

Minutes

Meeting name	Frequency changes during large system disturbances workgroup, phase 2 (GC0079)
Meeting number	34
Date	22 nd September 2015
Time	10.30 – 12.30
Location	Teleconference

Future meeting dates

Meeting Number	Date
35	Thurs 22 nd October 2015
36	Mon 23 rd November 2015
37	Mon 21 st December 2015
38	Mon 25 th January 2016
39	Wed 24 th February 2016
40	Wed 23 rd March 2016

1) Introduction & apologies

MK welcomed all attendees to the teleconference, apologising for the last minute change of arrangements in cancelling the face-to-face meeting scheduled at the ENA.

2) Review of previous minutes from meeting

MK requested any workgroup additions or alterations to the minutes. The minutes were approved at the time, but updates were requested outside the meeting which were subsequently considered. These were approved at meeting 35, and will be uploaded to the GC0079 section of the NG website. **[ACTION]** RJW to arrange upload of meeting 33 minutes

3) Terms of Reference (ToRs) Update

GS gave a summary of the GCRP discussion of the GC0079 ToR. Whilst they were broadly agreed, GS explained that there was some debate on whether it would be more efficient to separate the work on withstand (a requirement under RfG) into a separate workgroup with potentially revised membership. CM believed the current approach is inefficient, and that co-ordination back to the RfG implementation workgroup (GC0048) was essential before this could be agreed. MK and RJW suggested this would be discussed at the next GC0048 workgroup (25/09/2015).

MK confirmed that the ToR had been brought to the recent DCRP (pre-GCRP) and were accepted.

[ACTION] MK/GS/RJW to confirm with GC0048 whether the RfG withstand work would be incorporated into GC0079 or managed separately

4) Phase 2 update – University of Stathclyde Report

AD presented slides containing a selection of the data tables used in the final report, focusing on the expected occurrence of out of phase re-closure faults that the RoCoF setting options present. Data on the high risk contributors to these faults was also displayed under two option scenarios.

The numbers of potential islanding incidents was discussed. It was noted that as in Phase 1, the risks to personnel from an out of phase reclosure had not been formally assessed. In discussion it was agreed that it would be very hard to come up with a methodology to establish this risk. MK asked the WG to consider how the number of islanding incidents could be used in establishing WG recommendations.

In response to questions and discussion, AD directed the workgroup look at section 4.2 which lists the key assumptions of the work. MK encouraged the workgroup to consider any gaps as part of the next stage of work, e.g. danger to human life, and consider who else should be consulted with on this.

GS queried with AD whether gensets were assumed to be in Power Factor mode or Voltage Control mode at the point of a fault. AD confirmed that this affects the outcome by two orders of magnitude (ie an island is two orders of magnitude more likely to persist if the genset is in voltage control mode). There was a discussion on the expectation for behaviours of different genset technologies, particularly gas and diesel, which GM thought were unlikely to have Voltage Control. MK reminded the group that the European Network Codes, namely RfG, introduce more voltage control than has been common in GB historically. GS believed that the impact of changing settings on existing generators with limited Voltage Control would potentially be different to future generators which had been asked to have it. GM reiterated his belief that most grid-connected diesel generators would be operating in Power Factor mode. PN urged caution on this assumption, and stated that for transient events, such as voltage steps, a fast-acting AVR would be expected to respond in some way, prior to the action of the power factor controller. MK raised the point on time (how fast acting is 'fast acting') – GM said that there were many variables in play. PN suggested some response from the power factor controller may be observed within 3 seconds, but the AVR response, to voltage steps for example, would be considerably faster, even in the case of a rotating excitation system.

[ACTION] MK asked the workgroup to review the report and provide any comments back to AD within ten days. He encouraged the group to focus on the key points, and if necessary discuss aspects via email circulation. He would seek the WG's sign off the report at the next meeting.

[ACTION] AD confirmed he would try and summarise the comments and release a new version with comments addressed in time for the 22/10 WG meeting.

5) GC0079 plan of work for remainder of 2015

GS outlined the activities the workgroup needed to focus on for the remainder of the year. The opportunity to discuss and scope work on system operating limits and withstand was noted. GS suggested including a recurring agenda item to check progress against this plan **[ACTION]** RJW to update agenda.

6) AOB

IK sought further clarification on his circulated query regarding a generator seeking a derogation from applying the Phase 1 RoCoF settings due to a health and safety risk. The workgroup noted that all generators >5MW had to be compliant with the Phase 1 setting requirements and that a number of mitigations exist where a generator believes that there is an unacceptable personnel or other risk with changing to a higher setting, and these include intertripping or synchrocheck on relevant DNO's breakers.

