Grid Code Review Panel

Review of Regional Differences

Background

- 1. Paper GCRP05/13 (Review of Regional Differences), submitted by National Grid, was discussed at the July 2005 Grid Code Review Panel meeting. This paper recognised the existence within the GB Grid Code of regional differences where technical or critical procedural variations meant that some differentiation became necessary between rights or obligations in Scotland and the equivalent rights or obligations in England and Wales. The paper also highlighted that the treatment of 132kV as a transmission voltage in Scotland resulted in other regional differences.
- 2. The paper identified areas within the Grid Code where regional differences existed and highlighted four principle areas that would benefit from further review:
 - a) Definition of Small, Medium and Large Power Station (incl. BC1.4.2 (a)).
 - b) Technical requirements, covering CC6, CC.A.3, Planning Code requirements, OC5, BC2.A.2.6 and including relevant definitions.
 - c) Site Safety, CC5, CC7 and CC.A.1 / OC8, including relevant definitions.
 - d) Operational processes and interfaces, mainly the Operating Codes, including relevant definitions.

Consultation Document B/06 (Regional Difference)

- 3. Grid Code Consultation B/06 (Regional Difference) proposed changes which would:
 - a) change the definitions of Large and Small Power stations in Scotland (concept of Medium abolished north of the border), with no change in the existing definitions in England and Wales.
 - b) result in the applicability of Small, Medium and Large Power Stations being based on electrical rather than a geographic basis.
 - c) relax the thresholds from 30MW to 50MW regarding the ability of Power Park Modules to be capable of "...contributing to Frequency control by continuous modulation of active Power...".
 - d) result in the hard coded thresholds for the de-minimis level for the submission of Demand PNs within the Grid Code to be realigned with the proposed new thresholds in each Transmission Owners Licensed Area.
- 4. The B/06 Grid Code proposals (along with consequential changes to the definition of Registered Capacity) were approved by the Authority on 8th August 2006 and implemented on 1st September 2006.

B/06 Consequential Changes

5. The implementation of B/06 will require consequential changes to the Grid Code to ensure consistency regarding the revised power station definitions:

- a) amend the existing definition of Control Point such that it is realigned with the amended Small Power Station definition.
- b) amend section (d) and (e) of the definition of Registered Capacity such that it allows DC Converters/DC Converter Stations to submit their normal full load in MW to one decimal place. This proposal was not implemented as part of the B/06 proposal as it was deemed outside the scope of the original consultation.

The above proposals formed part of Grid Code Consultation Document D/06 (Consequential Changes from B/06 and Housekeeping Amendments) which was approved by the Authority on 29th November 2006 and implemented on 20th December 2006.

- 6. In addition respondents to the B/06 Consultation Document highlighted two additional areas which may benefit from further industry discussion:
 - a) Demand BMU Classification currently based on geographic area, may be beneficial to amend the classification of Demand BMUs such that it refers to the electrical area. Initial National Grid analysis on the issue reveals that there are no Demand BMUs that would be subject to differing obligations if they were treated electrically rather than geographically.
 - b) Use of 'England and Wales' and 'Scotland' within the Grid Code replacement of such terms with appropriate references to transmission licensee's area/system to avoid issues being raised on geographic and electrical system boundaries.

OC8 (Safety Coordination)

7. A review is currently on-going regarding the feasibility of merging the two section of OC8 (Safety Coordination). All Transmission Owners are participating in the review; findings and/or proposals from the review will be presented to the GCRP in due course.

Outstanding Review Areas

- 8. Regarding the two remaining original areas that were identified for further analysis, GCRP is invited to consider the need at this stage to initiate a review of:
 - Technical requirement covering CC.6, CC.A.3, Planning Code requirements, OC5, BC2.A.2.6 and including any relevant definitions which may be grouped into the following areas:.
 - Voltage Fluctuation
 - Fault Clearance Time
 - Protection Equipment
 - Operational process and interfaces, mainly the Operating Codes, including relevant definitions which may be grouped into the following areas:
 - OC1 & OC2 Demand Blocks, Load Transfer capability
 - OC7 Operational Switching
 - OC9 Black Start

Any review will need to be mindful of and identify consequential changes to other codes and documents principally the CUSC, STC (including STCPs) and the BSC although any consequential amendments would of course have to be referred to and taken forward through the appropriate change governance process of those codes.

