Date:- 12 September 2012

FAULT RIDE THROUGH WORKSHOP

NOTES OF MEETING HELD AT NATIONAL GRID HOUSE – WARWICK ON MONDAY 10 SEPTEMBER 2012

1) Present

Peter Thomas (PT) – Consultant acting on behalf of Nordex
John Morris (JM) – EDF Energy
Herve Meljac (HM)– EDF Energy
Paul Newton (PN) – EoN
Alan Mason (AM) – Repower Systems UK (by Telephone)
Mustafa Kayikci (MK) – TNEI
Graham Stein (GS) – National Grid
Ben Marshall (BM) – National Grid
Jo Zhou (JZ) – National Grid
Balasingham (B) – National Grid
Antony Johnson (AJ) – National Grid

2) Introductions

GS introduced the workshop and welcomed everyone to the meeting.

3) Overview of Workshop

GS set the background to the workshop which he advised had been arranged to discuss the fault ride through issues summarised in John Morris's Grid Code Review Panel Paper reference PP12_04.

He summarised the objectives of the workshop which were briefly to cover the background to fault ride through, why fault ride through is seen as an issue from both a manufacturer and Transmission System design / operational perspective followed up with a discussion session.

He advised that all the slides presented at the workshop would be made available to all attendees.

ACTION:- National Grid to circulate all of the slides presented at the workshop to meeting attendees.

4) Background to Fault Ride Through

AJ provided an overview of the background to fault ride through and why it was required from a transmission system perspective. He advised that the requirements had been introduced into the Grid Code in June 2005 following consultation H/04 (Requirements for New Generation Technologies and DC Converters) and applied equally to Synchronous Generation, Asynchronous Generation and DC Converter Technologies on the basis of non discrimination.

AJ illustrated the requirements for fault ride through in his presentation and also advised that the justification and need case including the shape of the voltage duration curve was documented in Consultation H/04. He also summarised the requirements for longer duration faults (ie voltage dips longer than 140ms) through the examples of Appendix 4 of the Connection Conditions.

He advised that for the purposes of this workshop the discussion would focus on the fault ride through requirements for Large Directly Connected Generators.

5) European Developments

AJ provided an overview of the European Grid Code developments and the impact of the ENTSO-E Requirements for Generators. AJ illustrated this process through a presentation, but in summary advised that a full set of European Commercial Codes were under currently development. These would sit above the existing GB Codes and there would, in the future, be a need to ensure full consistency between the GB Codes and European Codes.

AJ advised that the current European Codes are still under development with the requirements for Generators Code (RfG) being fast tracked. He advised that that the RfG had been subject to a full industry consultation in March of this year with a fully revised version being available in June 2012. The document is currently with DECC and Ofgem prior to being submitted to the European Commission for the Comitology Stage.

AJ highlighted in his presentation that the RfG document included fault ride through requirements which are subtly different those in the GB Grid Code. Under the RfG, a voltage duration profile has been defined together with a range of parameters. The TSO will define the exact profile required within the parameter ranges defined by the RfG document. The parameter range under the ENTSO-E RfG document is however quite large and the minimum requirements of the RfG are considered to be significantly less onerous than the current GB requirement. AJ also noted in his presentation that under the RfG document the requirements for Power Park Modules are different to Synchronous Generators

AJ also noted that question 24 of the FAQ document (https://www.entsoe.eu/resources/network-codes/requirements-for-generators/) provided some guidance on the interpretation of the ENTSO-E RfG Fault Ride Through requirements. In response MK and PN believed that the interpretation of the Fault Ride Through Requirements under the RfG Code was different to that in GB, and sought assurance that the TSO's in Europe would be implementing the requirements in the same way as GB. AJ did advise that the RfG could change yet again during the comitology phase and therefore this could be quite a difficult issue to resolve in the near term. However he did advise that he would attempt to obtain some clarity on this issue.

ACTION:- AJ to determine clarity on interpretation of the RfG Fault Ride Through requirements.

