

Modification proposal:	Grid Code GC0102: EU Connection Codes GB Implementation – Mod 3		
Decision:	The Authority ¹ directs ² that the proposed modification to the Grid Code be made		
Target audience:	National Grid Electricity Transmission PLC (NGET), the Grid Code Review Panel, Grid Code users and other interested parties		
Date of publication:	15 May 2018	Implementation date:	16 May 2018

Background

The European Third Energy Package came into force on 3 September 2009. The Requirement for Generators (RfG), Demand Connection Code (DCC) and High Voltage Direct Current (HVDC) codes are part of a suite³ of European Regulations developed following implementation of the Third Package.⁴

- COMMISSION REGULATION (EU) 2016/631 of 14 April 2016 establishing a network code on requirements for grid connection of generators (RfG) – specifies the technical connection requirements that new generators must abide by.⁵
- COMMISSION REGULATION (EU) 2016/1388 of 17 August 2016 establishing a Network Code on Demand Connection (DCC) – specifies the technical connection requirements that new distribution networks connecting to the transmission system, new demand users connecting to the transmission system and new customers wanting to provide demand side response services, must abide by.⁶
- COMMISSION REGULATION (EU) 2016/1447 of 26 August 2016 establishing a network code on requirements for grid connection of high voltage direct current systems and direct current-connected power park modules (HVDC) – specifies the technical connection requirements that new long distance DC connections, new links between different synchronous areas (eg interconnectors) and new DC-connected generation (eg offshore wind farms) must abide by.⁷

These European Regulations intend to deliver a harmonised set of rules for the operation of the electricity sector in Europe. The European Regulations aim to help ensure security of supply, facilitate the decarbonisation of the energy sector and create a competitive, pan-European market which benefits consumers.

These European Regulations are directly applicable to GB without having to be transposed into our national laws or regulatory frameworks. European Regulations also take precedence in the legal “hierarchy of laws” over domestic law (ie if a domestic law is incompatible with a European Regulation, it is the European law which takes precedence).

In GB we already have existing national technical codes and standards for parties that want to connect to the GB electricity transmission system. The Grid Code covers all material technical aspects relating to connections to, and the operation and use of, the

¹ References to the “Authority”, “Ofgem”, “we” and “our” are used interchangeably in this document. The Authority refers to GEMA, the Gas and Electricity Markets Authority. The Office of Gas and Electricity Markets (Ofgem) supports GEMA in its day to day work. This decision is made by or on behalf of GEMA.

² This document is notice of the reasons for this decision as required by section 49A of the Electricity Act 1989.

³ Collectively referred to as the European Network Codes (ENCs)

⁴ More information on the European Third Energy Package can be found on our website; [link here](#)

⁵ Commission Regulation (EU) 2016/631 of 14 April 2016 establishing a network code on requirements for grid connection of generators (referred to as the RfG); [link here](#)

⁶ Commission Regulation (EU) 2016/1388 establishing a network code on demand connection; [link here](#)

⁷ Commission Regulation (EU) 2016/1447 of 26 August 2016 establishing a network code on requirements for grid connection of high voltage direct current systems and direct current-connected power park modules (referred to as the HVDC); [link here](#)

national electricity transmission system. In accordance with our decision to incorporate the new EU requirements within the existing GB regulatory frameworks⁸, this modification seeks to amend the Grid Code to make it consistent with the European Network Codes. This will provide accessibility and familiarity to GB parties, and utilises the existing code governance processes to apply the new requirements in a transparent and proportionate way.

It is important to note that until we formally leave the EU and the terms of the exit are established, we will continue to participate constructively in EU institutions and the European Internal Energy Market (IEM). We will also continue to comply with and implement EU laws.

This decision letter should be read in conjunction with our decisions on GC0100, GC0101, and GC0102/DCRP as together they implement the requirements of the RfG and HVDC codes in the Grid and Distribution Codes.

The modification proposal

GC0102 seeks to implement:

- the System Management parameters, as set out in RfG and HVDC, and
- the compliance requirements, as set out in the RfG and HVDC.

Detailed code mapping is available in an annex to the modification. In this decision letter we highlight the key areas of change.

System Management

The technical areas handled under this section of the modification include the following:

- Automatic reconnection
- Control schemes
- Protection
- Operational metering
- Monitoring
- Automatic disconnection
- Simulation models
- Additional devices for system security
- Rates of change of active power
- Neutral earthing arrangements
- Synchronisation

Type A and Type B System Management

A key issue faced by implementation of the RfG in the Grid Code is for generators in the Type A and Type B range (<10MW, see GC0100) as these generators have not been covered under the Grid Code before. The requirements for these generators have been largely incorporated within the relevant sections of the existing Grid Code. Where they are not addressed in the Code directly, such as site specific requirements, they are handled in a fashion consistent with the RfG through Bilateral Agreements.

