

Grid Code Review Panel – Issue Assessment Proforma
Fault Ride Through

Date Raised: 18 January 2012

GCRP Ref: pp12/04¹

A Panel Paper by John Morris
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Summary

Fault ride through requirements are set out in Grid Code Connection Condition CC.6.3.15.

Users Impacted

High - Generating Units, Power Park Modules, DC Converters and OTSDUW Plant and Apparatus

Medium - None Identified

Low - None Identified

Description & Background

Grid Code Connection Conditions CC.6.3.15 specifies the fault ride through capability of Generating Units, Power Park Modules, DC Converters and OTSDUW Plant and Apparatus.

For short circuit faults at Supergrid Voltage on the Onshore Transmission System up to 140ms in duration, the fault ride through requirement is defined in CC.6.3.15.1 (a) (i). The BCA specifies the duration of zero voltage and fault clearance times based on the technical particulars at the local connection point.

For balanced Supergrid Voltage dips on the Onshore Transmission System having durations greater than 140ms and up to 3 minutes the fault ride through requirement is defined in CC6.3.15.1 (b) (i). This is by reference to a generic voltage–duration profile for which plant should remain transiently stable and connected to the System without tripping.

For synchronous generating plant compliance with CC6.3.15.1(b) (i) is by self-certification through the production of simulation studies that are included in the User Data File Structure. Should these studies reveal that the synchronous generating unit cannot meet all potential voltage-duration profiles defined by Figure 5 envelope then NGET will treat this as non-compliance.

This Issue Identification Assessment proposes that both the User and NGET can agree at this stage to review the voltage-duration profile at the point of connection of the synchronous generating unit to see if this allows compliance to be achieved. This is analogous to compliance with CC6.3.15(a)(i) for short circuit faults of less than 140ms where the BCA specifies the duration of zero voltage and fault clearance times based on the technical particulars at the local connection point.

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

It should be noted that the ENTSO-E draft network code requirements for generators currently includes a modified voltage-duration profile with a minimum and maximum boundaries. The current example voltage dips in CCA.4A.3 for 30% and 50% would not lie within the boundaries defined by Figure 7 in the ENTSO-E draft code for synchronous generators connected at greater than 100kV voltage level. The timetable for adoption of the ENTSO-E requirements may still be protracted and it is suggested that this proposal be considered on its own merits. It would be possible to use the proposed boundaries as the limiting case for any site specific voltage-duration profile if this was deemed necessary by comitology. See attached comparison of ENTSO-E RfG and the current GB Grid Code requirements.

Proposed Solution/Next Steps

It is proposed to insert an additional clause in CC.6.3.15.15(b) to allow the option to meet a connection point specific voltage-duration profile where the generic profile cannot be met.

CC.6.3.15.1 (b)(iii) Where the generic envelope defined in Figure 5 cannot be fully met for all combinations of voltage-duration profile then the User may request a location specific profile which may be used as an alternative to the generic profile for compliance purposes.

A similar clause could be included in CC.6.3.15.2 (b) to provide the same option on a non-discriminatory basis for Offshore Generating Units, Offshore Power Park Modules to withstand voltage dips on the LV Side of the Offshore Platform greater than 140ms in duration.

Impact & Assessment

Impact on the National Electricity Transmission System (NETS)

The proposer has not identified any impacts that the proposed modification will have on the National Electricity Transmission System as power quality will be maintained to current standards.

Impact on Greenhouse Gas Emissions

The proposer has not identified any impacts that the proposed modification will have on Greenhouse Gas emissions.

Impact on core industry documents

The proposed modification does not impact on any core industry documents

Impact on other industry documents

The proposed modification does not impact on any other industry documents

Assessment against Grid Code Objectives

Will the proposed changes to the Grid Code better facilitate any of the Grid Code Objectives:

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

This proposal will better facilitate objectives (i) and (ii) by providing an option to use a specific voltage-duration profile at the point of connection for synchronous generating plant where the generic profile of CC6.3.15(b)(i) cannot fully met. This results in a more efficient outcome early on in the generation procurement process, removing uncertainty for the generator with no impact on objective (iii) security of supply.

Supporting Documentation

Have you attached any supporting documentation

YES

If Yes, please provide the title of the attachment:

RfG v GBGC requirements

Recommendation

The Grid Code Review Panel is invited to **approve this issue for progression to an Industry Consultation**

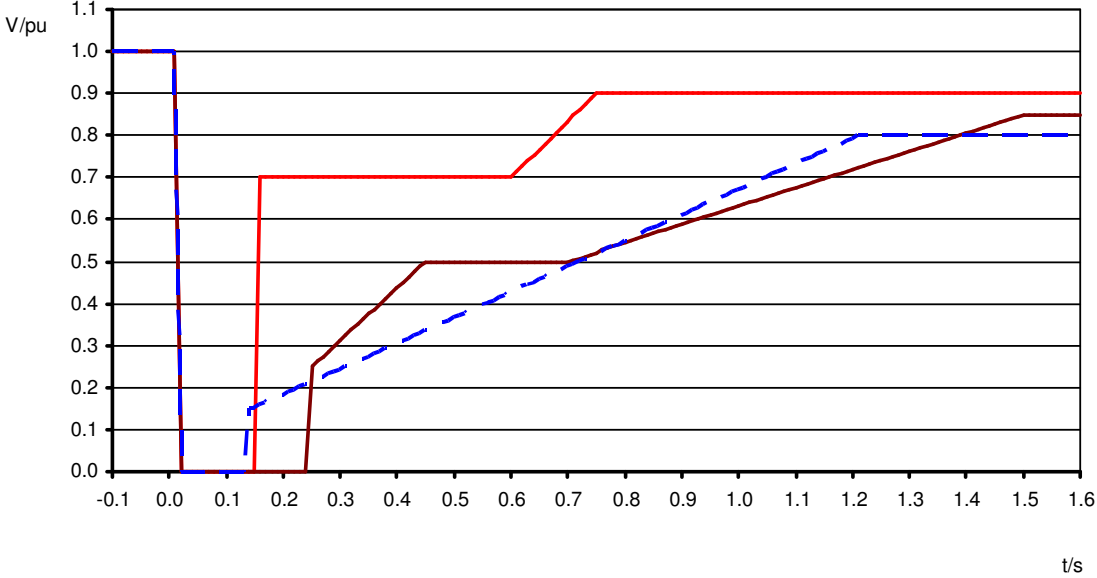
GCRP Decision (to be completed by the Committee Secretary following the GCRP)

The Grid Code Review Panel determined that this issue should:

INSERT GCRP DECISION

RfG v GBGC Requirements

Fault Ride Through - Transmission Connected Synchronous Generator



Legend: RfG min (red solid line), RfG max (brown solid line), GBGC (blue dashed line).
GBGC defines period of zero volts in BCA up to max 140ms