

GC0062 Fault Ride Through Workgroup TERMS OF REFERENCE

Background

1. Following the publication of Paper Reference PP12/04 in January 2012, a set of Workshops were held in September and November 2012 and January 2013 to discuss the issues of fault ride through. The key conclusions drawn from these Workshops were:-
 - i) The major issue raised in Paper PP12/04 was associated with the fault ride through performance of large Synchronous Generators. Having considered a number of options, the workshops concluded that further consideration should be given to early adoption of the ENTSO-E Network Code Requirements for Generators (RfG) Fault Ride Through Requirements, specifically targeted at Large Synchronous Generators.
 - ii) Workshop participants acknowledged that whilst there were still issues associated with Asynchronous Generation, the fault ride through issues as presented in PP12/04 were largely associated with Synchronous Plant and wind farm developers and manufacturers were not keen to undergo a full set of additional research and type tests when they were broadly happy with the current GB Grid Code fault ride through requirements.
 - iii) A formal Grid Code Fault Ride Through Working Group should be established to examine the implications of early adoption of the ENTSO-E RfG for Synchronous Generation, including the specification of GB Parameters.
 - iv) The scope of the work will initially consider the fault ride through issues associated with Large Directly Connected Synchronous Generators (as defined in the Grid Code), and then consider the application to Embedded Generation. For the purposes of this working group, only Synchronous Generation within the current GB Framework definitions¹ shall be considered (ie Large and Medium Power Stations). To ensure consistency with the ENTSO-E RfG, most of the requirements will directly map to Type D Generators although when Embedded Synchronous Generators in SHETL's Transmission Area are considered the requirements will be need to be consistent with Type C Generators.

A full summary of the presentations and notes of the three Workshops including the background to fault ride through, the issues and possible solutions are available on National Grid's website from the following link:-

¹ The GB Grid Code requirements are classified on the basis of Large (100MW and above in England and Wales, 30MW and above in SPT's Area and 10MW and above in SHETL's Area). Medium Power Stations exist only in England and Wales of between 50 – 100MW. In Europe the ENTSO-E RfG classifies Generation into Type A (400W – 1MW and connected below 110kV), Type B (1MW – 10MW and connected below 110kV), Type C (10MW – 30MW and connected below 110kV) and Type D (above 30MW and connected above 110kV).

2. A summary of these workshops, and the intention to establish a formal Grid Code Working Group was presented to the January 2013 GCRP.
3. In addition to the discussions held during the Fault Ride Through Workshops, there have also been two additional ENTSO-E RfG developments which are considered to fit well with this work. These are summarised as follows:-
 - (a) As part of ongoing work to consider options for applying the EU network codes to the GB regulatory framework, National Grid together with DNO representatives and Ofgem have been considering options for integrating the ENTSO-E RfG and GB Grid Code. As part of this process, Fault Ride Through has been selected as an example of how the ENTSO-E RfG and GB Codes can be integrated. The results of this work will be presented to JESG Members in the Spring of 2013 for their consideration and feedback
 - (b) As a separate element of work, ENTSO-E is also aiming to develop a pilot to explore specific examples of how the National Choices within RfG will be established under the different regulatory arrangements of EU Member States. National Grid is fully supportive of this work and sees Fault Ride Through as an excellent example to submit as part of this pilot, not least because of the synergy with this GCRP Working Group.

In summary, the ENTSO-E RfG is expected to enter the Comitology phase later this year with approval in 2014. There will then be a 2 - 3 year implementation period in which the National Codes will be updated to ensure consistency with the European Code. As one recommendation of the Fault Ride Through Workshops was to consider early adoption of the ENTSO-E RfG for Synchronous Plant these additional European developments fit well with this stream of work.

