

G5/4 Review Group

A Joint GCRP/DCRP Working Group

**Notes from 2nd Working Group Meeting, 19 January 2011
Held at Honiley Court, Warwick**

Present

Graham Stein	National Grid (Chair)
Simon Scarbro	WPD
Steve Barker	GAMBICA (Siemens)
Ertugrul Partal	National Grid
Jim Morrell	CE-Electric
David Johnsen	DONG Energy
David Crawley	ENA
Hamish Dallachy	SP
Lionel MacKay	UK Power Networks
John Reilly	EdF Energy
Alan Barlow	Magnox
Neil Fitzsimons	IPNL
Graeme Bathurst	TNEI
John Smart	SSE
Geoff Brown	GAMBICA (ABB)
Cliff Forbes	Danfoss
Alan Mason	REPower
Ahmed Shafiu	Seimens

Welcome and Introductions

Working Group Members gave brief introductions covering their role in the group. Graeme Bathurst and Cliff Forbes were welcomed as first time attendees. The Chair proposed a change to the order of items on the agenda such that sub-group business was discussed prior to the 'Location of Filtering' item. Lionel Mackay asked that an additional item be raised, in relation to areas of the terms of reference that had not yet been discussed. The group agreed to these changes.

Notes and Actions from the Previous Meeting

The notes of the previous meeting were reviewed and agreed to be accurate.

Actions

Action: EP to assess what changes to G5/4 are required as a direct consequence of changes to documents referenced by G5/4.

Ertugrul Partal gave a brief presentation reiterating the European Norms, Technical Recommendations and Technical Reports referenced in G5/4-1 and stated that no direct consequential changes could be identified that were mandatory.

Action Complete.

Action: All to consider the viability of alternative options for (the location of mitigation measures for) further discussion at the next meeting.

Action ongoing. See agenda item.

Action: JG to consider how to develop a recommendation on monitoring standards and processes.

Ongoing.

Action: SS to circulate information relating to experiences in Australia.

Action Complete – circulated in October 2010

Action: Subgroup to report back to next meeting.

See Agenda Item.

Agenda Items

Item 4 Sub-Group Report

Ertugrul Partal gave a brief presentation summarising sub-group discussions over three meetings. These covered the issues set out in the previous working group meeting:

- Establish a clear view of current practice in relation to allocation of rights both transmission and distribution.

Discussions within the group, and queries raised with network owners suggested that parties felt they followed the processes required of them by G5/4-1 and ETR122, but did not have enough information to be confident that detailed technical evaluations were being carried out consistently by different companies. Allocation of rights was to be discussed further in the subsequent presentations.

- Review and conduct a technical evaluation of ‘Assessment Procedure before connection’ and suggest what other downstream/upstream nodes (busbars) should be included and what others should be disregarded apart from the PCC (ie.1 up, 1 down?); and
- Suggesting what needs to be considered with regards to ‘defining harmonic voltage distortion limits beyond 50th and below 100th harmonic orders.

The sub-group felt that in depth research was required to address these questions and had developed proposals for research work as part of the ENA's research and development program on the topics:

- " Limitation of number of remote busbars considered in Stage 3 harmonic assessments" and
- "The necessity of evaluating harmonic levels above 50th harmonic order"

These were being presented to the ENA's meeting on the same day by Darren Jones.

There would be an opportunity to comment on these proposals through the ENA's processes then the project proposals would be circulated to the Working Group for comment.

The Working Group was generally supportive of these proposals, but was keen to have an opportunity to comment on the proposals before work was started.

Post meeting note: Darren Jones presented the IFI proposal to the ENA IFI Group and it was positively received. Confirmation on funding is awaited.

Allocation of Rights Discussion

'Scenarios at LV/MV'

Simon Scarbro led a discussion on the allocation of rights at LV/MV, by discussing IEC TR 61000-3-6 as compared to G5/4. A number of issues were highlighted:

- Regarding the concerns of some customers about the 'first come, first served' basis, they could equally be concerned by being given a restricted allocation if they were first because of the higher costs this could imply.
- Complexity with respect to MV & HV appears to be greatly increased in IEC TR 61000-3-6. It is unclear how the future load growth would be taken into account.
- For customers having a low agreed power, impractically low limitations may arise
- For distribution systems with long cables and overhead lines customers connected at some distance down the line could be disadvantaged in some cases
- It's not obvious how growth in harmonic background levels due to large numbers of LV customers could be managed
- IEC TR 61000-3-6 Stage 2 section 8.2.1 appears to give lower limits than currently permitted by G5/4-1.
- IEC TR 61000-3-6 Stage 2 section 8.2.2.1 necessitates the use of a transfer coefficient, which is not known and seems to require modelling to derive this for accuracy. Thus this is more complex.

Simon concluded that while the Equal Rights approach of IEC TR 61000-3-6 and First Come, First Served approach of G5/4-1 have pros and cons, he saw the application of Equal Rights at LV/MV level as challenging to implement.

'Scenarios at HV/EHV'

This discussion was led by Ahmed Shafiu, and again compared IEC TR 61000-3-6 and G5/4, this time at 132kV and above, summarising the pros and cons of each. It

was proposed that G5/4 should allow for alternative approaches should be taken, with equal or 'proportional' rights being allocated where connection applications interact.

Summary and Conclusions

The general feeling of the group was that there was potential for an 'equal' or 'proportional' rights approach to be taken at 132kV and above. This approach could help reduce the costs and risks faced by later connectees but has the disadvantage of perhaps imposing too onerous a requirement for the connections that came first. A hybrid approach was also discussed.

A number of other points were made:

- That assessments should be as simple as possible;
- Complexity may be necessary if this frees up more capacity;
- Including options within G5/4 could lead to unhelpful uncertainty;
- More work was needed to work out the basis on which 'proportional rights' could be allocated.

Action: Graham Stein to consider work required for the next Working Group meeting to develop equal or proportional rights approaches.

It was agreed that the sub group had completed their action and they were thanked for their contributions.

At this point, the opportunity was taken to review the terms of reference as requested by Lionel Mackay. Lionel highlighted that a number of points had not been tackled yet including:

- Clarification on the criteria used to measure and predict the applicable level of background distortion to be used in an assessment e.g. whether using background measurements based on a minimum of 1 week is valid
- What if existing background level already exceeds PL?
- Are the harmonic levels in the current version of G5/4 adequate or acceptable?
- How to assess harmonic levels for fluctuating loads

Lionel Mackay and the existing members of the sub-group agreed to develop a way forward on these points.

Action: Ertugul Partal to arrange first sub-group meeting
Action: Sub-group to report to next meeting

Location of Filtering

The group had a brief discussion on the location of filtering. This item timed out and it was agreed to discuss this topic at the next working group meeting.

Action: Graham Stein to nominate working group members to prepare material on this topic for the next meeting.

Stage 3A Assessment

Not discussed at this meeting

Date of Next Meeting.

The next meeting will be held on May 10th at the Honiley Court Hotel near Warwick.