

Modification proposal:	GSR023: Clarification of the applicability of the N-1-1 Criterion¹		
Decision:	The Authority ² approves ³ 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:	02 January 2019	Implementation date:	As set out below

Background

Prior to the introduction of the British Electricity Trading and Transmission Arrangements (BETTA), the electricity system in Great Britain (GB) consisted of three companies; National Grid Electricity Transmission ("NGET") in England and Wales and SP Transmission ("SPT") and Scottish Hydro Electric Transmission ("SHET"), both in Scotland. Each company had its own security standards that were developed and maintained such that they take into account the specific needs of each transmission area.

The 'NGC SQSS' (the Transmission System Security and Quality of Supply Standard), which applied in England and Wales, required the system to be secured against two concurrent outages (a planned outage followed by a fault outage) on two independent transmission circuits at peak demand conditions, the N-1-1 criterion. Whereas the 'NSP366' (the Security of the 400kV and 275kV Systems in Scotland), which applied in Scotland, required the system to be secured against a double circuit fault at peak demand conditions, the N-D criterion. The development of interconnection between the three transmission areas was subject to the British Grid System Agreement which defined a Nominal Interconnection Capability for the interconnecting circuits. This was determined based on the N-D criterion, in accordance with the British Grid Systems Agreement 'BGSA3A.7'.

Following BETTA, the NETS SQSS was developed to apply to the onshore transmission system in GB. It was derived from its predecessors in order to ensure that the transmission system in GB continued to be developed and operated in accordance with a coordinated set of rules and to allow further harmonisation in the future in areas where there is a proven benefit.

GSR023 seeks to modify the NETS SQSS in order to clarify that the N-1-1 criterion only applies to transmission plant that is wholly within NGET's transmission area, i.e. England and Wales. GSR023 also proposes housekeeping changes to the NETS SQSS to reflect the name change of "Scottish Hydro Electric Transmission limited" (SHETL) to "Scottish Hydro Electric Transmission plc" (SHET), which occurred on 25 October 2012.

GSR023 also includes changes to the NETS SQSS Industry Governance Framework⁴, we note these changes.

¹ <https://www.nationalgrideso.com/sites/eso/files/documents/GSR023%20Final%20Report%20to%20Authority%20v1.0.pdf>

² 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.

³ This document is notice of the reasons for this decision as required by section 49A of the Electricity Act 1989.

⁴ NETS SQSS Industry Governance Framework:

<https://www.nationalgrideso.com/sites/eso/files/documents/NETS%20SQSS%20Industry%20Governance%20Framework%20v1.0%20%2830-03-12%29.pdf>

The modification proposal

Transmission boundary capabilities are calculated using power system studies at the time of the Average Cold Spell (ACS) Peak Demand⁵ with generation background set up in accordance with Section 4 of the NETS SQSS (Design of the Main Interconnected Transmission System) whilst securing against the most critical secured event defined in Section 4.

GSR023 arose during the development and commissioning of the Western HVDC Link, an interconnecting circuit between NGET's and SPT's transmission areas. The Western HVDC Link was subject to a Cost Benefit Analysis produced by a joint venture between NGET and SPT and validated by independent consultants. The capabilities reported in these studies considered a double circuit outage (N-D criterion), in line with the principles of BGSC3A.7, which were not changed at BETTA or by any subsequent modification.

It was noted that a planned outage on the Western HVDC Link followed by a single circuit fault on the 400kV system, or vice versa, would result in a restriction that exceeds that associated with a double circuit fault outage on the 400kV system. Therefore, were the capabilities of the Anglo Scottish boundary to be assessed based on an N-1-1 condition, it would look significantly lower than its value when assessed based on an N-D condition. This would be inconsistent with the intention of the NETS SQSS and would mean that the further reinforcements are required to achieve the same capability.

Clause 4.6.6 of the NETS SQSS, the N-1-1 criterion, specifies that both the fault outage and prior outage that are to be considered involve plant in NGET's transmission area. The N-1-1 criterion is not intended to cover circuits interconnecting NGET's transmission area to SPT's or SHET's transmission areas. However, the commissioning of the Western HVDC Link brought to light the need to clarify treatment of the circuits interconnecting transmission areas with differences in planning criteria. Prior to the Western HVDC Link, this was not an issue as all circuits interconnecting NGET's transmission area to SPT's or SHET's transmission areas were overhead lines and a double circuit fault (N-D criterion) had a more severe impact on the boundary capability than an N-1-1 fault (N-1-1 criterion).