Way Forward

GCRP is invited to:

- a) Note the work which has already been completed to minimise and/or eliminate regional differences within the Grid Code.
- b) Acknowledge the revised list of regional differences attached to this paper as Appendix 1. The table highlights areas that have been completed and/or those areas that require no additional work.
- c) Discuss the need for initiating a review at this stage on the following issues:
 - Demand BMU Classification currently based on geographic area, may be beneficial to amend the classification of Demand BMUs such that it refers to the electrical area. Initial National Grid analysis on the issue reveals that there are no Demand BMUs that would be subject to differing obligations if they were treated electrically rather than geographically.
 - Use of 'England and Wales' and 'Scotland' within the Grid Code replacement of such terms with appropriate references to transmission licensee's area/system to avoid issues being raised on geographic and electrical system boundaries.
 - Technical requirement covering CC.6, CC.A.3, Planning Code requirements, OC5, BC2.A.2.6 and including any relevant definitions which may be grouped into the following areas:.
 - Voltage Fluctuation
 - Fault Clearance Time
 - Protection Equipment
 - Mvar tolerance differences
 - Operational process and interfaces, mainly the Operating Codes, including relevant definitions which may be grouped into the following areas:
 - OC1 & OC2 Demand Blocks, Load Transfer capability
 - OC7 Operational Switching
 - OC9 Black Start

Regional Differences (priority U -urgent, H /M/L, C, consequential, N no action; Number denotes sub priority)

Key: No action require Completed Proposal rejected by Authority

Code	Section	Priority	Context	Notes
G&D	Control Point	С	Applies to >50MW E&W, >5MW Scotland	Linked to the demand capacity under BC1.4.2 (a). Recommend that BC1.4.2 (a) be reviewed as a Urgent priority and this is changed as a consequence.
	Customer Demand Management Notification Level	С	12MW E&W, 5MW Scotland	OC1/2 review is proposing to remove CDM.
	Demand Control Notification Level	M	12MW E&W, 5MW Scotland	Used in OC6. Linked to the fact that GSP are generally 132/33 kV in Scotland and network is 132kV. NGET believe that it is justifiable that the limit should be different.
	High Voltage	M	>650 volts E&W, >1000 volts Scotland	The Grid Code definition for England and Wales does not appear to be consistent with rest of Industry. Review H&S issues, wider GC issues impact on other documents and bring forward changes as soon as practicable.
	Large Power Station	U 1	>=100MW E&W, >=30MW SP, >=5MW SHETL	Significant impact on all parties. This interacts with GC15 and the need for derogations. NGET to carry out an initial assessment and information gathering exercise and bring forward recommendations to progress a review. Initial plan has two threads: 1) Seek a 12 month extension to GC 15, 2) Present ToRs for a WG to July Panel, to report back to February GCRP. This affects nearly every area of the Code and the applicability of the wider framework. Note impact on requirement for EELPS to accede to CUSC is driven by the Grid Code definition of Large.

Code	Section	Priority	Context	Notes
	Local Joint Restoration Plan	L	In Scotland a LJRP may cover more than one BS Station and includes Gensets other than those at a BS Station and the creation of one or more Power Island.	The pre BETTA BS plans were adopted for BETTA go-live. In Scotland the existing procedures involved plant that was not Black Start. The framework also provides for the RTL carrying out specified control activities under a procedure. Would suggest this be reviewed when the existing Black Start plans are reviewed. NGET's initial view is that this reflects the arrangements in the STC and the role of the RTLs. This needs to be
				maintained if the RTL is to continue to carry out Black Start locally.
	Low Voltage	С	<=250 volts E&W, >50<=1000 volts Scotland	Links to 'High Voltage' and therefore take same approach.
	Operational Switching	N	To the instruction of NGET in E&W, to the instruction of Relevant Transmission Licensee in Scotland.	Required due to the switching model implemented under BETTA, RTLs issue operational instructions for switching at sites they own.
	Permit for work for Proximity Work	N	Issued by NGET in E&W, issued by RTL in Scotland	RTLs are responsible for safety at sites they own.
	Power Island	L	May include more than one Power Station in Scotland	Reflects the pre BETTA Black Start arrangements that were adopted. To be reviewed when the Black Start plans are reviewed.
	Responsible Manager	N	Authorised by the RTL in Scotland	BETTA model. Used in relation to safety and RTLs are responsible for safety at sites they own.
	Safety Coordinator	N	Nominated by the RTL in Scotland	BETTA model. Used in relation to safety and RTLs are responsible for safety at sites they own.
	Safety Rules	N	Rules of the RTL in Scotland	BETTA model. Used in relation to safety and RTLs are responsible for safety at sites they own.
	Small Power Station	С	<50MW E&W, <5MW Scotland	Linked to review of Large Power Station.

