Approved Minutes of the Sixth Meeting of the ER P28 Joint GCRP and DCRP Working Group

4th November 2015

Held at the EIC, 10th Floor, 89 Albert Embankment, London, SE1 7TP

1. Welcome, Introductions

GE welcomed everybody to the sixth meeting of the ER P28 Joint GCRP and DCRP Working Group (WG) to review the case and proposed scope of review of ENA Engineering Recommendation P28 Planning Limits for Voltage Fluctuations caused by Industrial, Commercial and Domestic Equipment in the UK (P28).

Attendance, apologies and absences were noted (see Appendix B for Attendance List including member initials).

2. Address by the Chair

GE thanked the WG members for their contributions and presented the agenda (see Appendix C for Agenda)
[Document reference: P28 WG_Paper_6_1_Agenda_P28 WG_Meeting 6_041115_v0.1]

The purpose of the meeting was fivefold:

- To debate proposed recommendations for Phase 2 Review report (section 5)
  - The WG will be given another opportunity for comment before it is issued to the DCRP and GCRP for final approval
- To confirm membership of sub-WGs (section 6)
- To discuss Planning Limits for Rapid Voltage Change (SSc) (section 7.1)
- To discuss the relevance of current Stage 2 Methodology Assessment within P28 revision (section 7.2)
- To discuss simplifying the procedure for Stage 3 Apportionment of Headroom (FG/SSc) (section AOB)

There were no comments.

3. Update/Actions from Last Meeting

It was agreed the draft minutes were a fair and accurate account of the previous meeting and could be published in the public area of the DCode website subject to the following amendments:
[Document Reference: P28 WG_Paper_6_2_ P28 Meeting Minutes and Actions_030915_v1.0 Issued]

- Page 2 Action 4.5 Proposal by DV (see slide 13) reword “Load flow not easy” to “Defining system capacity is not an easy task” (FG)
- Page 5 Action 5.4a KL to send revised wording in line with:
  - IEC 61000-3-3 is applicable to electrical and electronic equipment having an input current equal to or less than 16 A per phase, intended to be connected to public low-voltage distribution systems of between 220 V and 250 V line to neutral at 50 Hz, and not subject to conditional connection. Equipment which does not comply with the limits of this part of IEC 61000-3-3 when tested with the reference impedance Zref and which therefore

cannot be declared compliant with IEC 61000-3-3 may be retested or evaluated to show conformity with IEC 61000-3-11. IEC 61000-3-11 is applicable to electrical and electronic equipment with rated current < 75 A but is primarily applicable to electrical and electronic equipment having a rated input current from 16 A up to and including 75 A and is subject to a conditional connection. It should be noted that equipment tested under IEC 61000-3-11 can connect via the unconditional connection route if the equipment meets the technical requirements of IEC 61000-3-3

ACTION 6.1: Send GE revised wording for Action 5.4a draft P28 Minutes & Actions 03.09.15 section 8.1.3 Electric Vehicles (KL)

ACTION 6.2: Subject to the agreed amendments publish the approved minutes from P28 meeting no. 5 03.09.15.15 on the DCode website (GE)

GE presented an update on the actions from the last meeting.
[Document Reference: P28 Meeting Minutes and Actions_030915_v1.0_Issued_Update]

GE noted the actions highlighted in green have already been actioned. The following are outstanding:

- Action 5.3 FG to progress
- Action 5.5 GE to progress
- Action 5.8 GE to progress
- Action 5.11a completed in meeting see Paper 6.10 relating to changing transformers and the effect on flicker
    - KL confirmed results are from one manufacturer only
    - Found not to be huge difference with 8% increase inrush
    - PTh found no impact on windfarms as they are designed to the threshold
    - MH thought there could be an impact on transformers used for PV (1.8 – 3.2 MVA). These transformers are in the low loss category

Given the time constraints it was agreed GE would review the outstanding actions from previous meetings with a view to closing them.

ACTION 6.3: Review outstanding actions from previous meetings (GE)

4. Terms of Reference (ToR)

[Document Reference: P28 WG_Paper_6_3_ER P28 WG_ToR_v2.2_Issued]

GE confirmed these had not changed since the previous meeting.