Governance

4. The Workgroup shall formally report to the GCRP in March 2015.

Membership

5. The Workgroup shall comprise a suitable and appropriate cross-section of experience and expertise from across the industry, which shall include:

Name	Role	Representing
TBA	Chair	National Grid
Paul Wakeley	Technical Secretary	National Grid
Graham Stein	National Grid Representative	National Grid
Antony Johnson	National Grid Representative	National Grid
	Industry Representative	EDF
	Industry Representative	EoN
	Industry Representative	RWE
	Industry Representative	Consultants
	Industry Representative	Transmission Owners
	Authority Representative	Ofgem
	Observer	

6. As the initial work will concentrate on Large Directly connected Synchronous Generators, and then subsequently consider Embedded Synchronous

Generation, it is recommended that in order to minimise delays, the work group initially comprises of members whose interests are associated with directly connected plant and then once this element of work is completed, the membership is expanded to include stakeholders with an interest in Large and Medium Embedded Synchronous Plant.

Meeting Administration

7. The frequency of Workgroup meetings shall be defined as necessary by the Workgroup chair to meet the scope and objectives of the work being undertaken at that time.
8. National Grid will provide technical secretary resource to the Workgroup and handle administrative arrangements such as venue, agenda and minutes.
9. The Workgroup will have a dedicated section on the National Grid website to enable information such as minutes, papers and presentations to be available to a wider audience.

Scope

10. The Workgroup shall consider and report on the following:
 - (a) Using information currently available, understand the implications and interpretation of the Fault Ride Through requirements as defined in the ENTSO-E Requirements for Generators
 - (b) Develop GB specific requirements and parameters specifically for directly connected and Embedded Synchronous Generation. It is the intention of this working group that it will provide clarity to Generators and ensure consistency with the ENTSO-E RfG Code. The output of this work will feed into the ENTSO-E RfG pilot programme which is specifically aimed at implementing the ENTSO-E RfG and National Code in addition to selection of National parameters.
 - (c) The scope of the work will only cover Directly Connected and Embedded Large and Medium Power Stations using the existing terms within the GB Grid Code. There is no intention to introduce terms of the RfG into this drafting unless there is a specific reason to do so.

(d) Asses the impact to all Stakeholders of early adoption of the ENTSO-E RfG fault ride through requirements and the implications to existing Generators. In addition, the Workgroup will inform GCRP and JESG Members of the progress of the work in particular the options for integration of the ENTSO-E RfG with the National Code and the developments of the ENTSO-E pilot programme.
11. In the context of this risk, the Workgroup will:
 - (a) Review the parameters (including the voltage against time curves) that National Grid will need to define in developing the fault ride through requirements for Synchronous Generators which are consistent with those defined in the ENTSO-E RfG.
 - (b) Ensure the proposals adopted:-

- i) Address the issues raised in paper PP12/04
 - ii) Are in the best interests of all Stakeholders
 - iii) Are consistent with the ENTSO-E RfG and do not cause any conflicts when the ENTSO-E European Network Codes are all fully implemented in 2016.
 - iv) Provide clarity to all affected User's
- (c) Determine an appropriate implementation timescale for any new requirements.

12. The Workgroup will also:

- (a) Take account of other industry developments
- (b) Take account of relevant international practice and the guidance provided as part of the European (ENTSO-E) Code development, in particular the ENTSO-E RfG pilot programme and options for integrating the ENTSO-E RfG and GB Code together with the National parameters.

Deliverables

13. The Workgroup will provide updates and a Workgroup Report to the Grid Code Review Panel which will:
- Detail the findings of the Workgroup, to the GCRP and JESG;
 - Draft, prioritise and recommend changes to the Grid Code and associated documents in order to implement the findings of the Workgroup; and
 - Highlight any consequential changes which are or may be required,

Timescales

14. It is anticipated that this Workgroup will provide an update to each GCRP meeting and present a Workgroup Report to the March 2014 GCRP meeting.
15. If for any reason the Workgroup is in existence for more than one year, there is a responsibility for the Workgroup to produce a yearly update report, including but not limited to; current progress, reasons for any delays, next steps and likely conclusion dates.