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Dear Colleague,

BETTA consultation on Non Standard BM Unit Configurations associated with Cascade Hydro Schemes and associated GB Grid Code and GB BSC drafting: Ofgem/DTI conclusions

1. In July 2004, Ofgem/DTI published an open letter consultation[1] ("the July mini-consultation") which set out proposed changes to the GB Grid Code ("the Grid Code") and to the GB Balancing and Settlement Code ("BSC") associated with the possible registration of non standard Balancing Mechanism Unit ("BM Unit") configurations in respect of 6 cascade hydro generation schemes in the North of Scotland ("the Cascade Hydro Schemes") requested by Scottish and Southern Energy Plc ("SSE"). In the July mini-consultation, Ofgem/DTI described the background to the issue as it evolved through past Ofgem/DTI consultations on the BSC under BETTA and an ELEXON consultation report[2] ("the ELEXON report") in respect of the requests received from SSE for non standard BM Unit configurations published in May 2004. The July mini-consultation then went on to set down Ofgem/DTI's views on the issues raised in the ELEXON report and to propose a way forward for the BSC and Grid Code arrangements to apply from BETTA go-live in respect of the Cascade Hydro Schemes. Appended to the July mini-consultation was proposed draft legal text to be inserted into the versions of the BSC and the Grid Code to apply under BETTA.

2. This open letter conclusions document outlines Ofgem/DTI's proposals as set out in the July mini-consultation, summarises the responses to the July mini-consultation and sets out Ofgem/DTI's conclusions. The appendices of this document contain a matrix setting out in more detail the responses to the July mini-consultation and Ofgem/DTI views on those responses and the final legal text associated with these conclusions. All non-

[1] "BETTA consultation on Non Standard BMU Configurations associated with Cascade Hydro Schemes and associated GB Grid Code and GB BSC drafting", July 2004 Ofgem 177/04a and 177/04b
[2] "ELEXON BETTA Project: Report to Ofgem/DTI on Non Standard BM Unit and Class 5 Trading Unit Consultation", ELEXON, May 2004

confidential responses to the July mini-consultation have been published on the Ofgem website.

July mini-consultation proposals and views of respondents

3. In the July mini-consultation, Ofgem/DTI expressed the view that SSE's legal and environmental obligations drive the operational management of the Cascade Hydro Schemes such that they are to be operated as a single cascade. Ofgem/DTI also identified that the defining criteria of a BM Unit and the right to request non standard BM Units are clearly set down in the BSC. Ofgem/DTI also expressed the view that the Cascade Hydro Schemes may be likened to CCGT[3] modules and thus should be treated similarly from a data reporting perspective. Ofgem/DTI proposed that the 6 non standard BM Unit configurations associated with the Cascade Hydro Schemes (each a "Cascade Hydro Scheme BM Unit") should be added to the relevant register in the BSC. However, Ofgem/DTI acknowledged that unlike a CCGT module, generating units within the Cascade Hydro Schemes may be connected to the transmission system at a number of dispersed locations. Therefore Ofgem/DTI accepted that the GB system operator will need further information about the individual generating units within the Cascade Hydro Schemes and that arrangements to support provision of this information could be delivered through changes to the Grid Code. Proposed amendments to the Grid Code text, shown change marked against that published in May 2004[4] were appended to the July mini-consultation.

4. Of the six respondents to the July mini-consultation, 2 opposed the proposed registration of the Cascade Hydro Scheme BM Unit configurations and 4 were broadly in support. A detailed account of the responses and Ofgem/DTI views on those responses is set out in Appendix 1 to this document. The following summarises the main points raised.

5. One of the respondents that opposed the recommendations made in the July mini-consultation considered that they conveyed commercial advantage on the registrant of the Cascade Hydro Schemes as the individual generating units connected at different boundary points will be able to satisfy Bid-Offer Acceptances ("BOAs") from different locations and the GB system operator may perceive higher probability of delivery or a better dynamic response. The same respondent also expressed concern that the proposed arrangements did not provide for "efficient balancing price discovery" if National Grid Company Plc ("NGC") is in a position to take into account generating unit specific Dynamic Parameter (as defined in the Grid Code) data in respect of accepting bids / offers at Cascade Hydro Scheme BM Units and that generating unit specific data is then not made available to the rest of the market.