Code	Section	Priority	Context	Notes
	Transmission Site	N	Site owned by RTL in Scotland	Required to differentiate ownership. Different arrangements are required due to the role of the RTL and to allow the RTLs to carry out their obligations under the STC and other statutory documents / Licence.
	User Site	N	Site owned by RTL in Scotland (rather than NGET in E&W) and occupied by a User.	Required to differentiate ownership.
PC	PC.1.1	Н	NGET obligation under STC to inform RTL in Scotland of data required	Required under STC obligations.
	PC.6.2	L	Appendix C lists technical criteria applying to RTL in Scotland	The RTL is responsible for planning in its area. Potential benefits from convergence of criteria is regulatory and /or STC issue not for Grid Code to dictate these. Possible benefit of listing additional standards e.g. G74.
	PC.A.2.2.2	N	Single Line Diagram, Voltage differences for sub-transmission systems.	Nature of Transmission.
	PC.A.2.2.3	N	Single Line Diagram, Voltage differences.	Nature of Transmission.
	PC.A.2.2.5.1	N	Single Line Diagram, Voltage differences.	Nature of Transmission.
	PC.A.2.4.1	N	Single Line Diagram, Voltage differences.	Nature of Transmission.
	PC.A.6.2.1(f)	N	Transient Overvoltage Assessment Data, Voltage differences	Nature of Transmission.
	PC.A.8.1	N	Single Point of Connection, Voltage differences	Nature of Transmission.
	PC.A.8.3(d)	N	Voltage differences	Nature of Transmission.
CCs	CC.5.2 (c)	N	For User sites in Scotland NGET consults with RTL on safety procedures	RTL is responsible for safety on its sites and NGET needs to consult with RTL.

Code	Section	Priority	Context	Notes
	CC.5.2 (m)	N	For sites in Scotland lists of responsible persons for various duties provided.	Reflects RTL safety rules / practice. Changes initiated by Users / RTLs not NGET.
	CC.6.1.5(b)	М	Phase Unbalance, below 1% E&W, below 2% Scotland	Requires a technical review of impact, possible impact on wider design standards. Option to relax England and Wales or to tighten up for Scotland. As with most design issues retrospective application could a have serious implications.
	CC.6.1.7 (a)	M	Voltage Fluctuation, defined in Grid Code for E&W, in Scotland ER P28 applies.	Requires technical review. Assess if P28 can be applied in England and Wales without additional Grid Code obligations to supplement.
				Figure 4 in ER P28 (p. 10) gives limits for step-size as a function of time between steps (larger steps require a longer interval between steps), this limits Pst to 0.5, assuming no other sources of flicker. CC.6.1.7 allows 1% repetitive steps, but does not limit their frequency. P28 (figure 4) allows 1% steps, provided they are at least 20 s apart. P28 introduces the time dimension. On the other hand, it would allow larger steps at longer intervals. Note that P28 limits steps to 3% for repetition times above 600 s.
	CC.6.2.1.1(b)	М	Earth Fault Factor below 1.4 E&W, below 1.5 Scotland. Phase to earth voltage differences under fault conditions.	
	CC.6.2.1.2(a)(ii), (a)(iii), (a)(iv)	N	References to RTL in Scotland.	Reflects role of RTL under BETTA arrangement.