There were no further comments on the ToR.

5. Review Amendments to Phase 2 Review Report for ER P28 – Recommendations for Revision

GE presented the updated draft Phase 2 Review Report for ER P28 – Recommendations for Revision
[Document Reference: P28 WG_Paper_6_4_ENA_EREC_P28_Ph2_Report_v2_Draft]

It reflects the amendments agreed in the previous meeting shown as tracked changes (see action 5.4).

It was agreed there should be a formal version control to distinguish this revision from the original P28 document. GE explained the current ENA format would be:

- P28 Issue 1 original P28
- P28 Issue 2 current revision
- P28 Issue 2 A1,A2 etc for minor amendments/corrections
- P28 Issue 3 next full revision

ACTION 6.4: Ask David Spillett ENA Engineering Policy & Standards Manager to confirm the official version control required for P28 (GE)

PTh asked about what fault level would the limits in P28 would refer to. Following discussion the intention was to use the actual fault level (see P28 Phase 2 Report).

A round the table discussion followed, with a summary and associated actions captured below:

Page	Ref	Title	Comment	No.	Action
7	4.2	IEC & Equivalent BS EN Standards	Confirmation of detail is required due to subtle distinctions (SSc)	6.5a	Reword section 4.2 and send to GE (SSc)
8	4.4	IEEE Standards	What value does this statement add? (FG)	6.5b	Reword section 4.4 to include why IEEE standards are considered as limited value in this revision (GE)
8	4.5	Multiple Equipment Installations	Why is SSEG mentioned? Reference to generation should be removed from this paragraph (2 occurrences) (KL)	6.5c	Reword section 4.5 - remove SSEG in 1st occurrence and change 2nd occurrence to "disturbing load" (GE)
8	4.5	Multiple Equipment Installations	A copy of the multiple installations report would be useful (SSc)	6.5d	Section 4.5 ask DC to distribute presentation from Maintenance Committee on multiple installations (GE)
8/9	5.1	Limits - General	What is the definition of normal operating conditions?	6.5e 6.5f 6.5g	Section 5.1 advise GE of the definition of operating conditions in IEC (relates to comment on credible outage conditions) (DV) Section 5.1 clarify alignment of definitions in P28 with IEC and add a footnote with IEC definition (GE) Section 5.1 reference P2/6 (GE)
9	5.2	Voltage Limits	An explanation of why a probabilistic approach is recommended in the 1st paragraph. Flicker addresses it in a probabilistic way (DV) A deterministic approach would incur financial issues (JD). Need to define upper absolute limits that cannot be exceeded thereby providing safety limits (FG)	6.5h	Section 5.2 amend wording to explain why a probabilistic approach is preferred where absolute limits are defined and why a probabilistic balance of risk is not unduly pessimistic (GE)
9	5.2	Voltage Limits	RVC is not referenced in the Distribution Code as stated in the 4th paragraph (JD)	6.5i	Section 5.2 remove "Distribution Code" from 4th paragraph (GE)