6. The same respondent also expressed concerns as to how consistency between data submitted at generating unit level and that submitted in respect of the associated Cascade Hydro Scheme BM Unit could be achieved given that the relationship between the two is not set out in the proposed legal text and that NGC's treatment of this data is not

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[3] Combined Cycle Gas Turbine

[4] The Grid Code under BETTA: Ofgem/DTI conclusions and second consultation on the text of a GB Grid Code and conclusions on change management between the STC and each of the GB CUSC, GB BSC and GB Grid Code", Volumes 1 and 2, May 2004 Ofgem 99/04a and 99/04b

covered in the proposed data consistency rules. The same respondent also identified areas where the respondent considered there to be inconsistencies within the proposed legal drafting.

7. The other respondent who opposed the recommendations in the July mini-consultation, expressed the view that the proposed arrangements for the Cascade Hydro Schemes constituted "special treatment" and drew comparisons with other forms of generation which are "required" to manage their constraints commercially. The respondent suggested that constraints associated with compliance with environmental statutory obligations and with submitting Physical Notifications ("PN") in accordance with the Grid Code can be managed by allowing water to bypass the turbines and be spilled to the next level in the cascade. The respondent also suggested that if PN data is to be made available to NGC then it should be made available to all to maintain transparency.

8. Two respondents supported the principle of a Cascade Hydro Scheme BM Unit but commented on the detail of the proposals. One of these respondents was unable to support the instruction of mandatory services on a generating unit level on the grounds that if NGC require such a degree of control then each generating unit should be a BM Unit. It noted that such a degree of control is not required at CCGT modules. The other respondent expressed concern that the definition of "Cascade Hydro Scheme" referred to specific existing schemes rather than a generic definition and that such an approach, in its view, apparently precluded the future registration of other similar schemes.

9. The two remaining respondents expressed support for the proposals, one noting that further changes to the draft legal text may be required but that they would continue to support the proposals provided the net result remained the same.

Ofgem/DTI views on responses to the July mini-consultation and the way forward

10. Ofgem/DTI note the view of the respondent who considered that the proposals in the July mini-consultation conveyed commercial advantage on registrants of the Cascade Hydro Scheme BM Units as they would afford flexibility to registrants in their delivery of BOAs that would not be available to registrants of other types of BM Units. Ofgem/DTI understand how a BM Unit comprising multiple generating units connected at different locations may provide such flexibility but in respect of hydro schemes designed to be operated in a cascade, that is to say with generating units set up in sequence, that flexibility is significantly restricted. Ofgem/DTI also note that none of the Cascade Hydro Schemes proposed could be considered to be significant in the context of balancing the GB transmission system. In light of these factors, Ofgem/DTI consider that registration of the Cascade Hydro Schemes as single BM Units would not convey appreciable competitive advantage upon the registrant.

11. Ofgem/DTI also note the view of the respondent who suggested that by not requiring NGC to make generating unit data provided specifically by the registrant of the Cascade Hydro Scheme BM Units (data which the respondent considered NGC would use in making balancing decisions) available to other market participants would result in inefficient balancing price discovery. The registrant of the Cascade Hydro Scheme BM Units will be required to submit the same data at BM Unit level (e.g. PNs and Dynamic Parameters data) that registrants of other BM Units will be required to submit. This data

will be made available as part of Balancing Mechanism Reporting Service (as defined in the BSC)(BMRS) reporting as with any other BM Unit. Due to the locational diversity of the generating units within each of the Cascade Hydro Schemes, NGC will also require data at a generating unit level in order be in a position to effectively manage transmission system security and stability. Ofgem/DTI are of the view that it would be reasonable to draw comparisons between the Cascade Hydro Schemes and CCGT modules in light of the operational interdependencies between generating units that form part of a single BM Unit. Generating unit specific Dynamic Parameters are not made available as part of BMRS reporting in respect of CCGT modules, nor is data relating to range effects and genset linkages at range CCGTs. It would therefore seem inconsistent to treat the Cascade Hydro Schemes any differently from CCGT modules in respect of BMRS reporting.