Code	Section	Priority	Context	Notes
	CC.6.2.2.2.2 (b), (c)	Н	Fault clearance time differences and voltage level differences.	Requires technical review.
				May be associated with the different licensees internal protection policies and assumptions about the number of protections / terminology.
	CC.6.2.2.4	M	Work on Protection Equipment, In E&W NGET representative to be present but in Scotland written authority from NGET suffices	As drafted this paragraph can be misinterpreted as 'written authority' sufficing in E&W as well as in Scotland. Need to review clarity of paragraph, possibly overly complex. Review whether NGET can relax, Scotland to tighten up or the difference is justifiable. Need data on how often it actually happens in Scotland / E&W. We are not aware of it causing any problems in E&W.
	CC.6.2.3.1.1 (c)(i)	M	Circuit breaker fails protection provision, voltage differences.	Need to understand why it isn't, or if it actually is in practice, applied to at 132kV in E&W. Review the technical requirement with RTLs to have it connected at 132kV. The requirement may be more about the nature of the system (i.e. active and inter connected) rather than the voltage level.
	CC.6.2.3.5	M	Work on protection equipment. Similar to CC.6.2.2.4	Similar to CC.6.2.2.4, review with CC.6.2.2.4.
	CC.6.3.7(e)(f)	M	Frequency response requirement profile, generating unit/CCGT Module completion date differences.	Review if date can be harmonised, impact on both systems. If Scottish limit moved back it implies it would be retrospective application, and the date is in the E&W because it was not seen to be viable to implement it retrospectively in E&W. Could lead to increased cost on Generators and / or increase the number of derogations required. In E+W the main impact would be that for completion dates between that current in E&W and a later date. This is unlikely to affect the actual capability delivered (the implementation date being in the past), but affect the requirement to have the capability available if the units were commissioned between these dates.
				Review the volume of plant affected on both systems.

Code	Section	Priority	Context	Notes
	CC.6.5.6(a)	С	Operational metering. In Scotland anemometer readings required from wind turbines.	Removed by Generic provisions.
	CC.7.2.1	N	In Scotland, work to Safety Rules of RTL, as advised by NGET.	BETTA model. Used in relation to safety and RTLs are responsible for safety at sites they own.
	CC.7.2.2	N	User Sites in Scotland, NGET to ensure that RTL works to User Safety Rules.	BETTA model. Used in relation to safety and RTLs are responsible for safety at sites they own.
	CC.7.2.3	N	For Transmission Sites in Scotland NGET seek opinion of RTL as to whether User Safety Rules adequate.	BETTA model. Used in relation to safety and RTLs are responsible for safety at sites they own.
	CC.7.2.4	N	For a User Site in Scotland NGET may apply to a User for RTL to use RTL Safety Rules	BETTA model. Used in relation to safety and RTLs are responsible for safety at sites they own.
	CC.7.2.5	N	Entry and access to Transmission site in Scotland by User RTL rules apply.	BETTA model. Used in relation to safety and RTLs are responsible for safety at sites they own.
	CC.7.2.6	N	User Sites in Scotland, Users notify NGET of Safety Rules that apply to RTL staff.	BETTA model. Used in relation to safety and RTLs are responsible for safety at sites they own.
	CC.7.3.1	N	Site Responsibility Schedules in Scotland reference RTL.	BETTA model. Used in relation to safety and RTLs are responsible for safety at sites they own.
	CC.7.6.1	N	Access, provisions set out in Interface agreement with RTL and Users in Scotland.	BETTA model. Used in relation to safety and RTLs are responsible for safety at sites they own.
	CC.7.6.2	N	In Scotland unaccompanied access only granted to individuals holding Authority for Access granted by RTL.	BETTA model. Used in relation to safety and RTLs are responsible for safety at sites they own.

