

**Meeting:** 1

**Date:** 11/02/16

**Location:** National Grid House, Warwick

**Overview**

The purpose of this meeting was to address the GB implementation of the fault ride through requirements detailed in RfG, including setting of parameters for GB within the allowed ranges.

**Background to Fault Ride Through**

FRT capability was first introduced to the Grid Code in 2005 to prevent generation tripping following a voltage dip when connected to a healthy circuit. This applied to both synchronous and asynchronous generation for transmission system faults at >200kV.

Under the Grid Code fault ride through defines:

- CC.6.3.15.1(a) - The requirements for Generating Plant to remain connected and stable for balanced and unbalanced faults up to 140ms in duration (Mode A).
- CC.6.3.15.1(b) -The requirements for Generating Plant to remain connected and stable for balanced voltage dips in excess of 140ms (Mode B).

**Scope of GC0062**

The GC0062 workgroup was established to address the issue of synchronous generating units struggling to meet the requirements for longer duration voltage dips (ie dips in excess of 140ms). The amendment proposed for GC0062 relaxes the FRT capability requirements on synchronous generation for Mode B voltage dips.

The GC0062 workgroup agreed that, since RfG FRT capability only covers secured faults (ie <140ms duration) and refers to the voltage at the point of connection, it would not be addressed by GC0062. Appendix 2 of the workgroup report does however contain a proposed Voltage against time curve for a directly connected Synchronous Power Generating Module (ie Type D connected at 400/275kV).

The GC0062 workgroup report is currently out for industry consultation until 9 March.

**RfG Fault Ride Through Requirements**

**Summary**

1. Under RfG, requirements are defined differently to those in the Grid Code at present in terms of a Voltage against Time Curve at the Connection Point.
2. The requirements vary depending upon the type of plant (synchronous/non-synchronous).

3. The requirements for Type D are different to those for Types B and C (both synchronous/non-synchronous)
4. The RfG requirements apply only for secured faults on the transmission system (ie in GB Mode A faults of up to 140ms in duration).
5. RfG also contains compliance provisions. Part of the GC0062 Workgroup Report (Appendix 2) provides examples of how compliance can be demonstrated.

Please refer to slides as presented by AJ for details of requirements for Type A-D generation.

**Tasks and Timescales**

1. Ensure correct industry representation
2. Review suggested voltage against time curve for Large (Type D Transmission Connected Plant) synchronous power generating modules.
3. Apply equivalent requirement for Type B and C SPGMs
4. Develop requirements for Power Park Modules (Type D Transmission Connected) – noting choices are quite limited
5. Apply equivalent for Type B and C PPMs.
6. Consider fast fault current injection requirements for PPMs.
7. Carry out legal drafting (including parameter setting)

It is proposed that these tasks will need to be substantially completed in two further meetings. The legal drafting will be subject to consultation and may though be submitted in a format such that it can be slotted in to the final amended Grid Code structure.

**Actions**

**Review definition of transmission system and what a secured fault in GB means.**

See attached – in conclusion though, FRT applies in GB for faults of >200kV equipment which by definition is always on the transmission system.



Transmission System Definition

**Consider where the requirements for small generators transmission connected at <132kV will be covered.**

Options could be to cover directly in the Grid Code or to use this to refer such generators to the D-code avoiding duplication.

**AJ/RW – produce initial mapping of generators to structure. Begin drafting legal text for C/D generators using GC as starting point.**

**Parameter setting:**

The parameters to set are those in tables 3.1, 3.2, 7.1 and 7.2.

**AJ/RW - Initial view to produce and discuss in next meeting.**

**Detail:**

Table 7.1 type A-C & 7.2 type D PGMs

Covered by slides 50 - 51 in meeting pack (as came out of GC0062)

How each of these figures has been captured is covered in the report.

**BM - check what the SOF says and bring back to the group. Any views need to be evidence based.**

PJ – note that the curve depends on the fault level at a site. Check needs to include this as the post-fault fault level is important.

**YA - run studies based on Scottish actual figures.**

Table 3.1 type A-C SPGMs

Slide 34

Need to do some studies on this.

**BM - there are a couple of examples in SOF. Need to understand what machines will do in these situations though.**

**MK - huge range of connection voltages, machine sizes and fault levels. Could take a weighted average of fault levels from DNO LTDS information.**

**CW, FM, All - Need some more information from alternator manufacturers. Action on all.**

Table 3.2 type D SPGMs

Slide 59

**All - any comments on this?**

Slide 35

Windfarms can do 15% at terminals. And can't go any higher than this. Need some more study results and/or info from manufacturers.

**All - Need some more information from alternator manufacturers. Action on all.**

Drafting of legal text - use the GC as a starting point. We will do this for C-D.

**Next Meeting**

GC0049-T Wednesday 9 March, Warwick

(Note this is day 1 of the 2 day connection codes meeting slot)

**Attendees:**

GM	Greg Middleton	Deep Sea Electronics Plc
TM	Tim Moore	UKPN
PJ	Phil Jenner	HNP
AF	Alastair Frew	Scottishpower
CW	Chris Whitworth	AMPS
MK	Mike Kay	ENA
DG	David Griffiths	RWE Innogy
YA	Yash Audichya	SSE
AK	Anne Kensall	NGET
FM	Frank Martin	Siemens
PW	Peter Woodcock	RWE Generation UK
AD	Amir Dahresobh	Nordex
MB	Mick Barlow	S&C Electric Company
CM	Campbell McDonald	SSE Generation
SS	Sridhar Sahukari	Dong Energy
AJ	Antony Johnson	National Grid
HH	Honor Hynes	National Grid
RW	Rob Wilson	National Grid
BM	Ben Marshall	National Grid

**Useful Links**

GC0048 (see 'Workgroups tab'):

<http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/Grid-code/Modifications/GC0048/>

JESG: <http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/European-network-code/Joint-European-Stakeholder-Group/>