12. Ofgem/DTI also note the concerns raised by the same respondent as to how NGC will validate consistency between the data submitted at BM Unit level and the data submitted at generating unit level in respect of the Cascade Hydro Schemes. Given that this data is submitted for different purposes, the assessment of possible actions in the balancing mechanism and the assessment of system security and stability, it is unclear to Ofgem/DTI as to why processes adopted by NGC to interpret data submitted in relation to the Cascade Hydro Schemes should be set out in the Grid Code. To the extent that NGC considers that there may be inconsistencies between the two sets of data, then there would appear to be a clear incentive on NGC as a consequence of its obligations to operate an efficient and economic transmission system and maintain system security and stability to investigate any data inconsistencies and take any action that may be appropriate.

13. Ofgem/DTI also note the views of the respondent who considered that approval of the requested BM Unit configurations would constitute "specialised" treatment drawing a comparison between pumped hydro generation and the Cascade Hydro Schemes. Ofgem/DTI are of the view that the Cascade Hydro Scheme BM Units may only be considered to be treated as specialised to the same extent as any other non-standard BM Unit configuration which are clearly within the scope of the current form of section K of the BSC. Ofgem/DTI also reiterate their view that such BM Unit configurations do not convey appreciable competitive advantage upon the registrant for the reasons set out in paragraph 10 above. With regard to comparisons, Ofgem/DTI do not consider that pumped storage generation is an appropriate equivalent to the Cascade Hydro Schemes as the generating units in pumped storage are set out in parallel whereas the Cascade Hydro Schemes have their generating units in sequence. The sequential configuration of generating units results in greater operational interdependencies between the generating units within the Cascade Hydro Schemes than in a pumped storage generation scheme. Instead, Ofgem/DTI believe that there is more of a parallel between the Cascade Hydro Schemes and CCGTs and between the Cascade Hydro Schemes and supplier BM Units. Insofar as the parallel with CCGTs is concerned, this is because in each case, the generation capability of one constituent generating unit is dependent upon the output of one or more others. In the case of supplier BM Units, the parallel with the Cascade Hydro Schemes is that the power associated with the BM Unit is imported or exported at multiple nodes on the Total System (as defined in the BSC) (and potentially multiple points on the GB transmission system). It is further noted that the BMRS does not include information setting out the off-take of each supplier BM Unit at each Grid Supply

Point (as define in the BSC), although NGC may well seek to take account of the likely impact at each Grid Supply Point of accepting an offer or bid from a supplier BM Unit.

14. The definition of the term BM Unit serves two functions in the BSC. First, in conjunction with the definition of "Trading Unit", it is used to determine whether the BM Unit Metered Volumes (as defined in the BSC) are to be treated as Production BM Units (as defined in the BSC) or Consumption BM Units (as defined in the BSC) for the purposes of imbalance settlement. Ofgem/DTI are of the view that whether or not the generating units comprising each of the Cascade Hydro Schemes are treated as one or more BM Units does not have a significant impact upon their treatment as Production or Consumption. The second function of the definition of BM Unit is to define the unit of participation in the balancing mechanism. As discussed above, the principle that changes in the import or export from a single BM Unit may have an impact at more than one point of connection to Total System (or even the GB transmission system) is already established (with supplier BM Units).

15. Despite the parallels between the Cascade Hydro Schemes and CCGTs and supplier BM Units, there are potentially disadvantages associated with treating each of the Cascade Hydro Schemes as a single BM Unit. For example, from the perspective of the user, to the extent that NGC is interested in the locational delivery of energy from the BM Unit, it may be that offers or bids from the Cascade Hydro Schemes are less valuable. There are also potential advantages, in that the output of the schemes are genuinely interactive. Within the legal framework available, it does appear that a reasonable solution can be developed which does not require a "first principles" review of the trading arrangements. Given the fact that an acceptable solution does appear to be capable of being developed for BETTA Go-Live, and in view of the likely magnitude of the impact of such BM Units in the balancing mechanism, Ofgem/DTI do not consider that it is necessary at this stage to undertake a more fundamental "first principles" review of the treatment of the Cascade Hydro Scheme BM Units, and instead believe that a solution along the lines set down in the July mini-consultation should be adopted.

