nationalgrid

Stage 01: Modification Proposal

Grid Code

GC108: EU Code: Emergency & Restoration: Black start testing requirement

Purpose of Modification: This modification seeks to align the GB Grid Code with the European Emergency and Restoration code. The purpose of this proposal is to align and regulate the testing of black start stations across the two codes.

The Proposer recommends that this modification should be:

- subject to self-governance and proceed to Code Administrator Consultation

This modification was raised *14th February 2018* and will be presented by the Proposer to the Panel on *22nd February 2018.* The Panel will consider the Proposer's recommendation and determine the appropriate route.

High Impact: *Transmission System Operators (TSOs) and black start providers. This modification is linked to TSO compliance with EU Regulation 2017/2196 (Emergency and Restoration).*

Medium Impact: *None*

Low Impact: *None*

What stage is this document at?

01	Modification Proposal
02	Code Admin Consultation
03	Draft Final Modification Report
04	Final Modification Report

Contents

Timetable

The Code Administrator will update the timetable. This will be discussed at the Panel meeting being held on 22 February 2018 and updated following the Panel decision on the Governance route.

Workgroup Meeting 1	dd month year
Workgroup Meeting 2	dd month year
Workgroup Meeting 3	dd month year
Workgroup Report presented to Panel	dd month year
Code Administration Consultation Report issued to the Industry	dd month year
Draft Final Modification Report presented to Panel	dd month year
Modification Panel decision	dd month year
Final Modification Report issued the Authority	dd month year
Decision implemented in Grid Code	dd month year

Any Questions?

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1 Summary

What

Following a code mapping review of the Emergency and Restoration European Network Code undertaken by an industry review group on the 31st January 2017 an amendment to the Grid Code was identified as outlined in this paper to ensure alignment between these requirements and GB frameworks. The code mapping session was an open invitation sent to all parties on the Joint European Stakeholder Group (JESG) distribution list on the 13th January 2017.

The Emergency and Restoration code states that each black start service provider shall execute a black start capability test at least once every three years. Current GB legislation states that this should be tested no more than once every two years. Our position is that a change to align these requirements is necessary. Further information on engagement carried out ahead of raising this modification can be located in the Consumer Impact section of this modification.

Why

The Emergency & Restoration code requires that a system operator produce a system defence plan, to be enacted in the event of significant issues affecting the system. It also requires a restoration plan, detailing the actions to be taken to restore supply in the event that the system enters the Blackout state as defined by SOGL. Finally, it details how the defence and restoration capabilities should be tested for compliance.

Currently the system defence and system restoration plans are under development within National Grid and it is not expected that these will raise any further Grid Code Modifications. Details of these plans will be published to stakeholders in due course.

Some clauses in the Emergency and Restoration network code relating to black start service testing frequency are different to current GB practices. Specifically, under EU Regulation Emergency and Restoration 2017/2196 Article 44 Compliance testing of power generating module capabilities is required such that "each restoration service provider which is a power generating module delivering black start service shall execute a black start capability test, at least every three years" and following the methodology laid down in Article 45(5) of EU Regulation 2016/631 Requirements for Generators. This proposal is to make a change to the Grid Code to reflect these requirements.

How

This modification proposes to align the testing requirements set out in the Emergency and Restoration code with GB frameworks by changing the wording in OC5 of the Grid Code to require the testing of power generating modules delivering a black start service at least every three years.

2 Governance

*Justification for **Self-Governance** Procedures*

We consider that this modification should be considered for self-governance procedures as although it will impact the operation of the National Electricity Transmission System, it will only affect a subset of parties who have already been engaged, and the modification describes arrangements which are already in place between NGET and black start service providers. In changing the interval only of testing the modification will align the Grid Code with European law.

