SQSS Review Panel – Modification Proposal

Treatment of Sub Synchronous Oscillations in the SQSS

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Summary

A number of Transmission Licencees and Transmission Users are in the process of enhancing their networks or connecting generation using Series Capacitor and HVDC technologies. Both of these types of equipment can cause Sub-Synchronous Oscillations to occur by interacting with other User's equipment in the form of Sub Synchronous Resonance or Sub Synchronous Torsional Interaction.

The Grid Code Review Panel paper "Suppression of Sub Synchronous Resonance from Series Compensators" (pp13/54) proposed changes to the Grid Code to place obligations on Transmission Licencees to mitigate Sub Synchronous Resonance where Series Compensation is deployed. The Grid Code Review Panel asked that these proposals be given further consideration in light of concerns raised by Transmission Licencees about how and where any SSR related obligations are expressed within the transmission frameworks. The Grid Code Review Panel also asked whether there was a need to capture Sub Synchronous Resonance and Sub Synchronous Torsional Interaction within the SQSS.

Parties Impacted

Medium

Owners of Synchronous Generators

Transmission Licencees

Description & Background

A brief technical description of Sub Synchronous Resonance and Sub Synchronous Torsional Interaction is provided in the GCRP Paper pp13/54. Further background is a also provided in GC040 – Information Required to Evaluate Sub-Synchronous Resonance[1].

The main issue raised in pp13/54 was that Transmission Users had no visibility of the criteria that would be applied by Transmission Licencees in designing and building Series Capacitor based network enhancements, and no explicit assurance that any SSR related risks were mitigated. Whilst User's were confident that Licensees were taking appropriate measures in line with their Licence obligations, members of the Grid Code Review Panel argued that further clarity and transparency of the criteria applied would be beneficial to all parties. Network Licensees urged that care should be taken in developing any such obligations as there was a risk that these inadvertently imposed uneconomic solutions. Network Licensees also highlighted that whilst the Grid Code set out performance criteria at Connection Sites aspects of the SO-TO Code (STC) may be relevant and it is the NETS SQSS which sets out the criteria applied by Transmission Owners in the design of their systems.

[1] See GC0040 at http://www.nationalgrid.com/uk/Electricity/Codes/gridcode/consultationpapers/

Proposed Solution
Due to the complexity of the technical and regulatory issues raised in this paper, it is recommended that a small expert group is convened to consider the need to incorporate Sub Synchronous Resonance and Sub Synchronous Torsional Interaction considerations in the SQSS and develop high level proposals for the SQSS Panel to consider. The proposals will include the relevant Terms of Reference if it is deemed necessary to convene a workgroup.

Assessment against SQSS 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; *Clarification of SSR and SSTI related design and operating criteria may promote consistency and efficiency of network design.* ***(ii) ensure an appropriate level of security and quality of supply and safe operation of the National Electricity Transmission System;*** N/A ***(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 *Inclusion of SSR and SSTI related design and operating criteria in the SQSS will offer additional assurance and transparency to User's* ***(iv) facilitate electricity Transmission Licensees to comply with their obligations under EU law.*** N/A

Impact & Assessment
Impact on the SQSS Various ***Impact on the National Electricity Transmission System (NETS)*** Transparency of the design and operational criteria applied to manage SSR and SSTI risks ***Impact on Greenhouse Gas Emissions*** N/A ***Impact on relevant computer systems*** N/A

Impact on core industry documents
SQSS developments may interact with related proposals for the Grid Code

Impact on other industry documents
N/A

Supporting Documentation
Have you attached any supporting documentation: GCRP Paper pp13/54

Recommendation
The SQSS Review Panel is invited to: Seek members to form an expert group to consider the issues raised in this paper and to report the Panel with a proposed way forward.

Document Guidance

This document is used to raise a Modification Proposal at the SQSS Review Panel. Incomplete forms will not be processed and the Proposer may be asked to clarify any information that is not clear.

Guidance has been provided in square brackets within the document but please contact the SQSS Review Panel Secretary James Cooper (james.cooper3@nationalgrid.com) if you have any queries.