

STC Section K in Operational Timescales

1. Introduction

The purpose of this short paper is to seek the STC Panel's guidance on the requirements for compliance with STC Section K in operational timescales and the process to record and manage non-compliances in operational timescales.

STC section K, describes the technical design, operational criteria and performance requirements for offshore transmission systems. Section K mirrors certain sections of the Grid Code Connection Conditions.

Offshore transmission systems generally incorporate static compensation equipment to achieve compliance with the voltage control and reactive power requirements of section K, this can be provided by converters in the wind-turbines, static var compensators (SVCs) at the interface point, or a combination of the two.

By comparison, conventional synchronous generators have inherent reactive power capability which is an intrinsic feature of the type of electrical machine used.

Where SVCs are used to meet the requirements, this is achieved by one or more SVC units, generally comprising an SVC electronic valve to provide rapid dynamic response / fine control; and fixed static capacitor and reactor elements. In general no redundancy is incorporated into the provision of SVCs, due to cost (£20m+ for a 250MW connection), significant impact on onshore land take and lack of any mandatory contractual requirement to do so. Historically, reliability of static compensation equipment has not been particularly good on the UK transmission system. It is understood that National Grid uses a general figure of 85% availability for static compensation when carrying out planning studies to take account of unavailability due to faults and planned outages of associated transmission circuits. It is expected that static compensation equipment associated with offshore transmission networks will have a much higher availability than 85%, but probably not as high as the associated primary export path (cables and transformers). It is therefore highly likely that an SVC will become unavailable during periods when there is capability for full export from an offshore windfarm.

NETSO benefits from the SVCs being connected to the transmission system on a continuous basis, unlike other generation types, where the capability is lost when it desynchronises. Whilst capability could be reduced to align with the requirements corresponding to the associated generation level, in practice it is not feasible or sensible to do so. Therefore, such SVCs provide benefit to all transmission users and potentially avoid investment by the onshore TO.

Transmission Capital has been in discussion with NETSO, as to the applicable mechanism to deal with an operational timescale deficiency in either reactive power or voltage control capability due to the loss of an SVC (or components of). Whilst these discussions have been specific to the particular project, they are likely to apply to any offshore transmission network incorporating SVCs. These discussions have highlighted that there is a lack of clarity within the STC on this subject.

Where both parties are in agreement, it is that generation should not be constrained provided that certain minimum technical standards can be met and there is no significant impact on

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the operation of the Main Interconnected Transmission System (MITS).

2. Discussion

a. Is Section K a design and operational requirement?

STC section K, is titled as the technical design, operational criteria and performance requirements for offshore transmission systems. STC Section D 2.2.6 requires that:

Without limitation to Section C, Part One, paragraph 2.2, in **planning and developing** its Transmission System, each Transmission Owner shall ensure that its Transmission System complies with:

2.2.6.1 the minimum technical, design and operational criteria and performance requirements set out or referred to in Connection Conditions 6.1, 6.2, 6.3 and 6.4 and in Planning Code 6.2 and/or 6.3 as applicable; or

2.2.6.2 such other technical criteria or requirements as apply to any relevant part of its Transmission System by virtue of a current Transmission Derogation; and in the case of an Offshore Transmission System, each Transmission Owner shall also ensure that:

2.2.6.3 its Transmission System meets the minimum technical, design and operational criteria and performance requirements set out or referred to in Section K of this Code;

STC Section C 2.2 states:

Each Transmission Owner agrees with NGET to provide Transmission Services and to plan, develop, operate and maintain its Transmission System in accordance with its Transmission Licence and this Code, subject to any Transmission Derogations from time to time. In the case of Construction Projects that involved OTSDUW, it is acknowledged that a User may have undertaken some or all of the original planning and/or development of the Transmission System.

There is no specific reference to Section K in STC Section C.

It is clear that compliance with Section K is required for design (and proved by compliance testing) but in operational timescale the obligation is no different to the obligation that any TO has to make available Transmission Services to the NETSO. Full and continued compliance with Section K, is not a pre-requisite to the ongoing capability to connect and remain connected. An onshore TO, whose SVC is faulty is not immediately in breach of the STC or its licence. What is less clear is what process should be used to handle such a deficiency.

3. How is a deficiency in section K handled?

This section considers the appropriate formal process for managing and recording any deficiency in the ability to meet the requirements of Section K in Operational timescales.

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- i. OCLR Process. STCP 4-4 describes the process for the provision of asset operational information and is applicable to all TOs. During an outage a Transmission Service is deemed to be wholly withdrawn. However where there is a Services Reduction (for example where there is a reduction in technical capability), the OCLR (Operational Capability Limit Record) process is used. This is a formal record of the Services Reduction is made between the TO and NETSO. The ongoing management of the OCL is described in section 3.7 of STCP4-4. This is the process currently used by TOs to manage non-conformances in the way in which Transmission Services are provided to the NETSO. The process fits with the STC framework, including the Services Capability Statement (SCS) which is linked to the OFTO Licences. This process either as is, or in a modified form could be used to record and manage non-conformances with Section K.
- ii. If the OCLR process as it stands is not appropriate then it would imply that a derogation or a new process is required. Currently there is no such process, so derogations would be required by each project. Given the timescales required to obtain such a derogation, it would not be feasible to grant a derogation when an operational timescale reduction occurs. This implies that each project would need to apply for a derogation to come into force at Licence Grant, allow a relief from complying with certain aspects of section K, under conditions where the SVC is out of service. The downside of this approach is the broad brush relief this provides and the very limited oversight of the TO's attempts to restore compliance. It also appears to be sticking plaster solution to a deficiency in the code.
- iii. A new process could be developed which is similar to Grid Code CP8. Whilst this is possible, it would be necessary to determine how this works in conjunction with the SCTP 4-4 process and STC, or whether STCP 4-4 is modified to incorporate the new process. For example, would the process is just applicable to section K only? Given the tighter regulatory oversight on TOs and licence obligations to comply with the STC (compared to only contractual requirements to comply with GC by generators) it may be deemed that an enhanced process is not required.

From an initial assessment, it would seem that the STCP4-4 process or an enhanced version of it would be the most appropriate and easiest achieved method of managing this issue.

4. Views of the STC Modification Panel

The views of the STC Modification Panel are requested to confirm that the above understanding is correct.

The STC Modification Panel is also requested to provide guidance on the most appropriate method of managing Operational phase non-conformances with certain requirements of section K.

It is appreciated that such decisions require careful consideration. The STC Modification Panel is requested to indicate the way in which this should be dealt with, for example by the formal modification process, or by some other means.