Code	Section	Priority	Context	Notes
	CC.7.7.1	M	Maintenance Standards. E&W NGET has right to inspect test results and maintenance records. In Scotland User responsibility to ensure Users plant tested and maintained.	·
	CC.A.1.1.9	N	E&W Site Responsibility Schedule signed on behalf of NGET by NGET Responsible Manager. In Scotland SRS also signed on behalf of RTL by RTL Responsible Manager.	Reflects asset ownership and roles under BETTA.
	CC.A.1.1.6 Footnote bottom of page 27	M	Differences in dates from when details of traversing circuits are required.	Investigate harmonisation. Linked to individual safety procedures / requirements. Note implementation date: it is already implemented in E+W. Investigate possibility of agreeing and hard-coding date that is reasonable for the RTLs.
	CC.A.1.1.16	N	Responsible Managers – E&W NGET supplies name of NGET's Responsible Managers in Scotland NGET send Name of RTLs Responsible Manager.	Reflects roles under BETTA, links to CC5.2.
	CC Appendix 3 Title	С	Variation in completion dates (Relates to Frequency Response Profile and Operating Range).	Linked to CC6.3.7 dates, review with CC6.3.7.
	CC.A.3.1	С	Variation in completion dates for generating units and CCGT modules.	Linked to CC6.3.7 dates, review with CC6.3.7.
OC1	OC1.5.5.3	M	In Scotland Suppliers who control Load Management Blocks of Demand>5MW submit a schedule to NGET. Not a requirement in E&W.	Review requirement under GB arrangements and review the MW limit if arrangement justified. Possibly incorporate in longer term OC1/2 proposals.
OC2	OC2.1.7	M	In Scotland where output or demand small NGET may agree to reduce admin burden on Users of producing	Review if still required following Small, Medium and Large review.

Code	Section	Priority	Context	Notes
			planning information	
	OC2.4.1.3.4 (c)	С	Details of Load Transfer capability available to NGET –E&W 12MW or more, Scotland 10MW or more.	Review justification for different limits along with Small, Medium and Large. Note interaction with existing OC1/2 review, possibly incorporate.
OC5	OC5.5.3 (Table 3 places)	С	Relates to Phase Unbalance and Voltage Fluctuations	Links to the review of the original technical requirement in the CCs
OC6	OC6.2.2	L	In Scotland may not be possible to meet certain requirements in OC6 and NGET may agree requirements with relevant Network Operator.	Related to the definition of Transmission. Where Demand Control is implementation on a Grid Supply Point basis due to the fact that GSPs in Scotland are at different voltage level an even spread or report on a GSP may not be possible / practicable.
	OC6.6.1	L	Automatic Low Frequency Demand Disconnection – E&W at least 60%, Scotland at least 40% of total Peak Demand.	Influenced by where the relays have historically been required. Review, ensure justification robust.
OC7	OC7.1.6	С	Refers to OC7.6 Operational Switching in Scotland.	Linked to OC7.6.
	OC7.2.4	С	Refers to Operational Switching procedure in Scotland.	Linked to OC7.6.
	OC7.3.1	С	Scope says OC7.6 also applies to RTL	Linked to OC7.6.
	OC7.6	L	Whole of OC7.6 relates to Operational Switching in Scotland	Required to facilitate BETTA switching model. Review scope and applicability of obligation following experience.
OC8	OC8.1.1	N	OC8B applies in Scotland	Purpose of OC8B.
	OC8.3.1	N	Scope, OC8 also applies to RTL	Reflects role of RTLs under BETTA.
	OC8.4.1.1	N	OC8A applies when Safety precautions to be established in E&W when work to be carried out in Scotland	Recognises role of RTLs under BETTA on safety in E+W, cascading Safety Precaution cross the interface.

Code	Section	Priority	Context	Notes
	OC8.4.2.1	N	OC8B applies when Safety precautions to be established in Scotland when work to be carried out in E&W	Recognises role of NGET under BETTA on safety in Scotland, cascading Safety Precautions across the interface.
	OC8A.1.1	N	Introduction recognises OC8B exists	Not a Regional Difference as such.
	OC8B	M	Safety Co-ordination in Scotland	The procedure applicable in Scotland. Review differences between OC8A and OC8B, harmonised if possible. Main impact on Users and RTLs. Ensure relationship between CCs and OC8B is consistent. OC8B was based on SGC OC6, but the split in the SGC between CC and OC6 was different to that in the E+W GC.
OC9	OC9.2.4	N	Objective to describe role of RTL Scotland with respect to Desynchronised Island Procedure and Local Joint Restoration Procedure	Recognises RTL role
	OC9.3.3	N	In Scotland OC9.4 and OC9.5 also apply to RTL	Recognises RTL role
	OC9.4.5.3	L	Black Start Stations - In Scotland LJRP may cover more than 1 BS station and may include RTL's etc	Covers existing procedures in Scotland. Change would have a significant impact on the current Black Start philosophy. Would also need to initiate a fundamental review of the Black Start procedures. Expect to review in future.
	OC9.4.6		Under exception circumstances RTL may invoke LJRP for its own area.	Recognises RTL role, required to maintain standards.
	OC9.4.7.3		Black Start – In Scotland RTL acts on NGET's behalf	Recognises RTL role
	OC9.4.7.4	L	In Scotland Gensets which are not at BS stations but in LJRP may be instructed in accordance with the LJRP. In E&W relates to BS stations only generally.	For BETTA go-live the existing black start procedures were adopted. A review of the obligations in OC9 would need to be carried along with a licensees review of the Black Start philosophy for Scotland.
	OC9.4.7.6	С	Special arrangements for Scotland	To be considered along with OC9.4.7.4

