

National Grid Electricity Transmission PLC (NGET), Scottish Hydro Electric Transmission Ltd (SHET), Scottish Power Transmission Ltd (SPT), Offshore Transmission Operators, Distribution Network Operators, Generators, SQSS users and other interested parties

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Dear Colleagues

Modification to the SQSS¹ – Review of offshore networks (GSR011-1)

Summary

This letter sets out the Authority's decision regarding proposal GSR011-1 to modify the National Electricity Transmission System Security and Quality of Supply Standard (NETS SQSS or SQSS) version 2.2. GSR011-1 proposes minor modifications to SQSS Chapter 7 (Generation Connection Criteria Applicable to an Offshore Transmission System) and Chapter 11 (Terms and Definitions). The Authority's decision is to accept the proposed changes in GSR011-1.

Background to the modification proposal

The NETS SQSS Chapter 7 requirements for the Generation Connection Criteria Applicable to an Offshore Transmission System were initially designed following cost-benefit analysis based on generation capacities of less than 1500 MW, with radial connections to shore of less than 100 km. The parameters relevant for that analysis are cited in paragraph 7.2 of the SQSS with a statement that the generation connection criteria should only be applied up to these limits.

Subsequent reviews of the maximum infeed loss criteria relating to the whole GB system (GSR007/7a) resulted in changes to offshore criteria such that generation with a capacity up to 1800 MW can be radially connected via a single cable.

In June 2008, the Crown Estate made available Round 3 sites for the development of renewable generation. The Round 3 sites are much further from shore going out to 300 km with potential generation capacities (up to several GigaWatts (GW)). The economic connection of generation in these zones is likely to involve the use of HVDC circuits and may require the use of higher capacity cables than those currently used. The use of interconnection within a Round 3 site and between sites is also feasible.

The above developments give rise to the potential connection of offshore generators going beyond the parameters of the previous analysis as set out in paragraph 7.2. Consequently, the NETS SQSS Review Group (now the NETS SQSS Review Panel) instigated a review of the offshore criteria, to assess whether they continue to facilitate the development of an overall economic, efficient, and secure system or whether they need updating.

¹ <http://www2.nationalgrid.com/uk/industry-information/electricity-codes/sqss/the-sqss/>

The workgroup carried out new cost benefit analysis and other studies to consider if the following areas needed updating for offshore configurations:

- 1) Definitions of secured events which are currently:
 - a. Loss of a single offshore transmission circuit
 - b. Loss of a single offshore circuit with a different circuit on prior outage
 - c. Loss of a single onshore circuit with an offshore circuit on prior outage
- 2) The basis of the design of connection capacity for an offshore wind farm which is currently 100% of Transmission Entry Capacity (TEC)
- 3) The basis for capacity requirements of the Main Interconnected Transmission System (MITS) which is currently planned for offshore wind output at 70% of TEC
- 4) The treatment of short duration losses of an offshore DC link carrying more than the infrequent infeed loss (i.e. whether it can be tolerated where parallel routes can increase their flows).

As a result of the new study the workgroup concluded that areas 1), 2) and 3) do not require a change to the NETS SQSS as they continue to be valid for new configurations, higher capacities and installations further from shore. However, for 4) some further clarification was thought to be required.

The Workgroup that reviewed the NETS SQSS offshore criteria completed its report in July 2012. An industry consultation was started on GSR011 on 6 August 2012 with a closing date of 1 October 2012. No responses were received to the consultation. Following discussions between the Authority and members of the SQSS Panel, the final draft text modifications have been submitted to the Authority and published online as GSR011-1.

Objectives of the SQSS

The objectives of the SQSS² are to:

- (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;
- (ii) ensure an appropriate level of security and quality of supply and safe operation of the National Electricity Transmission System;
- (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
- (iv) facilitate electricity Transmission Licensees to comply with their obligations under EU law.

Proposed modifications to the SQSS and the Authority's assessment

The proposed modifications to the SQSS are included in Annex 1.

Removing limitation parameters

The review concluded that all the current criteria continue to be valid for the expected configurations and capacities for connecting offshore wind generation. Therefore, the qualifications currently existing in paragraph 7.2 are no longer necessary and the recommendation is to remove this paragraph.

² SQSS governance framework, pg.6: <http://www2.nationalgrid.com/uk/industry-information/electricity-codes/sqss/panel-information/>

Short Duration Losses

The current SQSS requirements for the loss of infeed from offshore generation specify that the loss is calculated at the point of connection to the onshore system (definition of Loss of Power Infeed). There is no specification of the timing of this disconnection in the definition or in any of the criteria relating to the loss of infeed. The proposed change would allow for the automatic re-distribution of power infeed through interlinks to the onshore system following the loss of an offshore connection cable. This is implicitly allowed by the current definition. However, the workgroup proposed to clarify the definition such that it refers explicitly to this redistribution. Although the workgroup specifically considered HVDC links, the principle applies to any technology or design which allows redistribution of power. Following Panel discussions, a change was made to the final text for the modification submitted to the Authority, to generalise this principle. The exact modifications to the text can be found in Annex 1 attached and are available as GSR011-1 online.³

We consider that greater clarity resulting from this change will positively impact on objective (i) of the SQSS.