Type C System Management

Largely the RfG and HVDC codes' requirements for Type C generators are already in place in the Grid Code or through Bilateral Agreements, for site specific requirements.

⁸ Implementing the Electricity EU Network Codes, 18 December 2014; [Link here](#)

Nevertheless implementing some of the requirements will still involve modifying certain provisions of the Grid Code, for example:

- In areas of Dynamic System Monitoring the requirement has been changed from sites 5 times Large Generators to Type C, this has been updated.
- In Simulation/Modelling there is a requirement that can allow the System Operator to request electromagnetic transient simulations.

Type D System Management

Requirements for Type D generators are in place in the Grid Code or through site specific Bilateral Agreements already; however there are areas where modification to the Grid Code is required. An example would be requirements for synchronisation and power oscillation damping control for power park modules. These are being moved from their existing areas to the new European Connection Code section to improve clarity.

HVDC System Management

Largely the requirements for HVDC are already in place in the Grid Code however some areas needed change. The HVDC code specifies that an HVDC system should limit the loss of active power into a synchronous area by co-ordination between TSOs. This requirement is already covered within the SQSS where the limit is set at 1800MW. The Grid Code has been updated to reflect this figure. The Grid Code has existing requirements for: interactions between HVDC systems & other plant, subsynchronous torsional interaction and HVDC system robustness. However there are some differences that have required updating to reflect the HVDC code requirements.

Compliance

Both the RfG and HVDC codes have requirements for ensuring compliance with the Codes' technical requirements. The compliance process has been part of the Grid Code since 2012 and largely handles the RfG and HVDC requirements. However where necessary, the existing compliance process has been updated.

Type A

The RfG requires Equipment Certificates to be used for mass market generating modules; these certificates will prove compliance with the requirements of the RfG. However at present there is no process for creating these certificates. As a result the Grid Code will implement this requirement by utilising existing Manufacturer self-generated test certificates.

Type B & C

RfG requires Type B and C generators to demonstrate compliance through completion of a Power Generating Module Document (PGMD). Upon receiving a suitably completed PGMD the generator will be issued with a Final Operational Notice (FON). The Original modification saw a deficiency in this system that the System Operator would be unaware of the operational status of the generator until the issuing of the FON. Therefore the Original Proposal included a Preliminary Operational Notice (PON) stage to bridge the gap and allow notification of synchronisation and relevant testing.

At the working group an alternative proposal (WACM1) was raised by SSE. WACM1 asserted that the inclusion of the PON was more onerous and unnecessary for implementation of the RfG; this is discussed further in a later section of this letter. Through consultation and working group discussion the Original modification was altered to remove the PON and include the existing practice of issuing: Energisation Operational Notification (EON), Interim Operational Notification (ION) and ultimately FON. The final version of the Original

Modification utilises the EON, ION and FON route for notification of compliance by a generator for Type B & C.

Type D

The existing requirements will largely continue with the inclusion at the ION stage of a 24 month limit.

The Grid Code Review Panel (GCRP) recommendation

At the GCRP meeting of 8 February 2018, the GCRP agreed that both the Original modification and WACM1 better facilitate the Grid Code objectives with the unanimous view that the Original modification is best and should be implemented.

Our decision

We have considered the issues raised by the modification proposal and in the Final Report dated 20 February 2018. We have considered and taken into account the responses to the industry consultation on the modification proposal which are included in the Final Report⁹. We have concluded that:

- implementation of the Original modification would better facilitate the achievement of the objectives of the Grid Code compared to the Grid Code baseline and WACM1¹⁰ and
- approving the Original modification is consistent with our principal objective and statutory duties.¹¹

Reasons for our decision

We consider the Original modification will better facilitate Grid Code objectives (i), (ii), (iii) & (iv) and has a neutral impact on (v). We also consider that WACM1 will better facilitate Grid Code objectives (i), (ii), (iii) and (iv) and has a neutral impact on (v).

The Proposer and the majority of respondents have, during this modification's consultation phases, commented that the modification better facilitates a number of code objectives. We note these comments and are grateful for the work that industry has done to consider this modification. We have assessed this modification against the Relevant Objectives with particular focus on (iv) as the primary driver for the modification.

