

Modification proposal:	<b>GSR016: Small and Medium Embedded Generation Assumptions</b>		
Decision:	The Authority <sup>1</sup> approves <sup>2</sup> the proposed changes to the National Electricity Transmission System Security and Quality of Supply Standards (NETS SQSS)		
Target audience:	National Grid Electricity Transmission PLC, transmission licensees and other interested parties		
Date of publication:	24 May 2018	Implementation date:	As set out below

## Background

The NETS SQSS classifies power stations into three categories based on their capacity; Large Power Stations, Medium Power Stations, and Small Power Stations. It also classifies power stations based on their connection level into two categories; directly connected Power Stations and embedded Power Stations.

Embedded Small and Medium Power Stations are not required to be the subject of an agreement with the System Operator (SO) and are not required to participate in the Balancing Mechanism, whereas directly connected Power Stations and embedded Large Power Stations are. The active participation of a Power Station in these arrangements provides the SO with visibility of their planned power output and a means to alter this power output via the acceptance of bids and offers in the Balancing Mechanism. This visibility and flexibility is essential to allow the SO to balance and securely operate the transmission network in real time.

In recent years, the total capacity of embedded Small and Medium Power Stations has seen a rapid increase, and this trend is expected to continue. This increases the challenges faced by the SO in managing the flows across certain boundaries where the majority of generation is not visible to the SO or active in the Balancing Mechanism. Due to this, there is a risk that the SO will be less able to operate the network security in accordance with Section 5<sup>3</sup> of the NETS SQSS.

GSR016 seeks to modify the NETS SQSS to ensure that the embedded Small and Medium Power Stations are adequately represented in transmission network planning studies such that the system can be designed to provide an appropriate level of capacity.

## The modification proposal

GSR016 arose from a modification proposal raised at the July 2013 NETS SQSS Review Panel Meeting in relation to the treatment of embedded Small and Medium Power Stations under Section 4 of the NETS SQSS. The Panel recommended the formation of a Small and Medium Embedded workgroup. Another modification proposal requesting a comprehensive review of both the Security and Economy Background Assumptions under Section 4 of the NETS SQSS was raised in October 2015. The scope of the GSR016 workgroup was revised to look at how different generation backgrounds should be considered under Section 2<sup>4</sup> and Section 4<sup>5</sup> of the NETS SQSS, and how these need to be

<sup>1</sup> 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.

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

<sup>3</sup> Operation of the Onshore Transmission System.

<sup>4</sup> Generation Connection Criteria Applicable to the Onshore Transmission System

<sup>5</sup> Design of the Main Interconnected Transmission System

modified to take into account the growing proportion of embedded Small and Medium Power Stations; and that a significant percentage of the generation is no longer available to the SO to manage via the Balancing Mechanism.

The workgroup conducted a review of Section 2 and 4 of the NETS SESS. They found no discrepancy in the treatment of embedded Small and Medium Power Stations and other power stations that could arise under Section 2 of the NETS SQSS.

The workgroup found discrepancy in Section 4 of the NETS SQSS, in setting the minimum transmission capacity requirements at ACS peak demand. The ACS peak demand is defined as the peak net Transmission System demand minus the contribution from embedded Small and Medium Power Stations. Therefore, the contribution of embedded Small and Medium Power Stations would be exactly the same for both the security and the economy planned transfer conditions. This is inconsistent with the purpose of the two conditions; the security condition evaluates the NETS boundary transfer requirements assuming that intermittent generation and interconnectors are unavailable (power must come from generation plant with reliable energy supply), and the economy condition evaluates the NETS boundary transfer requirements assuming a credible dispatch with a significant output from intermittent generation and support from interconnectors. Also, the contribution of embedded Small and Medium Power Stations would generally be different to that of transmission connected Power Stations and embedded Large Power Stations of the same technology and capacity.

Further, the workgroup noted that the method of calculating the contribution from embedded Small and Medium Power Stations is not defined. Therefore there could be discrepancies between the methods applied by different Distribution Network Operators (DNOs), causing discrepancies in the data used by NGET to prepare the Future Energy Scenarios (FES). The FES provides the data to which Section 4 of the NETS SQSS is applied by Transmission Licensees when assessing boundary requirements and boundary capability as part of the Electricity Ten Year Statement, and making investment decisions as part of the Network Options Assessment process.

To address this, the workgroup recommended the following changes to the NETS SQSS:

- The definition of ACS Peak Demand such that it represents the total system demand to be met by all Power Stations (removing exclusion of embedded Small and Medium Power Stations);
- The definition of Plant Margin, Economy Planned Transfer Conditions, Planned Transfer Conditions and Security Planned Transfer Conditions such that they refer to all Power Stations (removing exclusion of embedded Small and Medium Power Stations); and,
- Sections of Appendix C (Modelling of Security Planned Transfer), Appendix D (Application of the Interconnection Allowance) and Appendix E (Modelling of Economy Planned Transfer) of the NETS SQSS to refer to all Power Stations (removing exclusion of embedded Small and Medium Power Stations).

