

Modification proposal:	System Operator ("SO") – Transmission Owner ("TO") Code ("STC") CA049: Amendment to Section K to provide OFTOs with the capability to respond to Reactive Power Instructions within 2 minutes		
Decision:	The Authority ¹ directs that this Modification be made ²		
Target audience:	National Grid Electricity Transmission PLC, Parties to the STC, bidders and prospective bidders to the offshore tender process and other interested parties		
Date of publication:	11 June 2013	Implementation Date:	10 business days after Authority decision

Background to the Modification proposal

National Grid Electricity Transmission ("NGET") has a requirement to maintain the reactive power³ balances on the National Electricity Transmission System ("NETS"). Reactive power can only be managed on a local basis. Therefore, without the appropriate injections of reactive power at correct locations and in appropriate timescales, the voltage profile⁴ of the NETS could breach statutory planning and operational limits⁵.

Offshore Transmission Owners ("OFTOs") are obliged to provide reactive power capability at the point where the Offshore Transmission System connects with the Onshore system, known as the Interface Point. The current requirements, set out in Section K of the STC, are equal to the requirements placed upon onshore generators which are set out in Grid Code Connection Conditions ("CC") 6.3.2, but the STC does not specify the timescales for OFTOs delivering the required reactive capability.

Grid Code Balancing Code ("BC") 2.8.4 obliges onshore generators to provide reactive power capability within 2 minutes of an instruction by the National Electricity Transmission System Operator ("NETSO"). NGET (the "proposer") considers that, as the capacity of Offshore generation increases, Onshore generation would decrease, resulting in a loss in reactive compensation provided by Onshore generation. This will need to be replaced, both in terms of quantity and timescales for delivery following instructions from the NETSO.

The proposed Modification

NGET raised CA049 (the "Modification") in July 2012. The Modification would amend the STC to require the OFTO to provide reactive power capability within 2 minutes of any instruction from the NETSO. This proposed requirement is equivalent to the requirement placed upon Onshore generators.

¹ The terms 'the Authority', 'Ofgem' and 'we' are used interchangeably in this document. Ofgem is the Office of the Gas and Electricity Markets Authority.

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

³ Reactive power is a concept to describe the background energy movement in an Alternating Current (AC) system arising from the production of electric and magnetic fields. Most equipment connected to the electricity network will generate or absorb reactive power. Source <http://www.nationalgrid.com/uk/Electricity/Balancing/services/balanceserv/reactive/>

⁴ Unlike system frequency, which is consistent across the network, voltages experienced at points across the system form a 'voltage profile', which is uniquely related to the prevailing real and reactive power supply and demand.

⁵ Source <http://www.nationalgrid.com/uk/Electricity/Balancing/services/balanceserv/reactive/>

In NGET's view, the Modification would better meet Applicable STC Objective⁶ (b), while having a neutral effect on the remaining Applicable STC Objectives.

The Modification Process

The Modification was formally submitted to the STC Modification Panel on 26 July 2012. The STC Modification Panel considered that a formal Workgroup⁷ was not necessary but that the Modification would benefit from discussion between STC parties to provide a robust solution.

Following discussion of the Modification, the view of the STC Parties was that the capability to respond to reactive power instructions is inherent in the design of Offshore networks and therefore this Modification should not increase costs. The STC parties also noted that, to expedite the process of providing reactive power to the NETSO, the OFTO could provide the NETSO with either a means of issuing the instruction by electronic data transfer or a means of changing the reactive power level directly.

A summary of the informal discussions between STC Parties appears in the Final Modification Report ("FMR")⁸, published on 3 May 2013.

Responses to the STC Modification Panel consultation

The STC Modification Panel undertook an industry consultation on the proposed Modification in November 2012. Ofgem also circulated the consultation to non-STC Parties that were involved in the offshore transmission tender process at that time. There were responses to the consultation both from STC Parties and non-STC Parties.

Three respondents supported the Modification. One respondent, while supporting the objective of the Modification, considered that the proposed change should be included in an STC Procedure, rather than within the STC. The STC Panel disagreed with this respondent, arguing that the Modification is an extension of the current requirement within Section K of the STC to ensure that the reactive equipment has the capability to effect a change in reactive output.

Those OFTOs and prospective OFTOs that responded to the consultation confirmed that they either complied, or expected to be able to comply in due course, with the requirements of the Modification. However, as this was not confirmed by all OFTOs, respondents noted that there may be a need for derogations for some STC Parties. Respondents also sought clarity on the impact of the Modification. A summary of responses and the STC Modification Panel's consideration of the key elements of those responses can be found in the FMR.

⁶ The Applicable STC Objectives are set out in Standard Licence Condition B12 (3) (a) to (f) of the Transmission Licence:

<http://epr.ofgem.gov.uk/EPRFiles/Electricity%20transmission%20full%20set%20of%20consolidated%20standards%20licence%20conditions%20-%20Current%20Version.pdf>.

⁷ Where the STC Modification Panel deems it appropriate, it may establish a Workgroup in accordance with section B7 of the STC.

⁸ A copy of the FMR can be found here: <http://www.nationalgrid.com/NR/rdonlyres/E7ADAC36-89C1-49EA-B4D0-A7E76D67163F/60457/CA049FinalModificationReportv11.pdf>

STC Parties' assessment⁹

National Grid Electricity Transmission's, Scottish Hydro-Electric Transmission's and SP Transmission Limited's assessments of the proposed Modification were that there would be no impact on their systems and no material cost impact involved in implementing the Modification.

