

G5/4-1 Review Group

A Joint GCRP/DCRP Working Group

Thursday 28th June

10.00 – 15.00

Holiday Inn Hotel

Leamington Spa

Attendees:

Attendee	Affiliation
Graham Stein (Chair)	National Grid
Joseph McCullagh (Secretary)	National Grid
Ahmed Shaifu	Siemens T&D
Cliff Forbes	Danfoss
John Reilly	EdF Energy
Ron Cordwell	UK Power Networks
Simon Scarbro	Western Power Distribution
Mike Thong	Fairford Energy
Danson Michael Joseph	National Grid
David Lyon	Blue Transmission Ltd
Gavin Baxter	Northern Power Grid
Darren Jones	Electricity North West
Geoff Brown	ABB
Awais Lodhi	UK Power Networks
Andrew Oliver	TNEI
Sarath Wijesinghe	RWE

Agenda

1. Welcome and introductions
2. Work Package Update
3. "G5/5" – draft document review
4. ETR 122 – Scope of Work
5. Offshore Transmission – Roles and Responsibilities
6. Date of next meeting
7. Any other business

Minutes

1. Welcome and Introductions

Graham Stein briefed the group on the agenda and introduced Danson Michael Joseph and Joseph McCullagh as new members for National Grid. Joseph McCullagh will take on the role as secretary responsible for minute taking, meeting organisation and chasing up of actions. New members Ron Cordwell, Mike Thong, David Lyon, Gavin Baxter, Awais Lodhi, and Andrew Oliver were welcomed.

2. Work Package Update

Graham Stein presented slides prepared by Andrew Bower of EA Technology Limited (EATL). The slides outlined the 2 work packages undertaken by EATL. The 1st work package was aimed at finding a way to limit the scope of a Stage 3 assessment and make it more efficient. The 2nd work package was TSO focused and concentrated on higher order harmonics.

It was commented that EATL won the contract to carry out these packages of work due to their expertise in such areas of study. It was also noted that funding for the work has been approved under Energy Network Association (ENA) governance.

A 3rd work package has been proposed by Lionel Mackay into perceived inconsistencies between planning and compatibility levels. Funding approval is pending for this work.

The point was raised that the drafting of G5/5 may need a separate work package due to its scale.

Graham Stein took the group through the slides. Stage 1 of Work Package 1 was effectively completed in January 2012. Stage 2 of the work is to begin involving literature review of international standards including policies and procedures aiming to identify:

- Experiences of applying alternative approaches to the assessment of connections
- Approaches to modelling and the data requirements
- Approaches to the assessment of background harmonics
- Effects of different approaches to emissions allocation

It was felt that the application guide needs considering as part of this work. See slides for more information.

Action (Joseph McCullagh) – clarification from Andrew Bower needed surrounding the measuring and sampling period and selection of outages. Also voltage droop needs explaining.

Andrew Bower is to complete literature review, present to the group and publish report.

Action (Graham Stein) – obtain from Andrew submissions date for report and presentation.

Scope of Work Package 1 remains untouched and pending results. It was felt that the measurement and monitoring work should be separated from G5/4-1 and remains in ETR122. Further explanation was given to the reasoning behind 2 separate documents and the consensus was that there were good reasons for the contents of the two documents being in separate areas.

It was commented that ETR122 needs restructuring although much of the content is still be valid. Concerns were raised that developing a single guide for all users of G5/4 may be impractical given the diversity of users. The group acknowledged the challenge of satisfying the requirements of a range of stakeholders in a single guidance document.

Work package 2 entails:

- Literature review on emissions above the 50th harmonic
- Transducer limitations
- Propagation of higher order emissions
- Desktop analysis included in scope

It was suggested that an investigation in to the saturation of current transformers is required as well as the modelling of harmonic emissions. It was felt that the group needed to certainty over the time of the results of the work from EA technology limited to make further progress.