16. Ofgem/DTI note the views of the respondent who was unable to support the instruction of mandatory services on a generating unit level on the grounds that if NGC require such a degree of control then each generating unit should be a BM Unit. The respondent also noted that this approach was not considered necessary for CCGTs. Ofgem/DTI accept that NGC needs the ability to despatch ancillary services on a generating unit basis in order to be in a position to satisfy its licence obligation relating to the transmission system security standard and quality of service[5] and that due to the radial nature of the 132kV system (to which the generating units within the Cascade Hydro Schemes are connected) and the fact that the generating units within one of the Cascade Hydro Schemes may be within different constraint zones, NGC needs to have the facility to despatch mandatory services at a generating unit level. CCGT modules do not have multi-locational connections to the transmission system and therefore the arrangements for instruction of mandatory services from CCGT modules are not considered by Ofgem/DTI to be an appropriate model for the Cascade Hydro Schemes. Ofgem/DTI note that reactive power needs tend to be locational and cannot necessarily be met by an

[5] Transmission Licence standard condition C17 (Transmission system security standard and quality of service)

instruction on a Cascade Hydro Scheme BM Unit basis as one of the generating units within the scheme may provide the desired effect whereas others may have an undesirable effect. As discussed above, Ofgem/DTI believe that a solution which allows each of the Cascade Hydro Schemes to be treated as a single BM Unit and yet retains the means to meet the technical requirements of NGC, without requiring a "first principles" review, represents an appropriate solution for BETTA go-live. Ofgem/DTI have been informed by NGC that where the output of a particular generating unit was required to change to provide an ancillary service, NGC would discuss this with the generator and only issue such an instruction if guaranteed of the required effect from the specified generating unit.

17. Ofgem/DTI note the view of the respondent who expressed concern that the definition of the Cascade Hydro Schemes referred to specific existing schemes rather than a generic definition. Ofgem/DTI note that the amendments to Codes which are to be made as part of this consultation are restricted by the power provided to the Authority through standard licence conditions relating to the BSC[6] and the Grid Code[7] in NGC's licence. Ofgem/DTI do not believe that it would be appropriate to use such power to make a generic change to the BSC particularly where a power to make individual decisions is already provided to the BSC Panel. The matters considered in this conclusions document reflect the need to address a particular issue that arose from the application of the BSC on a GB basis, the invitation for requests for non standard BM Unit configurations and the need for a decision in respect of such requests in the absence of a GB BSC Panel. This conclusions document constitutes the end of this particular process rather than the consideration of issues associated with the handling of cascade hydro generation in general. BSC Parties have had the right to propose modifications to the version of the BSC to apply under BETTA from the 1 September 2004 and such proposals will be considered in accordance with the BSC objectives rather than the more narrow vires of the BETTA power.

18. In light of the factors outlined above, Ofgem/DTI conclude that the BM Unit configurations associated with the 6 cascade hydro generation schemes in the North of Scotland requested by SSE should be included in the relevant register and that changes to Section I of the GB BSC should be made to effect this. A copy of the necessary changes to Annex I-2 to the BSC is set out in appendix 2. Ofgem/DTI recommend that the Authority direct NGC to make the changes shown in appendix 2 to the BSC.

19. Having considered the suggestions made by respondents in respect of the detail of the proposed changes to the Grid Code drafting, Ofgem/DTI have decided to make certain changes to the proposed drafting in light of those suggestions. Details of these changes are set out in the matrix in appendix 1 and have been reflected in the updated Grid Code drafting in appendix 3. Ofgem/DTI recommend that the Authority direct NGC to make the changes referred to in appendix 3 (and detailed in the attachment to this document) to the Grid Code.