9	5.2	Voltage Limits	With regard to laboratory tests change the wording to the impact on equipment immunity, protection settings and visual impact (SSc) There is a Norwegian paper by SINTEF which documents the % of population that would be effected by RVC, mainly due to equipment immunity but covers the impact on protection and the visual impact depending on frequency (FG)	6.5j 6.5k	Section 5.2 change TNEI comments in 4th paragraph to "...laboratory tests, the impact on equipment immunity, protection settings and visual impact will need to be considered" (GE) Section 5.2 send GE the Norwegian SINTEF paper on RVC (FG)
11	7	"First-come, first –served" versus Allocation of Rights	See below	6.5l	Section 7 add IEC approach quoting proportional allocation of rights subject to having a documented justification (GE)
Should P28 align with EREC G5 Harmonics using their ToR along with the IEC approach noting it is a fairer but not simpler approach? (SSc/MB) The WG had no strong objections of moving to an apportionment approach but agreed evidence was required illustrating the negative impact of continuing with the current system with a rationale for changing to apportionment referencing IEC, G5 and the impact of multiple installations. An implementation plan for the new approach needs to be considered (MH) How will existing allocations be determined? Will the new approach apply to retrospective installations? Discussed legality of background levels and what can be increased. How is this issue currently addressed? Existing connectees could exceed the allocation – it was agreed this is a contentious area that requires further discussion					
12	8.1.2	Heat Pumps	This section needs to be more general (SSc) – agreed to remove specific reference to SSEG and heat pumps	6.5m	Section 8.1.2 add a general section for future connections which are dependently controlled. Remove specific reference to SSEG and heat pumps (GE)
12	8.1.3	Electric Vehicles	Requires rewording (KL)	6.5n	Section 8.1.3 send GE a reworded section 8.1.3 Electric Vehicles (KL)
13	8.1.5	PV (Solar)	Flicker characterisation for PV is not as well defined as it is for wind (JD). PTh stated variable speed for wind turbines is not an issue. PTh was unsure whether small/medium scale synchronous generators were effected by variable wind speeds	6.5o	Section 8.1.5 ask Renewable UK if there are problems with small/medium scale synchronous generators and variable wind speeds - feed this information into the Measurements sub-WG (PTh)
14	9	Conclusions	Last paragraph – LV has been omitted (MH)	6.5p	Section 9 add LV to the existing HV, MV and EHV systems listed in the last paragraph (GE)
			P28 revision will reference P2 Security of Supply which is also currently being reviewed	6.5q	Contact P2 WG confirming P28 revision will reference P2 (GE)

ACTION 6.5: Make amendments 6.5 a-q to Phase 2 Review Report for ER P28 and circulate to WG for final approval (GE)

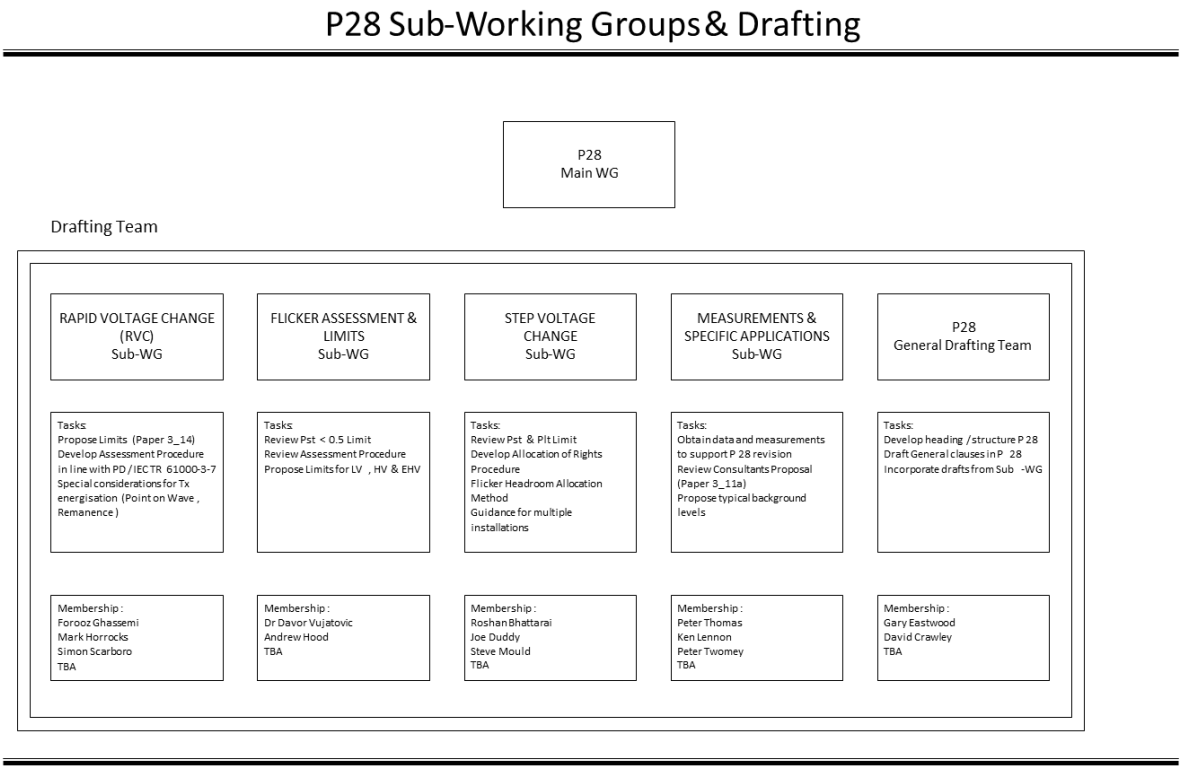
It was agreed to accept the changes in the current draft v2 and use track changes for the amendments listed in the above table. The deadline for approval will be before the next meeting in January 2016.