Self-Governance - *The modification is unlikely to discriminate between different classes of Grid Code Parties and is unlikely to have a material effect on:*

i) Existing or future electricity customers;

ii) Competition in the generation, distribution, or supply of electricity or any commercial activities connected with the generation, distribution or supply of electricity,

iii) The operation of the National Electricity Transmission System

iv) Matters relating to sustainable development, safety or security of supply, or the management of market or network emergencies

v) The Grid Code's governance procedures or the Grid Code's modification procedures

Requested Next Steps

This modification should:

- be subject to self-governance
- proceed straight to Code Administrator Consultation

3 Why Change?

This Proposal is one of a number of Proposals which seek to implement relevant provisions of a number of new EU Network Codes/Guidelines which have been introduced in order to enable progress towards a competitive and efficient internal market in electricity. Some EU Network Guidelines are still in development and these may in due course require a review of solutions developed for Codes that come into force beforehand. The full set of EU network guidelines are;

- Regulation 2015/1222- Capacity Allocation and Congestion Management (CACM) which entered into force 14 August 2015
- Regulation 2016/1719 – Forward Capacity Allocation (FCA) which entered into force 17 October 2016
- Regulation 2016/631- Requirements for Generators (RfG) which entered into force 17 May 2016
- Regulation 2016/1388 – Demand Connection Code (DCC) which entered into force 7 September 2016
- Regulation 2016/1447 – High Voltage Direct Current (HVDC) which entered into force 28 September 2016
- Transmission System Operation Guideline (TSOG)- which entered into force July 2017.
- Regulation 2017/2196 - Emergency and Restoration (E&R) which entered into force 18 December 2018.

Emergency and Restoration is crucial to the interconnected internal energy market in the UK and specifically maintaining security of energy supply, increasing competitiveness and ensuring that all consumers within EU Member States can purchase energy at affordable prices. This code sets out harmonised rules on how to deal with emergency situations and to restore the system as efficiently and as quickly as possible. The European Network Code Emergency and Restoration will ensure the highest level of system security for Europe.

4 Code Specific Matters

Reference Documents

GB Grid Code
https://www.nationalgrid.com/sites/default/files/documents/8589935310-Complete%20Grid%20Code.pdf

Commission Regulation (EU) 2017/2196 of 24 November 2017 establishing a network code on electricity emergency and restoration:
http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32017R2196

5 Solution

It is proposed that the interval specified in the GB Grid Code for "black start testing" is revised to align with the EU Emergency and Restoration Code. This specifies that power generating modules having black start capability within stations opting to provide black start services should be tested at least once every three years. Current Grid Code provisions are that testing of black start units within a station should occur no more than every year.

6 Impacts and Other Considerations

Who
This impacts black start service providers, NGET and External System Operators.

Which
The black start testing process in the GB Grid Code section OC5, which sets out the testing requirements for black start stations in GB.

Systems impacted
NGET Black Start testing
Black Start service providers

Does this modification impact a Significant Code Review (SCR) or other significant industry change projects, if so, how?

No

Consumer Impacts

This change will facilitate the implementation of the EU Emergency and Restoration code which helps to facilitate a harmonised electricity system as part of the package of European Network Codes, and will help to deliver and facilitate a significant benefit to the end consumer by ensuring security of supply across GB and Europe.

Prior to raising this modification, engagement was carried out at the Joint European Stakeholder Forum on the 12th February 2018. The presentation was given at the link below to advise stakeholders of the upcoming amendment to the Grid Code: (https://www.nationalgrid.com/uk/electricity/codes/european-network-codes/meetings/jesg-meeting-12022018)

Members of the NGET Black Start team attended the Black Start Task Force on the 31st January 2018 to make relevant stakeholders aware of the changes that are being proposed in this Grid Code Modification Proposal. The item was raised under 'any other business' and no objections were made.

Prior to this National Grid Electricity Transmission also attended the Joint European Stakeholder Group on the 9th January 2018 to outline the Emergency & Restoration impacts. The slide pack containing this information can be located below:

https://www.nationalgrid.com/uk/electricity/codes/european-network-codes/meetings/jesg-meeting-09012018

7 Relevant Objectives

Impact of the modification on the Relevant Objectives:	
Relevant Objective	**Identified impact**
To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity	**Positive**
To facilitate 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**
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**
To efficiently discharge the obligations imposed upon the licensee by this license and to comply with the Electricity Regulation and any relevant legally binding decisions of the European Commission and/or the Agency; and	**Positive**
To promote efficiency in the implementation and administration of the Grid Code arrangements	**Neutral**

8 Implementation

The implementation should be in line with the date as described in the European Emergency and Restoration code of the 18th December 2018.