(i) to permit the development, maintenance and operation of an efficient, co-ordinated and economical system for the transmission of electricity

The scope of the ENCs is to harmonise systems across the internal energy market. This should help make it easier and more efficient to operate the electricity system, by introducing a common, clear set of requirements which every new connection to the electricity network will need to meet.

(ii) 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

⁹ Grid Code proposals, final reports and representations can be viewed on NGET's website at:

<http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/Grid-code/Modifications/>

¹⁰ As set out in Standard Condition C14(1)(b) of NGET's Transmission Licence, available at:

<https://epr.ofgem.gov.uk/>

¹¹ The Authority's statutory duties are wider than matters which NGET must take into consideration and are detailed mainly in the Electricity Act 1989 as amended.

electricity on terms which neither prevent nor restrict competition in the supply or generation of electricity)

Implementation of the RfG should also help facilitate competition in the generation of electricity by improving transparency and consistency of access arrangements across different electricity systems in Europe. This removes a potential barrier to entry and allows market participants to trade between Member States more easily by ensuring that there is a level playing field in terms of connection requirements, thus improving competition in generation.

The RfG should also assist the creation of a pan-European market for power generating module (PGM) technology, by increasing the commonality of PGM requirements. This should help improve competition between manufacturers and make it cheaper to build PGM technology, thus reducing costs for consumers.

We therefore consider that both the Original modification and WACM1 better meet the objective to facilitate competition in the generation and supply of electricity.

(iii) 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

As stated above, the ENCs aim to introduce commonality and reduce complexity of arrangements across member states. This should improve the security and efficiency of the system as a whole. This should materialise through increased standardisation of equipment and specifications across the whole of the EU. In turn this should lead to improved economies of scale and increased interconnection driving improved security. We therefore consider that both modifications will promote the security and efficiency of the electricity generation, transmission and distribution systems.

(iv) 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.

We note that the Panel and the majority of respondents agree that both modifications better facilitates this relevant objective. The Proposers raised both in response to the requirement to implement RfG and HVDC. These European Regulations are legally binding and directly applicable within GB. The modifications seeks to ensure that the Grid Code is consistent with these European Regulations.

Extensive stakeholder engagement was carried out throughout the drafting of the ENCs and then through this code modification process. At the working group WACM1 was raised by SSE. WACM1 sought to remove the introduction of Type B and C generators connecting using a PON. The PON was developed by the original proposer as a practical solution to a deficiency between the RfG and the current GB arrangements. SSE considered that this did not form part of the formal requirements of the ENCs or existing processes and therefore introduced "more stringent" requirements. As a result of consultation and WACM1, the Original modification was changed to include the existing industry arrangements of EON, ION and FON. SSE alone considered that WACM1 more efficiently discharged the obligations to comply with the European Regulations.

We note the majority of the working group voted in favour of the Original modification, rather than WACM1, though a number of issues were raised. These included, amongst other issues, a lack of a recognised EU wide Equipment Certification process, an opinion that timescales for implementation is being rushed and Black Start requirements. We note the lack of an EU wide Equipment Certification process has not been resolved. However, the first of these issues is not a deficiency with the modification and

is recognised by the respondents. The timescale for implementation is written into the legislation and no scope for change is possible at this stage. The concern raised around Black Start requirements was addressed by drawing attention to the legal drafting in the final modification report.

We agree with the unanimous recommendation of the GCRP that the Original modification better facilitates the objectives, especially Grid Code objective (iv). We agree that WACM1 would also better facilitate the objectives. However, we consider that the Original Modification better meets Grid Code objective (iv) because it more efficiently discharges the legal obligations imposed by these European Regulations by providing a pragmatic solution to the current unavailability of generation equipment certificates and bridges the gap between the RfG and current GB practice.

Other issues

We also note that there is an error with the compliance dates proposed by the modification. Article 72 of RfG and Article 86 of HVDC states **that "this Regulation shall apply from three years after publication"**, however the dates proposed as part of this modification state that compliance will start three years from entry into force. We therefore encourage industry to raise a housekeeping modification to address this error to ensure that the Grid Code correctly reflects the applicable regulatory and legislative framework at all times.

Decision notice

In accordance with Standard Condition C14 of NGET's Transmission Licence, the Authority hereby directs that Grid Code Original modification proposal Grid Code GC0102: *'EU Connection Codes GB Implementation – Mod 3'* be made.

Peter Bingham
Chief Engineer

Signed on behalf of the Authority and authorised for that purpose