6. Proposed sub-WGs Phase 3 Revision

6.1 Membership

The sub-WG structure has been agreed as shown below.

GE noted there are other members who have offered to assist. GE will finalise the memberships and circulate the list.



6.2 Terms of Reference

GE will prepare and issue the sub-WG ToR with timelines and objectives. It is the responsibility of individual sub-WGs to arrange meetings and report back to the P28 WG.

ACTION 6.6: Prepare and circulate the sub-WG ToR, timelines and finalise the memberships (GE)

7. Proposed sub-WGs Phase 3 Revision

7.1 Planning Limits for Rapid Voltage Changes (Paper 3-14)

SSc presented the paper which proposes planning levels for RVC for inclusion in P28 revision.
[Document Reference: P28 WG_Paper_3-14_Action 2.10_PLANNING LIMITS FOR RAPID VOLTAGE CHANGES rev1 PDF version]

It was stated the GC0076 definition of RVC was used in the paper and aligns with IEC methodology.

There are few papers published on customer equipment immunity to RVC. The data in Figure 2 is from an ERA publication on voltage dips. Below the thick black ITIC curve equipment stops working. Variable speed drives were found to represent the most sensitive equipment. It was noted SSc has visited customer sites looking at tolerance to voltage dips.

Unbalanced voltage dips were discussed but there is limited information available (Figure 3). Curve types A and B relate to transformer energisation. Some equipment is not tolerant if the dip is too big. Papers recommend 80% refined voltage balanced dip events and 75% for unbalanced events. However this may not cover all equipment. From this information it is possible to calculate the levels of RVC which are acceptable.

Note: Following the WG discussion it is not clear whether nominal voltage or statutory minimum voltage are used.

SSc gave a summary of the tables in the paper:

- Table 1 used 10% statutory limit to reflect proposed change by DECC. Used 50% probability and 10% case for mag inrush (less than 2 s)
- Table 2 the curves show how G59 protection may be affected by voltage dips
- Tables 3,4,5 show tolerance for G59 protection
- Tables 9,10,11 show over voltage settings – more than 5% can cause a problem

In summary, it was found that G59 protection and equipment could potentially be at risk if the right values are not used.

- Table15 shows RVC limits used by the Norwegian Regulator based on the visual impact of RVC – study looked at 4-5% which is higher compared to UK
- Table 16 shows DCode step voltage planning limits
- Tables 17,18 highlight a disparity between P28 and IEC
- Table 19 aligns with IEC Standard
- Table 20 shows RVC limits proposed in NGET consultation GC0076 (now implemented)
- Table 21 shows proposed RVC planning levels for EREC P28 revision

Looking specifically at Table 21 below is a summary of the points discussed:

- Proposed planning levels are set below the immunity levels of customer equipment and below G59 protection settings
- Consideration has been given to limit the visual impact and the range of limits applied internationally
- G59 protection operation considered to be no more than once every three months
- Ratio of transfer coefficients were used to derive values
- +5% in MV column taken from Table 11 of the Paper
- n≤6 per 2 hours with Pst=0.5 gives 0.4 Plt (noting there are rounding issues)
- Discussed alignment with Grid Code – these calculations were done prior to GC0076 review – harmonisation is needed
- Issue raised about reality versus a planning document - should an operator be at risk of sanctions which are outside their control? (JD)
- Voltages based on phase voltage (RMS) to earth – maximum voltage in Grid Code
- Confirmed voltages were measured over one cycle refreshed at half cycle in accordance with BS EN 61000-4-30
- Provides flexibility in values for sub-WG to consider

The P28 WG thanked SSc and agreed this paper was a useful piece of work and provided a good basis for the RVC sub-WG to consider.