[6] Transmission Licence standard condition C3 (Balancing and Settlement Code (BSC)
[7] Transmission Licence standard condition C14 (Grid Code)

Appendix 1 – Summary of Responses to the June 2004 mini-consultation and Ofgem/DTI views on those responses

No.	Respondent	Comment	Ofgem/DTI View
1	British Energy	Insufficient response time was afforded to allow thorough consideration of the Grid Code text.	The Grid Code changes identified are consequential on the proposal to amend the BSC in relation to non-standard BM Unit configurations and have been defined to only specifically relate to only two parties, NGC and SSE. Ofgem/DTI have closely involved both NGC and SSE in the development of the Grid Code drafting. In light of this situation, Ofgem/DTI consider that 2 weeks was sufficient for respondents to form a considered view of the proposals.
2	British Energy	Allowing generating units connected to the total system at different locations to be treated as a single BM Unit creates commercial advantage. They are different from CCGTs as connected at different boundary points and therefore will be able to satisfy BOAs from different locations. The GB system operator may perceive higher probability of delivery or a better dynamic response. Were other generators able to consolidate other resources available in the same area or at the same location they may be capable of the same reliability or response.	Ofgem/DTI are unconvinced of the likely commercial advantage that may be gained by allowing generating units that form part of a single cascade to be registered as a single BM Unit. The fact that the generating units within a single cascade share a single source of energy means that an increase in the output on one will have a consequential effect on the next generating unit in the scheme. The existence of statutory environmental obligations can only increase the operational constraints on these schemes. In the unlikely event that any commercial advantage could be gained from the registration of such a BM Unit, the extent to which such a registration could distort effective competition in the balancing market would appear to be limited in light of the size of the generating capacity of the Cascade Hydro Schemes concerned.
3	British Energy	British Energy acknowledged that the interactions between generation units within the Cascade Hydro Schemes are distinctive. Generating units within the Cascade Hydro Scheme BM Units however are not unique in not being covered by NGC's standard Dynamic Parameters. If special parameters are described to NGC in accordance with the Grid Code, these should be visible to all market participants. British Energy would	Ofgem/DTI consider that the Cascade Hydro Schemes are in this instance analogous to CCGT modules in light of the operational interdependencies between generating units. Such data is not available to the market in respect of individual generating units within CCGT modules and it would therefore seem inconsistent to apply a different approach in respect of the Cascade Hydro Scheme BM Units. In addition, range effects (switching of steam between generating units at range

No.	Respondent	Comment	Ofgem/DTI View
		prefer generating units connected at different boundary points or comprising distinct generating units to be treated as separate BM Units, so that bid offer prices and approximated Dynamic Parameters are made available to the market.	CCGT) and genset linkages have never been made available to the market. Data relating to Dynamic Parameters, as defined in the Grid Code, is to be provided at BM Unit level in respect of each of the Cascade Hydro Schemes and this will be visible to the same extent as other BM Units. To require all generating units connected at different boundary points or comprising distinct generating units to be treated as separate BM Units would require modification to the provisions governing the definition and registration of BM Units in section K3 of the BSC. Such a modification would not appear to Ofgem/DTI to be necessary or expedient for the implementation of BETTA and therefore would represent an inappropriate use of the BETTA power.
5	British Energy	BC1 Appendix 1 – Data for the Cascade Hydro Schemes should be submitted in respect of PNs, Quiescent PNs (as defined in the Grid Code) ("QPN"), Maximum Export Limits (as defined in the Grid Code) ("MEL"), Maximum Import Limit (as defined in the Grid Code) ("MIL"), bids and offers under the BSC, Dynamic Parameters at generating unit level but BMRS reporting will take place at BM Unit level.	Bids and offers will be on a BM Unit basis. The additional generating unit information (PNs, QPNs, MEL/MIL) will be used to ensure the GB transmission system remains stable and secure.
6	British Energy	BC1.4.2 – Day Ahead Submissions British Energy asked, in relation to sub paragraph (a) – PNs to be submitted for generating units, how will PNs for BM Units be derived? British Energy asked how will consistency between Generation Capacity (as defined in the BSC) and Demand Capacity (as defined in the BSC) at BM Unit level and PNs at generating unit level be achieved as it is not covered by the data consistency rules? They also noted that they considered it	PNs for BM Units will be submitted as for any other BM Unit and the text has been updated to clarify this obligation (BC1.4.2 (a) and BC1.4.5 have been amended accordingly). However, as the generating unit specific data is solely for use by NGC in meeting its obligations to maintain system security and stability, it will not be passed on to the BSC systems or to other market participants. Demand Capacity is not relevant for the Cascade Hydro Schemes. The rules for consistency of PNs against Generation Capacity are currently being reviewed by