On the associated process for the risk assessment, JA suggested that there could be a requirement for a standard risk assessment template to be provided, and/or a guidance document, which MB agreed with. MK reminded the WG that the guidance in the appendix to G59/3 was as far as the WG wanted to go, bearing in mind that this was a new activity and (a) the WG did not have relevant experience and (b) wouldn't want to stifle innovation in how to undertake the assessment. Nevertheless MK was interested to know whether DNOs had received similar requests or submissions so feedback from these could be used for a standard template. **[ACTION DNO Reps]**

GM provided some feedback that AMPS were concerned as to what the upper limit was for instantaneous RoCoF[†] during the 0.5s definite time required by the G59/3 settings. ML pointed out that the traces from 28//09/12 event showed some large apparent RoCoF in the first couple of cycles. PN told the group that Ireland specified frequency profiles and this may be useful*. MK thought that these issues would be addressed as part of the work to set a RoCoF ride through for new generation, as required by the RfG. In the meantime MK offered GM offline discussions with GS, ML and MK to see if the issue could be advanced in a way to assist AMPS. **[ACTION]** MK invited GM to discuss with him, GS and ML.

There was a query on why the quarterly Phase 1 compliance data was circulated showing only generation from 2010. GS thought that pre and post 2010 data was actually presented but GS and MK would check this. **[ACTION]** GS to check

MB queried what other DNOs had done to contact customers about Phase 1. MK stated that NPG had done workshops and JA said that some others did visits, with the rest relying on letters and phone calls.

CM mentioned the National Grid meeting which clashed with the call, re. Frequency Response from electric vehicles and other battery storage devices. RJW confirmed he has spoken to the NGET team involved and lined them up to present if a future meeting is held in Warwick. **[ACTION]** RJW

**JD provided further clarification by circulation:*

(EirGrid / SONI paper "Ireland RoCoF Generator Studies Project – Study Cases For Electrical Dynamic Simulations", 23/12/2014).

Irish generators were keen for the TSOs to provide a set of cases for which, if ride through could be demonstrated, then grid code compliance would be taken as read. Eirgrid rejected this concept.

Eirgrid has provided a collection of frequency profiles for historic incidents but is careful to state that this is not and cannot be a comprehensive list of cases. Generators are required to comply with the grid code. Ride through these cases alone is insufficient.

†Post meeting comment from JD: What is "instantaneous RoCoF"? How should it be defined and measured? How would one distinguish Instantaneous RoCoF from instantaneous phase shift?

7) Future meetings (dates & locations)

RJW reiterated MK's apology on the late change of arrangements. Also for the differing approach to previously Technical Secretary SB. RJW was attempting to go for consistency with other Grid Code modifications, and confirmed that meeting attendance would be requested via email and calendar invites would not be issued as this caused confusion if accepted a long way in advance. Meeting materials would be circulated a week in advance, and no change of meeting location or arrangement would occur less than two weeks before the meeting date.

8) Summary of actions

WG Member	Action No.	Action	Due
SB	135	Update the minutes from meeting 32 and circulate to the WG for approval	COMPLETE
SB	136	Review the GC0079 distribution list	22 Oct 2015
GS	137	Update the ToRs following WG comments and circulate prior to taking to GCRP/DCRP in September 2015	COMPLETE
GS	138	Clarification of the LFCR requirements to devise a RoCoF operating standard	23 Nov 2015
GS / SB	139	Publish Ecofys final report to the WG website	22 Oct 2015
AD	140	Finalise report and circulate to WG for final comments	2 Oct 2015

DRAFT

Attendees		
Name	Initials	Company
Mike Kay	MK	Chair
Martin Lee	ML	SSEPD
Graham Stein	GS	National Grid (Alternative chair)
Scott Bannister	SB	National Grid (Technical Secretary to 1/9/15)
Gareth Evans	GE	Ofgem
Adam Dyško	AD	Uni. Strathclyde
Paul Newton	PN	EON
Miguel Bernardo	MB	UKPN
Jacob Allinson	JA	RWE
Campbell McDonald	CM	SSE Generation
Ioannis Koutsokeras	IK	SP Energy Networks
Sam Turner	ST	Northern Powergrid
Greg Middleton	GM	Deep Sea Electronics
Apologies		
Mick Walbank	MW	Northern Powergrid
John Ruddock	JR	Deep Sea Electronics
Alastair Martin	AM	Flexitricity
John Turnbull	JT	EDF Energy
Ken Morton	KM	HSE
Andy Hood	AH	WPD
Lorna Short / Mick Chowns	LS / MC	RWE
Kevin Burt	KEB	UKPN
Joe Duddy	JD	RES