Minutes

Meeting name : GC0087: Frequency Response Provisions

Meeting number: 5

Date of meeting : Tuesday 23 February 2016

Time : 10:00 – 14:00

Location : Warwick Hilton
Stratford Rd, Warwick, CV34 6RE

Attendees

Graham Stein	GS	National Grid (Chair)
Fiona Williams	FW	National Grid
Franklin Rodrick	FR	National Grid (Technical Secretary)
Rui Rui	RR	Scottish Power
Peter Woodcock	PW	RWE
Phil Jenner	PJ	Horizon
Chris Marsland	CM	Energ
Antony Johnson	AJ	National Grid
Andrejs Svalovs	AS	GE
Damian Jackman	DJ	SSE
Eamonn Bell	EB	Renewable UK
Ian Nuttall	IN	National Grid
David Griffiths	DG	RWE
Paul Graham	PG	UK Power Reserve
Niall Duncan	ND	Senvion
Joe Duddy	JD	RES

Apologies

Andy Vaudin	AV	EDF Energy
Amir Dahresobh	AD	Nordex

Introduction

1. GS welcomed everyone to the meeting. GS explained that the purpose of the meeting was to discuss and agree whether a GC modification or policy change is required for implementation of workstream 6 GC0048 Requirement for Generators which covers the frequency response issues.

Minutes of last meeting

2. FW discussed the draft minutes from the previous meeting on 18 December. The comments were agreed and will be revised and published. The Terms of Reference will be updated and discussed at the Grid Code Review Panel meeting in March 2016.
3. **Action 21 – FW to update the terms of reference and circulate for GCRP approval**

Review of actions

1. **Action 6 –** FW provided inertia duration curves but more clarity is required as to why the graphs are as they are – eg was there a flip in coal/gas prices, compare with the demand curves, impact of renewable generation, diff between 2011/12 etc. (completed)
2. **Action 7 -** FW to liaise with voltage and reactive group when it is formed
3. **Action 15 –** FW to issue minutes from last meeting and RW to ensure the ToR area uploaded to the website (completed see action 21)
4. **Action 16 –** IN to provide GC clause which explains why LFSM-O kicks in at 50.4Hz when range is 49.5 – 50.5 Hz (completed)
5. **Action 17 –** FW/RW to carefully word our interpretation/understanding of the concurrent/cumulative obligations of LFSM-U and FSM and then seek clarification of our understanding from ENTSOE. This should include visual tools to enable understanding at ENTSOE.
6. **Action 18 –** FW to define what fast/slow response would look like and how it would be instructed. (completed)
7. **Action 19 –** IN to define insensitivity and deadband. (completed)
8. **Action 20 –** FW to produce a note describing FSM choices/options. (completed)

Updated Terms of Reference – Inclusion of RoCoF Withstand

9. GS explained the work that had been undertaken in GC0079 to the group. GS added that the RoCoF withstand issue should be taken out of GC0079 and combined with the scope of GC0087. The terms of reference will now include RoCoF withstand and GCRP has already agreed this approach.

10. JD provided a summary of RoCoF withstand issues with large generators in Ireland. Eirgrid Grid Code contained a 0.5Hx/s withstand reqyuirement which is being increased to 1Hz/s and extended to NI. Generators have each been given a deadline (based on their significance determined by load factor) to complete the studies to show they can manage compliance for higher withstand. There are no RoCoF withstand parameters defined in the GB Grid Code.

11. GS highlighted that the GC0079 workgroup report will be available by March/April 2016. The withstand requirement for new generators and compliance issues for existing generators were included in phase 2 of the workgroup.

12. GC0079 has not enough generator manufacturer representation to effectively consider their views on RoCoF withstand, hence it was suggested to move RoCoF withstand to GC0087. GC0087 will still need smaller generator manufacturers (sub 5MW) to attend the meeting.

13. GS requested that the group (in particular the manufacturers) collect information about their experience of RoCoF withstand under onerous conditions with a view to sharing it at the next meeting.

14. **Action 22 –** All manufacturers to provide what data/evidence they may have on the most onerous fault they have been able to withstand.

RfG Frequency Parameter Discussion

Limited Frequency Sensitivity Mode – Overfrequency (LFSM-O)

15. JD suggested removing RfG article 13.2(b) from the scope of GC0087 as it relates to Type A generators which are connected to the distribution network. It was agreed that the D-code needs to be amended and that the DCRP workgroup should be responsible for this, therefore we need to liaise with GC0048 to ensure that the DCRP are aware of this.

16. There are a few remaining superfluous details in the definition of LFSM_O which NG will consider, otherwise LFSM_O is complete for GC0087.

17. PJ noted that in implementing RfG the working group should be mindful of the requirements being removed as well as those being added. Clauses in the existing grid code should be retained that can be beneficial in giving flexibility, for example the non-automatic action outlined in BC3.7.2.b.v.
18.

