

Grid Code Review Panel
SSR Roles and Responsibilities for DC Converters

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Summary

The Grid Code requires DC Converter owners, and OTSDUW parties where relevant, to ensure that their DC Converter “will not cause a sub-synchronous resonance problem”. Industry discussions recently reviewed under GC0077² and GSR018³ highlighted there are various views on how the requirement as stated in CC.6.3.16 should be applied over the lifetime of the equipment. There is a need to reach an agreed view and if necessary change the Grid Code to clarify roles and responsibilities.

This paper recommends that the Panel agrees next steps when it has an opportunity to review conclusions from GC0077 and GSR018.

Users Impacted

High

DC Converter owners, Generators in respect of DC Convertors, Developers of new Generators

Medium

Low

Network Operators

Description & Background

DC Convertors have the potential to interact adversely with Generators connected close to them. The risk of damage or degradation to a Generator can be minimised by appropriate control system design on the DC Converter.

CC.6.3.16 (a) places obligations on DC Converter owners and other relevant parties to ensure that their equipment “will not cause a sub-synchronous resonance problem”.

“CC.6.3.16 a) **DC Converter** owners, or Generators in respect of **OTSDUW DC Convertors** or **Network Operators** in the case of an **Embedded DC Converter Station** not subject to a **Bilateral Agreement** must ensure that any of their **Onshore DC Converters** or **OTSDUW DC Converters** will not cause a sub-synchronous resonance problem on the **Total System**. Each **DC Converter** or **OTSDUW DC Converter** is required to be provided with sub-synchronous damping control facilities.”

Industry discussion highlighted that the requirement was being interpreted in at least two different ways:

- 1) That the DC Converter owner should ensure that sub-synchronous resonance had been dealt with at the time of its connection; or

¹ The Code Administrator will provide the paper reference following submission to National Grid.

² <http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/Grid-code/Modifications/GC0077/>

³ <http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/SQSS/Modifications/GSR018/>

- 2) The DC Converter owner has an enduring obligation to ensure that sub-synchronous resonance does not occur in any circumstance.

Under interpretation 1), it may not be clear to all parties how subsequent changes to network conditions and new connections are considered with respect to the DC Converter's sub-synchronous performance.

Under interpretation 2), the DC Converter owner would be expected to re-assess sub-synchronous resonance risks for each change in network conditions which would seem to be inconsistent with the approach currently applied across the Transmission commercial frameworks and set out in the Connection and Use of System Code (CUSC) Section 6 for Connections, Modifications and Third Party Works.

Proposed Solution

The Grid Code Review Panel and NETS SQSS Panel have agreed a programme of work to address the management of sub-synchronous oscillations under GC0077 and GSR018. It is recommended that Panel consider how or whether to review CC.6.3.16 when GC0077 is next presented at the Panel.

Assessment against Grid Code Objectives

- (i) **to permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity;**

Clarification of requirements will ensure that the roles and responsibilities for the management of ongoing sub-synchronous resonance risks associated with DC Converters are well understood and can be managed efficiently.

- (ii) **to facilitate competition in the generation and supply of electricity (and without limiting the foregoing, to facilitate the national electricity transmission system being made available to persons authorised to supply or generate electricity on terms which neither prevent nor restrict competition in the supply or generation of electricity);**

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- (iii) **subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution systems in the national electricity transmission system operator area taken as a whole; and**

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- (iv) **to efficiently discharge the obligations imposed upon the licensee by this license and to comply with the Electricity Regulation and any relevant legally binding decisions of the European Commission and/or the Agency.**

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Impact & Assessment

Impact on the National Electricity Transmission System (NETS)

None

Impact on Greenhouse Gas Emissions

None

Impact on core industry documents

None

Impact on other industry documents

None

| Supporting Documentation |
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| Have you attached any supporting documentation NO If Yes, please provide the title of the attachment: |

| Recommendation |
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| The Grid Code Review Panel is invited to: Note the issue for information only at this stage |

Document Guidance

This proforma is used to raise an issue at the Grid Code Review Panel, as well as providing an initial assessment. An issue can be anything that a party would like to raise and does not have to result in a modification to the Grid Code or creation of a Working Group.

Guidance has been provided in square brackets within the document but please contact National Grid, The Code Administrator, with any questions or queries about the proforma at grid.code@nationalgrid.com.