

Agenda

Meeting name : GC0075: Hybrid STATCOMS
Meeting number: 5
Date of meeting : Monday 27th April 2015
Time : 10:00 – 14:00
Location : Holiday Inn, Olympus Avenue
 Leamington Spa
 CV34 6RJ

Item	Topic		Documents
1	Introductions & Apologies	AJ	
2	Minutes of last Meeting	AJ	Minutes
3	Hybrid STATCOM/SVC Presentation		
	Actions Recap of objectives Applications and Generation Types Covered Types of Events / Data Questionnaire Response Draft Grid Code Legal text Working Group Report Grid Code process	AJ / RI	Presentation
4	Discussion	All	
5	Next Steps	All	
6	AOB	All	

Attendees

Name	Initials	Company
Antony Johnson	AJ	National Grid, Chair
Richard Ierna	RI	National Grid
Franklin Rodrick	FR	National Grid, Technical Secretary
Charles Cresswell (by telephone)	CC	Senvion UK
Shafiu Ahmed	SA	Siemens
Alireza Mousavi	AM	ABB
John Diaz de Leon (by telephone)	JDL	American Superconductor Europe
Razvan Pabat-Stroe	RPS	Scottish Power
Mick Barlow	MB	S&C Electric
Sridhar Sahukari	SS	DONG Energy

Apologies

Name	Initials	Company
Graham Stein	GS	National Grid
Mick Chowns	MC	RWE
Mike Lee	ML	Transmission Investment
Peter Jones	PJ	ABB
Peter Thomas	PT	Nordex
Narend Reddy	NR	American Superconductor Europe
Clifton Ellis	CE	S&C Electric
Ian Cunningham	IC	Alstom Grid
Dave Walker	DW	Alstom Grid
Rui Rui	RR	Iberdrola
Philippe Maibach	PM	ABB
Simon Vogelsanger	SV	ABB
Isaac Gutierrez	IG	Scottish Power
Laurent Poutrain	LP	VIZIMAX Inc.
Sigrd Bolik	SB	Senvion UK
Damian Jackman	DJ	SSE Generation
Lee Holdsworth	LH	RES
Fahd Hashiesh	FH	ABB

Introductions & Apologies

1. AJ welcomed everyone to the meeting and the attendants introduced themselves. AJ explained that the purpose of the meeting was to comment on the workgroup report before it can be submitted to the July GCRP.

Minutes of last meeting

2. Minutes and actions from the previous meeting were discussed. SS highlighted item 6 which states reactive current but instead it should be active current.
3. No further comments were provided and the minutes from the previous meeting were accepted as final.

Manufacturer Survey

4. AJ explained the manufacturer survey and highlighted that 6 manufacturers replied to the survey. RI asked the group if they wanted to highlight any potential issues.
5. There were no major issues highlighted apart from a few spelling errors.

Workgroup Report

All text below refers to V1.00 of the report. NB a newer version filename “GC0075 Workgroup Report V1.05b.pdf” was released still at V1.00 internally, the only difference being the diagram some of which had become hidden following conversion to PDF format.

1. SS said at the last meeting there was a discussion on the on load step change and questioned whether it should be included. AJ said that it will be addressed and clarified. RI explained that SA had also raised a point about 25 events. SS questioned how the issue was getting addressed. MB said that there should be no ambiguity and text should be simple.
2. SA highlighted that the issue SS raised has been addressed in 16.5 of the workgroup report. MB said that it should be highlighted in the legal text.
3. SA questioned item 2 on page 10 – Cost benefit analysis.. AJ highlighted that the ToR doesn't ask for a CBA and questioned if the group required one as it may delay the process. MB said that it may come out in the consultation that the CBA is required. LH added that from the developer point of view the CBA will be required. AJ and RI noted this point and agreed that a CBA should be included within the report.
4. RI questioned the group on what CBA should cover. RI questioned if the group was happy with the solution that was proposed by the workgroup report. The group was in agreement that it was the best option. RI said the CBA could include:- network options (fast auto reclose), optimal location of compensation plant, full convertor options, RfG implications, losses and efficiencies.
5. CC noted that the manufacturer survey did not highlight any additional cost. MB said that these costs would be site specific, as the requirements may have to be altered.
6. MB asked whether there should be a point included about Fast Auto reclose in the report.
7. SS highlighted that the dates of the Workgroup meetings did not matchup.
8. SA raised a question on figure 6.2 on the graphs – both sides of the graph show reactive lead but this should be corrected such that the right hand side should be lead and the left hand side should be lag.
9. SA raised a question with regard to section 6.12 – enquiring if some of the solutions present in the market don't require discharge resistors.. RI said some manufacturers can provide 1

second switching but this would limit the type of switchgear for the developers. He also referred to the presentation given by Vizimax at the November 2014 meeting explaining that in this presentation Vizimax demonstrated a solution which didn't require fast discharge.