19. **Action 23 –** Liaise with DCRP and GC0048 re LFSM_O requirements for type A generators.

20. **Action 24 –** FW to review details of LFSM_O and confirm the issue is closed.

21. **Maintenance of Constant Active Power**

22. It was agreed that the Grid Code already complies with RfG in this matter.

23. **Power Output with Falling Frequency**

24. It was agreed that the Grid Code already lies within the defined envelope.

25. **Limited Frequency Sensitivity Mode – Underfrequency (LFSM-U)**

26. FW explained that the introduction of LFSM-U to RfG can be described as a "best endeavours" clause should there be a major event. Any part loaded plant will be expected to do as much as they can during a low frequency excursion. The columns headed "Time to reach % output required" and "Providing period (mins)" were deemed unnecessary or not applicable.

27. JD questioned whether NGET have done any studies to show the benefits of LFSM-U to the System Operator including improved performance or reduced volume/cost of frequency response procurement. It was agreed that NG would carry out studies to evaluate the effect of LFSM_U set to react at 49.5Hz with a delay of 2s and a droop of 10%. It was also agreed that NG would evaluate option (c) in the table which is for a 5s delay and 10% droop.

28. **Action 25 –** NG to evaluate the effect of option (a) and option (c) from the LFSM_U table activating at 49.5Hz.

29. **Frequency Sensitive Mode (FSM)**

30. FW explained that the FSM proposed parameters are very similar to GB parameters. It was also suggested that NG look at 1s delay from non-synchronous generators.

31. **Action 26 –** NG to evaluate the benefit of 1s delay (including improved performance or reduced volume/cost of frequency response procurement) from non-synchronous plant in FSM mode.

32. PJ suggested that a droop setting of 10% could be selected. The current wording for droop is ambiguous and the requirement may be interpreted as having the ability to be set a 3-5% droop rather than what setting itself should be. The new text should clarify this ambiguity, and a maximum 10% droop would allow developers to set appropriate droops whilst still achieving the primary and secondary response levels.

33. JD commented that in his opinion the proposed rapid frequency response should not be mandated in GB codes as it can lead to market issues (excess of supply suppressing market prices) and inefficient investment by the generators. He noted that NG's recent call for expression of interest to provide "enhanced frequency response" resulted in >6GW of potential providers making DNO connection applications without any need to mandate this service. He also added that NGET will have to justify the requirement of rapid frequency response before mandating it in GB.

34. IN had drafted some rewording of the Grid Code to more clearly define insensitivity and deadband with reference to frequency. This was generally accepted with some minor amendments. IN was asked to draft some new code to cover frequency deadband from RfG.

35. **Action 27 –** IN to draft code for insensitivity and deadband for the implementation of RfG.

36. There was discussion around the timetabling of RfG implementation and how to keep GC0087 in line with those timescales.

37. **Action 28 –** FR to confirm RfG timetabling with Celine Reddin.

38. **Ancillary Services Business Monitoring (ASBMON)**

39. RfG Article 15.2(g)(i) refers to real-time operational monitoring and some of the values specified such as droop and deadband are pre-set. There may need to be some clarification of these requirements with ENTSOE.

40. RfG Article 15.2(g)(ii) also states provision of additional signals which can be interpreted as ASBMON. ASBMON is currently defined in the Relevant Electrical Standards TS3.24.95_RES.

41. **Action 29 –** AJ to look into alignment of current GC requirements for monitoring with RfG.

42. **AOB**

43. **Action 30 –** GS to circulate the GC0079 RoCoF withstand survey to the workgroup.

Actions

44. **Action 7 -** FW to liaise with voltage and reactive group when it is formed
45. **Action 17 –** FW/RW to carefully word our interpretation/understanding of the concurrent/cumulative obligations of LFSM-U and FSM and then seek clarification of our understanding from ENTSOE.
46. **Action 21 – FW to update the terms of reference and circulate for GCRP approval**
47. **Action 22 –** Alll manufacturers to provide what data they may have on the most onerous fault they have been able to withstand.
48. **Action 23 –** Liaise with DCRP and GC0087 re LFSM_O requirements for type A generators.
49. **Action 24 –** FW to review details of LFSM_O and confirm the issue is closed.
50. **Action 25 –** NG to evaluate the effect of option (a) and option (c) from the LFSM_U table activating at 49.5Hz.
51. **Action 26 –** NG to evaluate the benefit of 1s delay from non-synchronous plant in FSM mode.
52. **Action 27 –** IN to draft code for insensitivity and deadband for the implementation of RfG.
53. **Action 28 –** FR to confirm RfG timetabling with Celine Reddin.
54. **Action 29 –** AJ to look into alignment of current Ancillary Services Monitoring requirements with RfG.
55. **Action 30 –** GS to circulate the GC0079 RoCoF withstand survey to the workgroup.

Date and Time of Next Meeting

56. **FR to send out a Doodle poll to select date for next meeting (mid-April)**