6) Fault Ride Through Issues – A Generators Perspective

JM provided a presentation on the fault ride through requirements from a Generators perspective, in particular with regard to Large Directly Connected Synchronous Generators. He summarised the Grid Code issues that must be satisfied in proving compliance in addition to recently introduced Compliance provisions of the Grid Code. In his presentation JM noted that:-

i) The study requirements only appeared to apply to Non Synchronous Generating Units, DC Converters and Power Park Modules.
ii) The zero voltage specified in the Bilateral Agreement always defaults to 140ms rather than a site specific value.
iii) The ENTSO-E RfG Code states generators must ride through faults for a minimum of 140ms where as the GB Code specifies Generators must ride through faults to a value specified in the Bilateral Agreement which shall be no more than 140ms.

In response to item i) above Bala, advised that in general there was no requirement for Synchronous generators to provide simulation studies for proving fault ride through and active power recovery, so long as the plant satisfied the technical specification given in the Bilateral Connection Agreement and Grid Code.

With regard to item ii) AJ advised that the default duration was set at 140ms which is based on the typical protection operating time of a three ended circuit. It was acknowledged that the Grid Code states that the protection operating time will be specified in the Bilateral Agreement but it was advised that 140ms was generally being used as the default requirement. AJ advised that whilst the local protection operating time could be quoted, as there are a number of permutations and combinations the default requirement was 140ms from a transmission perspective, however where an operating time of 140ms was seen as excessively demanding there would be no reason why the User could not contact National Grid during the design phase to request the actual protection operating times.

It was noted that the ENTSO-E RfG Code does not specify an option for fault durations less than 140ms and this issue was considered to be more onerous than the GB Code.

JM also provided examples of the RTE Voltage Duration curve and compared this with the GB Curve. It was suggested that the developer could request a location specific FRT voltage duration curve or the developer could submit a FRT curve which National Grid could assess.

National Grid advised that such a process would result in quite a high administrative burden and would be a difficult area to demonstrate equitable treatment over – ie one generator would have different requirements to another. In view of this, early adoption of the ENTSO Requirements for Generators in this area may provide an alternative solution.

7) Managing Fault Ride Through Compliance – D Balasingham

Bala provided a presentation on Compliance. He outlined the fault ride through requirements, with examples, for both Type A (less than 140ms) and Type B (greater than 140ms) faults. He then compared the GB Fault Ride Through requirements with the ENTSO-E RfG which showed that the minimum Fault Ride Through requirements in Europe are less onerous than those in GB. This resulted in the re-iterated view that early adoption of the ENTSO-E requirements for Generators (especially with different requirements between the requirements for Power Park Modules and Synchronous Generators) may provide a suitable way forward.

8) Specific Connection Applications – Examples – B Marshall / J Zhou

BM provided a presentation on the system requirements for fault ride through with references back to the Security and Quality of Supply Standards. He provided examples of the effect of a fault on the transmission system and the elements which contribute towards voltage recovery following a fault.

9) Discussion

Following the presentations the points below were raised.

i) What are the implications of not amending the GB Fault Ride Through requirements.
ii) The actual fault clearance time is not specified in the Bilateral Agreement but reverts to the default of 140ms.
iii) System Studies have shown Synchronous Plant has difficulties in satisfying the current Grid Code requirements
iv) It was noted that there was no common standard between the pre and post fault conditions
v) Active Power Recovery is influenced by the size and type of Generator.
vi) Voltage recovery is influenced by the Generator and strength of the network at the Connection Point.
vii) Consider early adoption of the ENTSO-E RfG Fault Ride Through Requirements.

ACTION – All - Consider the implications of the above discussion points.

10) Next Steps

It was suggested that above actions be considered by all attendees and a further meeting scheduled for 4 weeks time.

ACTION – National Grid to Schedule a meeting for October time to discuss the ENTSO-E RfG and issues raised above in more detail.

Summary of Actions

No	Action	Status
1	National Grid to circulate all of the slides presented at the workshop to meeting attendees.	Completed and published on National Grid Website
2	AJ to determine clarity on interpretation of the RfG Fault Ride Through requirements.	Ongoing
3	All – Consider the points raised in section 9 i) – vii).	Ongoing
4	National Grid to Schedule a meeting for October time to discuss the ENTSO-E RfG and issues raised in Action 3 in more detail.	Ongoing