Code	Section	Priority	Context	Notes
	OC9.4.7.11	С	LJRP establishment (a) includes RTL in discussion in Scotland. (c) details provisions in Scotland when LJRP arises.	To be considered along with OC9.4.7.4
	OC9.5.1(b)	N	In Scotland OC9.5 also provides for Transmission connected generation in De Synch Islands.	Allows for RTL to manage an island. Consistent with roles under STC.
	OC9.5.4.1(b), (c)(v)(vi)	N	In E&W De Synch Island Procedure covers all relevant GSPs. In Scotland OC9 De Synch Island Procedure also covers parts of GB Transmission System connected to Users Systems and directly connected Power Stations. Procedure – will include RTL obligations in Scotland.	Allows for RTL to manage an island. Consistent with roles under STC.
OC11	OC11.4.1.1	N	Reference to site owned by RTL in Scotland rather than NGET in E&W	Required by BETTA ownership model
	OC11.4.1.2	N	Reference to site owned by RTL in Scotland rather than NGET in E&W	Required by BETTA ownership model
	OC11.4.2	N	Reference to site owned or occupied by RTL in Scotland rather than NGET in E&W	Required by BETTA ownership model
	OC11.4.6	N	Reference to installation by RTL in Scotland rather than NGET in E&W	Required by BETTA ownership model
BC1	BC1.4.2(a)	U1	Physical Notifications required from BM Units with Demand Capacity >50MW in E&W or >5MW in Scotland	Review along with Definition of Small, Medium and Large Power Station
BC2	BC2.5.5.1	С	Demand Capacity <50MW in E&W or <5MW in Scotland	Related to BC1.4.2(a)
	BC2.5.5.2	С	Demand Capacity >50MW in E&W or >5MW in Scotland	Related to BC1.4.2(a)

Code	Section	Priority	Context	Notes
	BC2.A.2.6	Н	Mvar tolerance difference	Review along with Technical requirements
DRC	Sched 1 Page 3	С	Negative sequence resistance required in Scotland	
	Sched 5 Page 1	С	Operating Voltage differences	
	Sched 5 Page 2	С	Operating Voltage differences	
	Sched 5 Page 5	С	Operating Voltage differences	
	Sched 5 Page 7(f)	С	Operating Voltage differences	
	Sched 6 Page 1	С	Load Transfer capability 12MW E&W, 10MW in Scotland	
	Sched 12 Page 1	С	Load Management Blocks of >5MW in Scotland	
GCs	GC.4.2(f)	N	Carry out review of Regional differences.	Consistent, seek to remove if all material regional differences. removed.
	GC.4.3(c)(iv)	N	Scottish Network Operators rep on GCRP.	BETTA model.
	GC.15.1(b)	U1	Applies to Embedded Exemptable Medium Power Stations in Scotland until 31 st March 2006.	Expires in 2006, in order to allow a review on size definitions to be addressed in a considered manner NGET propose that this be extended to 2007. When this clause expires one of the following must have occurred • A derogation have been put in place, or • The plant compliance is confirmed, or • The Grid Code obligation removed. It would be inappropriate to seek compliance or derogations prior to reviewing the size definition. Regional difference removed by LEEMPS.
	GC.A1.11(d)	N	Potential amendment to the GB Grid Code related to operational liaison including Black Start in Scotland	Transitional

Code	Section	Priority	Context	Notes
	GC.A2.7	N	Data to be provided to NGET to	
			implement with effect from Go Live	
			the GB Grid Code in relation to	
			Scotland.	