7.2 Stage 2 Assessment Methodology

The principles for the existing assessment methodology are based on:

- Value of P_{st} = 0.5 at PCC
- Allows for the connection of 8 items of equipment without exceeding P_{st} = 1.0 limit (assuming co-incident voltage changes are small)

There was a discussion on whether the application of the Stage 2 limit is still valid.

The consensus of opinion was there is no issue with the limit itself and it is not at odds with IEC Standard.

However it was agreed there should be more robust guidance on the criteria around using Stage 2 i.e. it is better to have rules defining connections that apply to Stage 2 than those that do not. It is possible the Stage 2 Assessment could provide different limits depending on the loads and summation factors.

ACTION 6.7: Consider different P_{st} levels for different loads and what rules/situations would be covered in the Stage 2 Assessment Methodology (All)

Although it is hard to foresee circumstances with more connections, a more detailed assessment would be required.

The question of who would pay for the cost of the studies was raised (MB). It was agreed such costs would apply to DNOs and customers and although apportionment would be more expensive for DNOs to manage it was thought not to be significant *and* it would make better use of capacity. MH suggested customers could pay more for background levels.

8. Project Plan

[Document reference: ENA_EREC_P28_Ph1_PID_v1_Issued]

GE will update the plan as the WG is currently four months behind. A detailed plan for Phase 3 Revision Phase will be developed with a revised end date of December 2016.

ACTION 6.8: Develop a detailed Phase 3 Revision Plan (including deadlines for sub-WGs) (GE)

9. General Management/Administration

Arrangements for general management and administration have not changed since the previous meeting except to note the WG secure access area on the ENA website is now operational. It will not use https:// which will assist those members of the WG who are unable to access Dropbox. GE has issued the link and login details.

9.1 On-line Repository Requirements

- Public access
  - Hosted by ENA on the DCRP website
  - Administered on behalf of the WG by the ENA Secretariat

- Access to all approved outputs from WG (see http://www.dcode.org.uk/areas-of-work/)

- Working Group secure access
  - Hosted by ENA on their website
  - Click on ER P28 Working Group
  - Enter Username and Password supplied
  - If there are any problems accessing files let GE know

GE confirmed the ENA Secretariat had uploaded all WG papers to the new P28 area on the ENA website. It was suggested having the current list of actions uploaded to the top of the page would be useful (JD).

ACTION 6.9: Upload current action list to top of ENA P28 website (MJC)

Due to time constraints the following two sections 9.2 and 9.3 were omitted from the meeting as nothing had changed since the last meeting.

9.2 Consultation Process

The following governance processes that need to be complied with are summarised below.

- Current References
  - DCRP Constitution and Rules - Standard Procedure 1
  - Electricity Networks and Futures Group (ENFG) Document Review/Approval Process (v3 Revision November 2013)
- Proposed Processes
  - Interfaces with Working Group now incorporated into revised ENFG Document Review/Approval Process
  - No initial public consultation proposed for development of ER P28 revision
  - Regulatory authorities, trade associations and IET will be given early opportunity to comment of draft P28 revision
  - Working Group will draft consultation paper for agreement by the GCRP and DCRP
  - Public consultation will only take place following acceptance of the modifications by the ENFG and joint agreement by the GCRP and DCRP

9.3 Support Requirements

The following support requirements are being provided:

- Provided by ENA Secretariat
  - Organisation and facilitation of WG meetings
  - Preparation of meeting agendas
  - Taking and distributing meeting minutes/actions
  - Preparation of briefing papers and documents
  - Preparation and distribution of WG reports and documentation
  - Collation of incoming data and responses
- Provided by Working Group Members
  - Preparation of papers
  - Response to papers
  - Specialist technical support
  - Incoming/field data