9 Legal Text

It is proposed that the following changes are made to OC5 of the Grid Code:

OC 5.7.1 General

(a) **NGET** may require a **Generator** with a **Black Start Station** to carry out a test (a "**Black Start Test**") on a **Genset** or **Power Generating Module** in a **Black Start Station** either while the **Black Start Station** remains connected to an external alternating current electrical supply (a "**BS Unit Test**") or while the **Black Start Station** is disconnected from all external alternating current electrical

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supplies (a "**BS Station Test**"), in order to demonstrate that a **Black Start Station** has ~~a~~ **Black Start Capability**.

(b) ~~Where~~ **NGET** shall require~~s~~ a **Generator** with a **Black Start Station** to carry out a **BS Unit Test** on each **Genset** or **Power Generating Module** which has **Black Start Capability** within such a **Black Start Station** to demonstrate this capability at least once every three years.~~,~~ **NGET** shall not require the **Black Start Test** to be carried out on more than one **Genset** or **Power Generating Module** at that **Black Start Station** at the same time, and would not, in the absence of exceptional circumstances, expect any of the other **Genset**s **or Power Generating Modules** at the **Black Start Station** to be directly affected by the **BS Unit Test.** This test will be deemed a success where starting from shutdown is achieved within a time frame specified by NGET.

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(c) **NGET** may require a **Generator** with a **Black Start Station** to carry out a **BS Unit Test** at any time (but will not require a **BS Unit Test** to be carried out more than once in each calendar year in respect of any particular **Genset** unless it can justify on reasonable grounds the necessity for further tests or unless the further test is a re-test, and will not require a **BS Station Test** to be carried out more than once in every two calendar years in respect of any particular **Genset** unless it can justify on reasonable grounds the necessity for further tests or unless the further test is a re-test).

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(d) When **NGET** wishes a **Generator** with a **Black Start Station** to carry out a **Black Start Test**, it shall notify the relevant **Generator** at least 7 days prior to the time of the **Black Start Test** with details of the proposed **Black Start Test**.

10 Recommendations

Panel is asked to:

- Agree that Self Governance procedures should apply
- Agree that the modification should proceed to Code Administrator Consultation

Annex 1 – Extracts from European Network Codes

Emergency & Restoration code, EU Reg 2017/2196:

Article 44 - Compliance testing of power generating module capabilities

1. Each restoration service provider which is a power generating module delivering black start service shall execute a black start capability test, at least every three years, following the methodology laid down in Article 45(5) of Regulation (EU) 2016/631.
2. Each restoration service provider which is a power generating module delivering a quick re-synchronisation service shall execute tripping to houseload test after any changes of equipment having an impact on its houseload operation

capability, or after two unsuccessful consecutive tripping in real operation, following the methodology laid down in Article 45(6) of Regulation (EU) 2016/631.

Requirements for Generators Code, EU Reg 2016/631:

Article 45 - Compliance tests for type C synchronous power-generating modules
(NB Note that this also applies to type D generating modules)

5. With regard to the black start capability test the following requirements shall apply:
(a) for power-generating modules with black start capability, this technical capability to start from shut down without any external electrical energy supply shall be demonstrated;
(b) the test shall be deemed successful if the start-up time is kept within the time frame set out in point (iii) of Article 15(5)(a).

6. With regard to the tripping to houseload test the following requirements shall apply:
(a) the power-generating modules' technical capability to trip to and stably operate on house load shall be demonstrated;
(b) the test shall be carried out at the maximum capacity and nominal reactive power of the power-generating module before load shedding;
(c) the relevant system operator shall have the right to set additional conditions, taking into account point (c) of Article 15(5);
(d) the test shall be deemed successful if tripping to house load is successful, stable houseload operation has been demonstrated in the time period set out in point (c) of Article 15(5) and re-synchronisation to the network has been performed successfully.

Article 15 - General requirements for type C power-generating modules
(NB As referenced in article 45.5(b) above; noting that this also applies to type D generating modules)

5. Type C power-generating modules shall fulfil the following requirements relating to system restoration:
(a) with regard to black start capability:
(iii) a power-generating module with black start capability shall be capable of starting from shutdown without any external electrical energy supply within a time frame specified by the relevant system operator in coordination with the relevant TSO;