when connecting to the transmission system and installing equipment of non-standard GB voltages.

What are the positive impacts?

These changes aim to make it clearer for those connecting to the transmission system what performance and specification should be followed at each nominal voltage. Additionally, this modification allows for consistency with the changes being proposed to the SQSS.

What are the negative impacts (if any)?

None identified

Proposer's Assessment against Code Objectives

Grid Code:

Impact of the modification on the 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
(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
(c) Subject to sub-paragraphs (a) and (b), 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
(d) To efficiently discharge the obligations imposed upon the licensee by this license and to comply with the	Positive

Electricity Regulation and any relevant legally binding decisions of the European Commission and/or the Agency; and	
(e) To promote efficiency in the implementation and administration of the Grid Code arrangements	Neutral

Code Administrator Consultation question: Do you believe that the Original proposal better facilitates the Applicable Grid Code Objectives?

When will this change take place?

Implementation date:

Implementation should take place 10 days after decision has been finalised.

Implementation approach:

Implementation of this modification will only require minor amendments to the legal text of the Grid Code and with alignment to a similar change being taken forwards in the SQSS under GSR026.

Implementation should occur as standard on completion of the modification and approval by Ofgem. The application should apply to all new and existing equipment but no changes in costs for specifications or system changes are envisaged. SSE have confirmed that the equipment currently installed (Kintyre-Hunterston) can comply with the operational limits specified.

Code Administrator Consultation question: Do you support the implementation approach?

How to respond

Code Administrator Consultation questions:

1. Do you believe that the GC0142 Original proposal better facilitates the Applicable Grid Code Objectives?
2. Do you support the proposed implementation approach?
3. Do you have any other comments?

Please send your response to grid.code@nationalgrideso.com using the response pro-forma which can be found on the National Grid ESO website via the following link: https://www.nationalgrideso.com/industry-information/codes/grid-code-old/modifications/gc0142-adding-non-standard-voltages-grid

If you wish to submit a confidential response, please note that information provided in response to this consultation will be published on National Grid ESO's website unless the response is clearly marked "Private & Confidential", we will contact you to establish the extent of the confidentiality. A response marked "Private & Confidential" will be disclosed to the Authority in full but, unless agreed otherwise, will not be shared with the CUSC Modifications Panel or the industry and may therefore not influence the debate to the same extent as a non-confidential response. Please note an automatic confidentiality disclaimer generated by your IT System will not in itself, mean that your response is treated as if it had been marked "Private and Confidential".

Acronym table and reference material

Acronym	Meaning
ESO	Electricity System Operator
SQSS	Security and Quality of Supply Standard
TO	Transmission Owner

Annexes

Annex	Information
Annex 1	GC0142 Original Proposal Form
Annex 2	Annex 2 – Legal Text