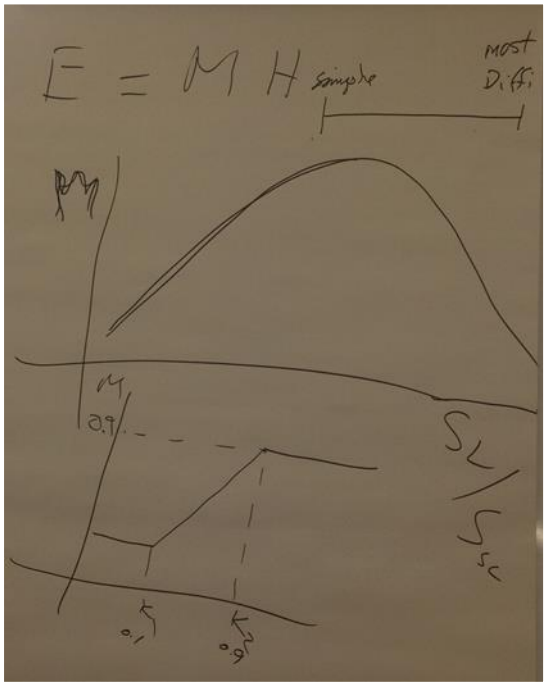
There were no other support requirements identified.

10. AOB

- **Application of G5 Allocation of Rights Proposal (FG/SSc)**

[Document reference: P28 WG_Paper_6_11_Harmonic Allocation Proposal Rev 1 SSc]

Given demand and generation customers can both produce harmonic current emissions it is important when allocating harmonic headroom to consider both possible sources to ensure that no more than 100% of the headroom is allocated



FG drew the two diagrams to help explain the proposed changes
E = M x H
E is the allocated headroom
M is the apportionment multiplier
H is the total headroom

There are problems with the top diagram given the M reduces beyond a certain value of connected load/generation

The bottom diagram shows the proposed changes where the value of M reaches a maximum value for a certain value of connected load/generation. The intention is this can be applied to flicker and harmonics

It was agreed the sub-WG should debate how to define K_1 and K_2 on the bottom axis

DV was concerned the proposal does not cater for system capacity, noting capacity is not directly linked to fault level. It was thought there is merit in addressing system capacity (including future capacity) in some respect which may require more rules around capacity. Why would you only allow 50% of headroom when there is no capacity? Is it possible to have a parallel process that takes into account fault level and system capacity? How will changes to future capacity be addressed?

It was agreed there are many challenges to work through and whether the proposed simple approach can be justified.

ACTION 6.10: Document challenges of proposed approach to allocation of rights (DV)

ACTION 6.11: Review Paper 6-11 and feedback comments to GE (All)

GE agreed to collate and circulate the responses.

Post meeting note: MB Ofgem asked what the high level cost of Stage 3 Assessment is.

ACTION 6.12: Find out the high level cost of Stage 3 Assessment (GE)

- **Membership**

GE informed the members that James Hoare representing Renewable Energy Association (REA) has had his funding withdrawn and has resigned from P28 WG. GE is currently waiting to hear back from REA.
As previously documented Sridhar Sahukari representing Energy UK has tendered his resignation. GE advised this has not been accepted until Energy UK nominates another representative.

11. Date and Venue for Future Meetings

The following dates have been proposed for future meetings:

- 12th January 2016
- 3rd March 2016
- 21st April 2016
- 9th June 2016
- 28th July 2016

It was confirmed all future P28 WG meetings will be held at:
Energy Networks Association
6th Floor Dean Bradley House
52 Horseferry Road
London
SW1P 2AF

Appendix A

ER P28 Joint GCRP & DCRP Working Group Meeting No.6

Summary of Actions from Current Meeting

Item	Action	Who	Due by
6.1	Send GE revised wording for Action 5.4a draft P28 Minutes & Actions 03.09.15 section 8.1.3 Electric Vehicles	KL	
6.2	Subject to the agreed amendments publish the approved minutes from P28 meeting no. 5 03.09.15.15 on the DCode website	GE	
6.3	Review outstanding actions from previous meetings	GE	
6.4	Ask David Spillett ENA Engineering Policy & Standards Manager to confirm the official version control required for P28	GE	