10. SS raised a question on section 6.14 – if the capacitor is switched at voltage 0, then it doesn't require discharging but for any other voltage switching, discharge would be required. RI said if you switch at peak then the rate of change of volts is low and the tolerance on timing is therefore less critical. The key to switching is closing the switch when the voltage across the switch is zero and not necessarily when the voltage across the capacitor is zero.
11. SS highlighted section 7 - DAR operations and questioned whether there should be any information on continuous voltage control, if there is any statistical data and how often it is required.
12. MB / SA highlighted 7.21 – questioning the significance of the diagram. RI gave an explanation of the diagram. MB questioned the timescales on Q response and whether it is from the generator side. RI answered the question through figure 7.1. MB questioned whether the Q response will be required every 15 seconds and RI answered that it's required to be capable of 15 second responses.
13. MB said there is a conflict regarding FRT and Steady State performance in the report. SA added that clarification needs to be sought on the definition of "a sufficiently large step"
14. SA and RI had a discussion on figure 7.2. RI said that he would reword section 7, redraw figure 7.2 and recirculate the report. MB said that it should be kept generic so it does not tie down the developers. RI said he would add a point about power flow.
15. SA raised a question on 7.27 – voltage depression gradient and asked if the text can be worded accordingly. AJ explained the purpose of the diagram and its meaning. SA said there is a formatting issue with the diagram.
16. SS raised a question on 7.39 – are conventional generators able to produce reactive current at 0.p.u. volts. RI gave an explanation of the operation of conventional generation.
17. SS raised a question on 7.40 – should it say that the Grid Code shows the requirement. AJ said that Grid Code doesn't mandate this.
18. SA raised a question on simulation in 8.1 – Were the wind farms connected, correctly modelled as it is unclear the reasons behind the settings? RI gave an explanation of the simulation and said the minimum Grid Code requirement was used as the basis for the study.
19. SA raised a question on Point 8.9 – why was the assumption made about inoperability. RI said the assumption is made based on scenario's in 2018.
20. MB raised a question on 10.16 – he said that there should be a reason on what the situation was before and what it would be, instead of having the data there should be a comparison.
21. SS raised a question on article 18.3 (paragraph 11.3 of workgroup report) –. AJ said we believe the proposed Grid Code text is consistent with the RfG.
22. MB raised a question on 11.13 – The number of event's are limited at 25 and these can happen in a short period of time.
23. MB raised a question about 11.14 and whether the section for RfG 11.5 addresses the question of repeatability. AJ highlighted that pre RfG, repeatability was identified as issue and that although RfG doesn't address it then it will be addressed in the National Codes.
24. MB raised a point on 13.4 - that it may not be necessary to lock out the system and simply needs time to cool down.
25. MB raised a question about 13.11 - What exactly will be required for compliance testing and will it be down to individual interpretation. RI said the wording was suggested by the NG

compliance team. RI added that the compliance team will probably not test compliance unless they suspect a problem with a Generator. MB said that there should be defined compliance measures.

26. Point 15.2 – the implementation date of April 2017 will be discussed internally at NG and the general consensus was that the requirement would not apply to plant with a Completion Date before December 2017.

27. SA questioned 16.1 – whether reactive capability includes both the MCS and MSR.

John Diaz de Leon Presentation

28. The Group had a discussion on repeatability and it was noted that the wording in the report is ambiguous.

29. JDL highlighted that the text needs to be clear and state any form of tests that would be required.

Next Steps

It was agreed that the Workgroup report should be updated in line with the comments discussed during the meeting.

Actions:

1. RI to add a CBA section to the report.
2. RI to ensure the work group meeting dates in the report are correct.
3. RI to correct figure 6.2.
4. RI to reword section 7 adding a point about power flow, redraw figure 7.2 and recirculate.
5. RI to add a diagram for the south coast study showing the volts staying up with full availability of Reactive Power.
6. AJ to check report consistency with RfG.
7. RI/AJ to look at the frequency of 25 events.
8. AJ/RI to look at what compliance testing will be required.
9. RI to find out whether section 16.1 of the report refers to MSC, MSR or both.
10. Action: AJ / RI to look at creating an appendix with examples of repeatability.