The workgroup demonstrated the benefits of the proposed change by modelling the Electricity Ten Year Statement boundaries in the Economy and Security backgrounds under various case studies. The case studies included modelling of embedded Small and Medium Power Stations; as the NETS SQSS currently requires, using data provided by one DNO, and in accordance with this proposal. They demonstrated that the different approaches lead to different boundary required transfers, and that including embedded Small and Medium Power Stations in planning studies, as proposed by this modification, results in a more accurate reflection of the boundary required transfers. This better ensures that the transmission system is designed provide an appropriate and economic level of boundary transfer capacity.

The workgroup noted that generation data currently submitted by DNOs and the SO as part of the Standard Planning Data (Week 24 submissions) does not include embedded generation with a capacity below 1MW. The workgroup considered that the absence of this data would not lead to non-compliance as the FES datasets currently include data about gross demand, transmission connected generation, and embedded generation (including embedded generation with capacity below 1MW). However, they consider that it is necessary to ensure that the additional data is provided in order to improve the consistency of the FES and reduce any approximation errors. To address this, they recommend a Grid Code change to require that:

- the Standard Planning Data (Week 24 submissions) include embedded generation data, potentially in an aggregated format, for generation with capacity below 1MW;
- include additional demand data and embedded generation contribution data corresponding to the time of the national peak gross demand, the Grid Supply Point peak gross demand, and the national minimum gross demand; and
- require Users to provide the additional data so that the System Operator can estimate the times of the national peak gross demand and the national minimum gross demand.

As an interim solution, until the data is available, the workgroup recommended to:

- supplement the embedded generation data submitted by DNOs with best estimates from the FES for embedded generation units with capacity less than 1MW; and
- assume that the time of peak transmission demand coincides with the time of the peak gross demand.

The workgroup also considered the operability challenges that arise due to the increased capacity of generation that is not active in the Balancing Mechanism, and the risks associated with this. They discussed options to ensure the SO is able to meet the operational criteria of the NETS SQSS, however their views do not impact the modifications proposed in GSR016 and are therefore not mentioned here.

## **Industry Consultation**

An Industry Consultation was published on 5 December 2017, no responses were received. Since then, two statements of support have been submitted.

## **NGET's recommendation**

NGET recommend that the NETS SQSS is changed to include the modifications proposed in GSR016.

## **Decision notice**

This letter sets out the Authority's reasons for and the context of our 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<sup>6</sup>; and
- approving the modification is consistent with our principal objective and statutory duties<sup>7</sup>.

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<sup>6</sup> The SQSS Governance Framework <http://www2.nationalgrid.com/uk/industry-information/electricity-codes/sqss/panel-information/>

<sup>7</sup> 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.

## Reasons for our decision

We consider GSR016 better facilitates NETS SQSS objectives (i) and (ii) and has a neutral impact on the other objectives.

***(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;***

The modification proposal removes the inconsistency between the modelling of embedded Small and Medium Power Stations from that of Transmission connected Power Stations and embedded Large Power Stations in investment planning studies. This ensures that embedded Small and Medium Power Stations are represented in investment planning studies, and therefore increases the accuracy of the boundary required transfer calculated under both economic and security backgrounds. Therefore this modification proposal better ensures that the transmission system is reinforced to an appropriate, economic and efficient level.

***(ii) ensure an appropriate level of security and quality of supply and safe operation of the National Electricity Transmission System;***

The modification proposal ensures that embedded Small and Medium Power Stations are represented in investment planning studies, and therefore that the transmission system is adequately reinforced. This reduces the risk of network constraints preventing embedded Small and Medium Power Stations from contributing to demand security, and better ensures that transmission connected generation is dispatched at a realistic level in long term planning studies. It also reduces the risk that a shortage in transmission capacity could undermine the ability of all generation to meet the demand.

## Implementation

In this letter we have set out our decision to approve the changes to the SQSS proposed in GSR016. For these changes to take effect we will need to modify the relevant conditions of the electricity transmission licence so they refer to the new version of the SQSS. On 16 February 2018, we proposed such a modification to implement GSR018<sup>8</sup>. We intend to consult on a new proposal to implement GSR018 and GSR016 simultaneously.



**Peter Bingham**  
**Chief Engineer, Systems and Networks**  
Signed for and on behalf of the Authority

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<sup>8</sup> <https://www.ofgem.gov.uk/publications-and-updates/proposal-modify-electricity-transmission-licences-reflect-latest-version-national-electricity-transmission-security-and-quality-supply-standard-nets-sqss-0>