Item	Action	Who	Due by
6.5	Make amendments 6.5 a-q to Phase 2 Review Report for ER P28 and circulate to WG for final approval: • 6.5a Reword section 4.2 and send to GE (SSc) • 6.5b Reword section 4.4 to include why IEEE standards are considered as limited value in this revision (GE) • 6.5c Reword section 4.5 - remove SSEG in 1st occurrence and change 2nd occurrence to "disturbing load" (GE) • 6.5d Section 4.5 ask DC to distribute presentation from Maintenance Committee on multiple installations (GE) • 6.5e Section 5.1 advise GE of the definition of operating conditions in IEC (relates to comment on credible outage conditions) (DV) • 6.5f Section 5.1 clarify alignment of definitions in P28 with IEC and add a footnote with IEC definition (GE) • 6.5g Section 5.1 reference P2/6 (GE) • 6.5h Section 5.2 amend wording to explain why a probabilistic approach is preferred where absolute limits are defined and why a probabilistic balance of risk is not unduly pessimistic (GE) • 6.5i Section 5.2 remove "Distribution Code" from 4th paragraph (GE) • 6.5j Section 5.2 change TNEI comments in 4th paragraph to "...laboratory tests, the impact on equipment immunity, protection settings and visual impact will need to be considered" (GE) • 6.5k Section 5.2 send GE the Norwegian SINTEF paper on RVC (FG) • 6.5l Section 7 add concern about IEC approach quoting proportional allocation of rights subject to having a documented justification (GE) • 6.5m Section 8.1.2 add a general section for future connections which are dependently controlled. Remove specific reference to SSEG and heat pumps • 6.5n Section 8.1.3 send GE a reworded section 8.1.3 Electric Vehicles (KL) • 6.5o Section 8.1.5 ask Renewable UK if there are problems with small/medium scale synchronous generators and variable wind speeds - feed this information into the Measurements sub-WG (PTh) • 6.5p Section 9 add LV to the existing HV, MV and EHV systems listed in the last paragraph (GE) • 6.5q contact P2 WG confirming P28 revision will reference P2 (GE)	GE SSc GE GE GE DV GE GE GE GE GE FG GE GE KL PTh GE GE	
6.6	Prepare and circulate the sub-WG ToR, timelines and finalise the memberships	GE	
6.7	Consider different P_{st} levels for different loads and what rules/situations would be covered in the Stage 2 Assessment Methodology	All	
6.8	Develop a detailed Phase 3 Revision Plan (including deadlines for sub-WGs)	GE	
6.9	Upload current action list to top of ENA P28 website	MC	
6.10	Document challenges of proposed approach to allocation of rights	DV	

Item	Action	Who	Due by
6.11	Review Paper 6-11 and feedback comments to GE	All	
6.12	Find out the high level cost of Stage 3 Assessment	GE	

Summary of Outstanding Actions from Previous Meetings

Item	Action	Who	Due by
5.3	Produce a set of principles for proportional allocation of rights and circulate to P28 WG	FG	09.10.15
5.5	Contact LCT Group to understand how it treats flicker (xref action 5.4a)	GE	09.10.15
5.8	Ask ENA what the formal mechanism is for obtaining access to data that has been gathered	GE	Next meeting
4.12	Ask Eurelectric PQ WG about their knowledge of how other countries allocate rights	DC	09.10.15
4.14	Ask person who responded to Briefing Paper 1 regarding possible relaxation of planning limits for 'weak' networks with "hydro connections" to provide clarification of technical issue and more detail on flicker/RVC caused by these connections	GE	09.10.15
2.22	Prepare a paper of published literature research on modern lighting and flicker	JH	*28.05.15*
2.23	Email the paper on flicker and modern lighting written by professor from Finland to GE *Update: RB has emailed twice with no response*	RB	*28.05.15*

Summary of Completed Actions in Current Meeting

Item	Action	Who	Due by
5.1	Subject to the agreed amendments publish the approved minutes from P28 meeting no. 4 18.06.15 on the website	GE	25.09.15
5.2	Review and comment on Paper 5-11 Apportionment proposal and send to GE by 09.10.15	All	09.10.15
5.4	Review and amend the wording in the following sections of P28 WG_Paper_5_4_ENA_EREC_P28_Ph2_Report_v1_Draft a. section 8.1.13 Electric Vehicles 61000-3-11 can be unconditional connection b. section 5.1 General Limits remove ambiguity – should be credible operating conditions c. Introduction add background context statement outlining the shift away from traditional industries to new technologies/generation d. Review page 16 of P28 report in context of the proposed changes e. Reword section 8.1.2 of P28 report f. Give consideration to the *impact* of changing those technical issues identified in the Phase 2 Review Report	GE	25.09.15
5.6	Circulate a tracked changes version of draft P28 report for comment (see action 5.4)	GE	25.09.15
5.7	Add a new sub WG Step Voltage Change	GE	09.10.15
5.7a	Amalgamate the two Flicker sub WGs covering Stages 2 & 3 into one sub WG	GE	09.10.15