The Group noted the timescales quoted in the 'Overall Plan for Completion' slide (number 16 in the pack).

3. "G5/5" – draft document review

The draft G5/5 document was prepared by National Grid and the aim of this agenda item was to establish what needs to be done to the document for it to be ready t be published.

It was suggested that the task of producing a G5/5 version was beyond the remit of the group. It was clarified that the group intends to produce an illustrative draft to bring to the Grid Code and Distribution Code review panels.

The following comments, suggestions and questions were put forward in discussion:

- Tables 16 - 19 of section 7.5.2 goes before section 7.3 alongside the flowchart
- Availability of fault level at PCC
- Clarity needed around table 15
- Numerous tables can be consolidated in to one table of per unit values
- 20kV and 22kV tables can be removed
- Stage B needs addressing in general
- Should we be considering different audiences?
- Clarification needed surrounding non-linear and inductive load; customers need to be aware that they must comply when connecting additional load
- Impedance loci are not provided up to the 100th harmonic from DNOs. This is explained in ETR122
- Text needed to imply that harmonic emissions are quoted at the PCC and includes all plant associated with the connection
- Background modification of harmonics needs referencing in stage C
- Explanation of the increase to the 50th needed and how it may not be applicable to many users
- Does section 9.5.3 apply to connections that don't meet IEC 61000-2 and 61000-12? This may be confusing for industrial applications
- Section 9.5 needs significant rework
- Should G5/5 and ETR122 be issued as a package with ETR122 as guidance?
- Values of table 14 are misleading and are not accurate
- Section 7.4 refers to up to the 5th and all triplens but should refer to all harmonics as non-triplens may exceed the THD
- Flow diagram need not be split between stages A, B and C
- Section 6.2.3 PWHD should be in current and not voltage
- Moving from 50th to 100th requires calculations models need updating
- PWHD should be referenced in Stage B also.

Additional comments, suggestions and questions to be sent to National Grid.

Action (All) – Review and provide further comments on the draft G5/5

4. ETR 122 – Scope of Work

The following suggestions, notes and concerns were made in regards to ETR122:

- No examples are given for stage 3 connections whereas there are for stages 1 and 2
- A loophole was highlighted in where a stage 2 example of a 33kV PCC which should be a stage 3
- No discussion within ETR122 surrounding the type of connection e.g. spur, ring etc...
- ETR122 could be inserted as an appendix to G5/5

A decision was reached to amalgamate G5/4-1 with ETR122 in to one report and produce as one illustrative draft document referred to as G5/5.

5. Offshore Transmission – Roles and Responsibilities

Graham Stein gave a presentation on the timescales associated with harmonic assessments. It was communicated that some developers have expressed concerns over taking on responsibility for carrying out the harmonic assessments.

Concerns surrounding the provision of data to the relevant parties were raised. National Grid provided their understanding of the roles and responsibilities in the new OFTO regime and stressed that it was no easier for them to obtain data.

The questions surrounding where the responsibility lies for deciding whether a filter is switched in or out was answered by National Grid in that it lies with the Transmission Owner. It was felt that G5/4-1 does not prevent harmonic assessments from being carried out in the OFTO regime but requires work to develop it further. However, it was suggested that this may be beyond the Terms of References (ToR) of the group and that the issue may require expert input which the working group was not in a position to provide.

It was suggested that a separate workshop would be needed to establish data provisions and commercial arrangements in the new OFTO regime.

Action (Graham Stein) – consult with the DCRP and GCRP on a separate workshop on roles and responsibilities

6. Date of next meeting

September 20th 2012

7. Any other business

The possibility of dropping Recommendation from “ER” was suggested. There was no decision made.

The cost of downloading an Engineering Recommendation from the ENA website was discussed and suggested that the price be reduced or removed. It was agreed that this to be suggested to the board of ENA.

Action (GS) – check the status of discussions on the cost of Engineering Recommendation download.