However, the OFTO Parties noted that there may be a number of existing Offshore Transmission networks or networks in an advanced stage of construction/design that are unable to meet the requirements of the Modification. They consider that the cost and time taken to achieve compliance with the Modification should be taken into account.

Authority's concerns and how they have been addressed

In the course of the development of the Modification, we sought confirmation from the STC Modification Panel as to whether the provision of reactive power by an Offshore Transmission System that connects to an Onshore Distribution System (an embedded Offshore Transmission System) would have the same effect as reactive power from an Offshore Transmission System that connects to the Onshore Transmission System. The STC Modification Panel noted that, for the avoidance of doubt, the Modification would apply to all Offshore Transmission networks, which is a network operating at or above 132kV, regardless of point of connection. The STC Modification Panel amended the proposed STC legal text to clarify that for embedded Offshore Transmission Systems, the obligation to provide reactive power capability within 2 minutes would only apply where the NETSO is able to demonstrate that this change in reactive power has a significant effect on the Onshore Transmission System.

We noted that any change on an embedded Offshore Transmission System, would have an effect on that Onshore Distribution System and thus questioned whether the change within 2 minutes was achievable. The (then draft) FMR was updated to clarify that, prior to any instruction from the NETSO being issued, the NETSO will liaise with the relevant Distribution Network Operator ("DNO") to ensure that the change could be accommodated. The NETSO will then issue an instruction to the OFTO, who will be obliged to respond within 2 minutes.

STC Modification Panel recommendation

The STC Modification Panel considered the draft FMR on a number of occasions, including 27 February 2013, 27 March 2013, and 17 April 2013, prior to submitting the final FMR on 3 May 2013. The STC Modification Panel recommended that the Authority should approve the implementation of the Modification, with an implementation date ten business days after the Authority's decision. The STC Modification Panel agreed with NGET that the Modification would better facilitate Applicable STC Objective (b). The views of the STC Modification Panel are set out in the FMR.

The Authority's decision

We have considered the FMR, including the proposed legal text, submitted on 3 May 2013. We have considered and taken into account the responses which are included in the FMR.

⁹ A list of STC Parties can be found in Schedule A of the STC and includes onshore TOs and OFTOs.

We have concluded that implementation of the Modification, as compared with the existing provisions of the STC, would better facilitate achieving the Applicable STC Objectives and is consistent with our wider statutory duties. We therefore decide that the Modification should be implemented.

Reasons for the Authority's decision

We have assessed the Modification against the Applicable STC Objectives set out below. For the other Applicable STC Objectives, we consider that there is no impact.

Applicable STC Objective (a) 'efficient discharge of the obligations imposed upon transmission licensees by transmission licences and the Act'

OFTOs are currently expected to vary the reactive flows at the Interface Point, shortly after being instructed by the NETSO. The Modification clarifies the performance requirement for OFTOs subject to such an instruction. This should ensure that the NETSO has access to, and can use, the reactive capability of Offshore Transmission networks in the same timely manner as reactive power capability provided by Onshore generation, thus allowing the NETSO to be more certain of the outcome of any such request. This should allow both the NETSO and OFTOs to efficiently discharge the obligations to manage reactive power balances on the transmission system imposed under the transmission licence, thereby furthering objective (a).

Applicable STC Objective (b) 'development, maintenance and operation of an efficient, economical and co-ordinated system of electricity transmission'

As the capacity of Offshore Transmission increases, the NETSO will become increasingly reliant on the OFTO's reactive capability at the Offshore to Onshore interface to manage Onshore voltages. The Modification will ensure that the NETSO has access to, and can use, the reactive capability of Offshore Transmission networks in the same timely manner as reactive power capability provided by Onshore generation, thus improving the efficiency of the operation of the Transmission System.

We note that those OFTOs and prospective OFTOs that responded to the STC Modification Panel consultation confirmed that they either complied, or expected to be able to comply in due course, with the requirements of the Modification. We also note comments by other parties that some OFTOs may be unable to meet the requirements of this Modification and may seek derogation. For the avoidance of doubt, we note that any request for derogation by an OFTO would be considered on a case-by-case basis¹⁰ and nothing in this decision fetters the Authority's discretion in that respect.

We continue to question the effectiveness of requiring the OFTO to respond within 2 minutes in circumstances where the Offshore network is embedded in a distribution network. However, we note the changes made to the original Modification, such that for embedded Offshore Transmission Systems it is up to NGET to reasonably demonstrate that the magnitude of the available change in reactive power has a significant effect on the Onshore Transmission System.

¹⁰ Any applicants are referred to our guidance on derogations:
<http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=14&refer=Networks/Techn/TechStandds/Derogtns>.

We consider that this change largely addresses the concerns we identified, and is also likely to limit the need for existing OFTOs to seek derogation. On balance, we consider that the Modification better facilitates this Applicable Objective.

Decision notice

In accordance with Standard Condition B12 of the Electricity Transmission Licence, the Authority directs the system operator to make the proposed Modification STC CA049 "Amendment of section K to provide OFTOs with the capability to respond to reactive power instructions within 2 minutes" on behalf of the STC parties.

Min Zhu

Associate Director, Offshore Transmission

Signed on behalf of the Authority and authorised for that purpose