Item	Action	Who	Due by
5.8a	Contact individual WG members to request registration of interest for sub WGs	GE	Next meeting
5.9	Review the timescales for Review of P28 Phase 3	GE	Next meeting
5.10	Circulate ENA website link with username and password Let GE know whether or not P28 WG members were able to download test document	GE All	25.09.15
5.11	Sanity check mag inrush modelling with actual data (xref MH email 02.09.15)	KL/MH	09.10.15
5.11a	Look at changing transformers and differences in flicker data before and after	KL	09.10.15
5.12	Add a standard agenda item for all sub WGs to report back to main P28 WG	GE	Next meeting
4.18	Circulate paper 4.11 "P28 WG_Paper_4_11_Trench Farm pre mag tests 1" to the WG for comments	GE All	09.10.15
4.7	Summarise an alternative method of scaling a user's flicker emission to the available headroom (xref paper 4.9) *Update: closed*	PJ	09.10.15
4.8	Review Stage 2 assessment methodology in P28 to see if it is still applicable to the revision in its current form	All	GJE Comments
2.18	Refer any technical issues involving distributed generation that cannot be resolved to the DG Steering Group	GE	Ongoing
1.8	Include in the draft Agenda, issued 1 month ahead of the meetings, any invitation to include a technical guest	GE	Ongoing
1.17	Email relevant documentation and circulation list to the Secretariat (GE cc MJC) who will act as coordinator to disseminate information to WG members	All	Ongoing

Appendix B

ER P28 Joint GCRP & DCRP Working Group Meeting No.6

Attendance List
4th November 2015 EIC Office, London

Attendees:

Name	Initials	Company
Peter Twomey	PTw	ENW
Peter Johnston	PJ	NIE
Ken Lennon	KL	SP Energy Networks
Adrian Ellis	AE	SSE
Steve Mould	SM	UKPN
Simon Scarbro	SSc	WPD
Mark Horrocks	MH	Lightsource
Roshan Bhattarai	RB	Northern Powergrid
Forooz Ghassemi	FG	National Grid
Matthew Ball	MB	OFGEM
Mark Kilcullen	MK	Department of Energy & Climate Change
Peter Thomas	PTh	Nordex
Joe Duddy	JD	RES Group
Davor Vujatovic	DV	VandA Engineering Services
Gary Eastwood	GE	Threepwood Consulting Ltd
Michelle Chambers	MJC	Threepwood Consulting Ltd

Apologies:

David Crawley	DC	ENA
Andrew Hood	AH	WPD
James Hoare	JH	Renewable Energy Association
Gareth Evans	GE	OFGEM
Mark Thomas	MT	TataSteel
Tony Headley	THe	BEAMA

Absences:

Sridhar Sahukari	SS	Energy UK

Appendix C

ER P28 Joint GCRP & DCRP Working Group Meeting No.5
Wednesday 4th November 2015, 10:30 – 15:30
Agenda

1.	Welcome, introductions	**GJE**	**10:30**
2.	Address by the Chair	**GJE**	
3.	Update/actions from last meeting	**GJE/ALL**	
4.	Terms of Reference (ToR)	**GJE/ALL**	
5.	Review Amendments to Phase 2 Review Report for ER P28 - Recommendations for Revision	**GJE/ALL**	
6.	Proposed sub-WGs • Membership • Terms of Reference	**GJE/ALL**	
7.	Review • Planning Limits for Rapid Voltage Changes (Paper 3-14) • Stage 2 Assessment Methodology	**ALL**	
8.	Project plan	**GJE**	
9.	General management/administration • On-line repository requirements • Consultation process • Support requirements	**GJE**	
10.	AOB	**ALL**	
11.	Future meetings • Dates • Agenda items		**15:30**