The System Operator – Transmission Owner Code's (STC) Joint Planning Committee and the subgroups appointed by this committee have had a number of discussions to address this issue of providing clarity to clause 4.6.6 of the NETS SQSS. These discussions concluded that the clause should be rephrased to ensure an accurate and clear interpretation that takes into account the history and the development of the clause. GSR023 proposes to modify clause 4.6.6 of the NETS SQSS, inserting the words 'that is wholly' to the clause, such that it reads "*provided both the fault outage and prior outage involve plant that is wholly in NGET's transmission area...*" to make it clear that the N-1-1 criterion only applies to transmission plant that is wholly within NGET's transmission area.

GSR023 also proposes housekeeping changes to the NETS SQSS to reflect the name change of "Scottish Hydro Electric Transmission limited" (SHETL) to "Scottish Hydro Electric Transmission plc" (SHET), which occurred on 25 October 2012. It proposes the text "SHETL" be replaced with "SHET" in:

- paragraphs 2.10.3, 4.6.4 and D.2.2 of the NETS SQSS, and
- the definitions of Large Power Station, Medium Power Station, Onshore Transmission Licensee, SHETL, and Small Power Station in the NETS SQSS.

Industry Consultation

⁵ The NETS SQSS defines the ACS peak demand as the estimated unrestricted winter peak demand (MW and MVar) on the total system for the average cold spell condition. This represents the demand to be met by large, medium and small power stations (directly connected or embedded) and by electricity imported into the onshore transmission system from external systems across external interconnections (and which is not adjusted to take into account demand management or other techniques that could modify demand). We note that the ACS Peak demand previously excluded the demand to be met by Medium and Small emdedded power stations, however in May 2018 we approved NETS SQSS modification proposal GSR016 which amended the definition to the above.

An Industry Consultation was undertaken between 25 June 2018 and 20 July 2018. Three consultation responses were received, one from each of the three onshore transmission licensees, all of which supported the modification proposal.

NGET's recommendation

NGET recommend that the NETS SQSS is changed to include the modifications proposed in GSR023. We note that the NETS SQSS Panel members unanimously recommended that GSR023 be implemented at the NETS SQSS Panel meeting on 20 August 2018.

Decision notice

This letter sets out the Authority's decision to approve the proposed modification to the NETS SQSS and the reasons for that decision. We have concluded that:

- implementation of the modification proposal will better facilitate the achievement of objectives (i) and (ii) of the NETS SQSS;⁶ and
- approving the modification is consistent with our principal objective and statutory duties.⁷

Reasons for our decision

We consider GSR023 better facilitates NETS SQSS objectives (i) and (ii) and has a neutral impact on the other objectives. We note that GSR023's proposal to replace the text "SHETL" with "SHET" has no impact on any NETS SQSS objectives, however is required to reflect the change of name from one of the Onshore Transmission Licensees from "Scottish Hydro Electric Transmission limited" (SHETL) to "Scottish Hydro Electric Transmission plc" (SHET) on 25 October 2012.

(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 clarifies that the N-1-1 criterion of the NETS SQSS only applies to plant that is wholly within NGET's transmission area, England and Wales. If this criterion were to be misinterpreted, by applying the N-1-1 criterion to plant interconnecting NGET's transmission area to SPT's or SHET's transmission areas, it would result in cost being incurred to make unnecessary reinforcements that would be neither economic nor efficient. We note that this has not been an issue prior to the development and commissioning of the Western HVDC link. GSR032 removes the potential for this criterion to be misinterpreted. For this reason, we consider that GSR023 better meets this objective.

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

The modification proposal clarifies that plant interconnecting NGET's transmission area to SPT's or SHET's transmission areas does not need to be secured against the N-1-1 criterion. This ensures unnecessary reinforcements that would be required if such plant were to be assessed against the N-1-1 criterion are not required, thus better ensuring an appropriate level of security and quality of supply. For this reason, we consider that GSR023 better meets this objective.

Implementation

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

⁷ 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.

In this letter we have set out our decision to approve the changes to the SQSS proposed in GSR023. 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 GSR018.⁸ Due to the upcoming arrival of further SQSS modification proposals, e.g. GSR016, we decided, with the support of the SQSS Panel, to delay the implementation of GSR018 such that multiple SQSS modifications could be implemented simultaneously. We intend to shortly consult on a new licence modification proposal in order to implement GSR018⁹, GSR016¹⁰, GSR023 and GSR024¹¹ simultaneously.

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

⁸ <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>

⁹ <https://www.ofgem.gov.uk/publications-and-updates/gsr018gc0077-sub-synchronous-oscillations>

¹⁰ <https://www.ofgem.gov.uk/publications-and-updates/gsr016-small-and-medium-embedded-generation-assumptions>

¹¹ <https://www.ofgem.gov.uk/publications-and-updates/gsr023-clarification-applicability-n-1-1-criterion>