Assessment against the SQSS objectives

For the reasons outlined in the previous sections, the Authority considers that the proposed changes set out in GSR011-1 would better facilitate objectives (i), (ii) and (iii) of the SQSS. Additionally we believe that this modification proposal has a neutral impact on objective (iv) of the SQSS as it is not driven by EU legislation.

Assessment against the Authority's statutory objectives and duties⁴

For the reasons outlined in the previous sections, the Authority considers that the proposed changes set out in GSR011-1 would better facilitate the Authority's principal objective and statutory duties.

Decision notice

This letter sets out the Authority's decision to approve the proposed changes to the NETS SQSS. We have concluded that -

- implementation of the modification proposal will better facilitate the achievement of the objectives of the SQSS; and
- approving the modification is consistent with our principal objective and statutory duties.

Implementation and future work

These changes will take effect three months after the Authority decision. In order for these changes to take effect, transmission licences would need to be modified such that they refer to the new version 2.4 of the NETS SQSS which will also consist of text changes reflecting the Authority's decisions on GSR008-1⁵ and GSR015.⁶ The Authority will start the licence modification process by issuing a statutory consultation in the coming weeks. Notice of the proposed modifications to the transmission licence will also go out to preferred bidders for offshore transmission licences, as these bidders are persons likely to be affected by the making of the modifications.

³ <http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/SQSS/Modifications/GSR011/>

⁴ The Authority's statutory are detailed mainly in the Electricity Act 1989 as amended.

⁵ <https://www.ofgem.gov.uk/licences-codes-and-standards/standards/security-and-quality-supply-standard-sqss>

⁶ <http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/SQSS/Modifications/GSR015/>

Any queries regarding the content of this letter should be made to Katherine Taaffe (Katherine.Taaffe@ofgem.gov.uk, 0207 901 7014) in the first instance.

A handwritten signature in blue ink, appearing to read 'Min Zhu', is positioned above the printed name and title.

Min Zhu

Associate Partner, Electricity Transmission

Signed on behalf of the Authority and authorised for that purpose

Annex 1

This annex sets out the legal text proposed by the licensees to implement this modification. The proposed new text is shown in red and is based on SQSS version 2.2 (5th March 2012).

7. Generation Connection Criteria Applicable to an Offshore Transmission System

7.1 This section presents the planning criteria applicable to the connection of one or more offshore power stations to an offshore transmission system. The criteria in this section apply from the offshore grid entry point/s (GEP) at which each offshore power station connects to an offshore transmission system, through the remainder of the offshore transmission system to the point of connection at the first onshore substation, which is the interface point (IP) in the case of a direct connection to the onshore transmission system or the user system interface point (USIP) in the case of a connection to an onshore user system.

~~7.2 The generation connection criteria, applicable to an offshore transmission system, presented in this section, are based on a series of cost benefit analyses. The scope of those analyses was bounded by certain pragmatic assumptions, which recognised the technology available at the time the analyses were carried out. Accordingly, the generation connection criteria presented in this section should only be applied up to those limits. The criteria have been updated since the initial analysis to account for developments in cable and HVDC technology. The limits are:~~

~~7.2.1 the capacity for offshore power park modules was limited to a maximum of 1500MW. Following review of the values of normal infeed loss risk and infrequent infeed loss risk, this capacity limit will equal the infrequent infeed loss risk from April 1st 2014.~~

~~7.2.2 the type of intermittent power source powering the offshore power park module was limited to wind.~~

~~7.2.3 the capacity of offshore gas turbines was limited to a maximum of 200MW per platform;~~

~~7.2.4 the distance from an offshore grid entry point on an offshore platform to the interface point or user system interface point (as the case may be) at the first onshore substation was limited to a maximum of 100km;~~

~~7.2.5 the length of any overhead line section of an offshore transmission system was limited to a maximum of 50km; and~~

~~7.2.6 Radial offshore network configurations only have been considered. Until reviewed, section 4 shall apply in respect of interconnected offshore networks.~~

~~The above limits will be subject to periodic review in the light of technological developments and experience. The limits should not be exceeded without justification provided by further review.~~

~~7.3~~ 7.2 Planning criteria are defined for all elements of an offshore transmission system including: the offshore transmission circuits and equipment on the offshore platform (whether AC or DC); the offshore transmission circuits from the offshore platform to the interface point or user system interface point (as the case may be) including undersea cables and any overhead lines (whether AC or DC); and any onshore AC voltage transformation facilities or DC converter facilities.

11. Terms and Definitions

Loss of Power Infeed: The output of a generating unit or a group of generating units or the import from external systems disconnected from the system by a secured event, less the demand disconnected from the system by the same secured event. For the avoidance of doubt if, following such a secured event, demand associated with the normal operation of the affected generating unit or generating units is automatically transferred to a supply point which is not disconnected from the system, e.g. the station board, then this shall not be deducted from the total loss of power infeed to the system. For the purpose of the operational criteria, the loss of power infeed, includes the output of a single generating unit, CCGT Module, boiler, nuclear reactor or DC Link bi-pole lost as a result of an event. In the case of an offshore generating unit or group of offshore generating units, the loss of

power infeed is measured at the interface point, or user system interface point, as appropriate.

In the case of an offshore generating unit or group of offshore generating units for which infeed will be automatically re-distributed to one or more interface points or user system interface points through one or more interlinks, the re-distribution should be taken into account in determining the total generation capacity that is disconnected.