No.	Respondent	Comment	Ofgem/DTI View
		unlikely that MEL/MIL for any of the Cascade Hydro Schemes will equal the summation of the MELs/MILs for each generating unit as registrant will wish to retain flexibility. Consistency between the dynamics of the generating units and the BM Unit will be impossible to confirm given the number of possible combinations. Other BM Units accept this uncertainty.	NGC. NGC software allows for an equivalent Generation Capacity to be used for each generating unit, which can be used to check PNs at the time of submission. MELs/MILs will be submitted at generating unit and BM Unit level. NGC will only be able to despatch within the generating unit limits. Bid-Offer Pairs (as defined in the BSC) will be accepted at BM Unit level and it will be the registrants responsibility to ensure that those MELs/MILs are not exceeded. Dynamic Parameter data is only submitted on a BM Unit basis.
7	British Energy	BC1.4.2 (c) suggests MELs and MILs are submitted both on a BM Unit and a generating unit basis. The text suggests that the MEL/MIL for an individual generating unit are the maximum levels that the participant in the balancing mechanism 'wishes to make available'. However for any of the Cascade Hydro Schemes with bids and offers at a BM Unit level, the participant in the balancing mechanism is only making MEL/MIL for the BM Unit 'available'. The MEL/MIL for the generating units are effectively a description of the maximum levels the participant may choose to run individual generating units in order to deliver its PN or any bids or offers.	The generating unit level MEL/MIL data is for information to NGC but should be consistent at any time with the Cascade Hydro Scheme BM Unit data. As stated in relation to the previous comment, it is the responsibility of the Cascade Hydro Scheme BM Unit registrant to ensure that MELs/MILs are not exceeded. The BC1 Appendix 1 data is for information and it will be the responsibility of the registrant to ensure that it is consistent with BM Unit data. BOAs will be assessed on BM Unit data but NGC must be aware of the activities of individual generating units within the Cascade Hydro Schemes at any time for system security and stability reasons.
8	British Energy	BC1.4.2 (d) and (e) indicate Bid-Offer Data and Dynamic Parameters are at BM Unit level, not generating unit level. This is inconsistent with BC1 Appendix 1. The special references to the Cascade Hydro Schemes in (d) and (e) are probably unnecessary but could be considered to add clarity by avoiding doubt. The BM Unit will be treated like any other BM Unit in respect of this information, subject to NGC's knowledge of the 'special dynamics' implied in Other Relevant Data (as defined under the Grid Code).	Ofgem/DTI do not consider that BC1.4.2(d) and (e) are inconsistent with BC1 Appendix 1 which is conditional as it states 'where data is submitted on a Generating Unit basis' etc.

No.	Respondent	Comment	Ofgem/DTI View
9	British Energy	BC1.4.3 - Data Revisions British Energy asked as to the revisions of data relating to generating units in the Cascade Hydro Schemes. They expressed surprise that NGC do not require revisions to the data in respect of individual units of any of the Cascade Hydro Schemes. Later reference in BC1.4.5 to checking of revisions implies revisions are expected.	Ofgem/DTI accept the comment and the text in BC1.4.3 now includes references to data relating to generating units which form part of the Cascade Hydro Schemes.
10	British Energy	BC1.4.5 - BM Unit Data Defaulting, Validity and Consistency Checking The phrase 'BM Unit or in the case of a Cascade Hydro Scheme, the data in respect of the Generating Units forming part of its BM Unit' suggests that checking will only be done in respect of the individual generating unit data and not the BM Unit as a whole. This could lead to inconsistency between the component generating unit data and the 'aggregate' BM Unit data, and in the BM Unit data itself. It is generally not clear how the checking for individual generating units will be performed, given that the data defaulting, consistency, validity and consistency checking document makes no reference to generating units or their parameters. Grid Code sections relating to bid-offer acceptance make no special reference to Cascade Hydro Schemes, but there is an implicit requirement that the PN/MEL/MIL and other Dynamic Parameters of the combined BM Unit are consistent with the values for the individual generating units. The final sentence in BC1.4.5 is that 'In the event of a difference between the BM Unit Data for the Cascade Hydro Scheme and the sum of the data submitted for the Generating Units forming part of such Cascade Hydro Scheme, the BM Unit Data shall take precedence.' It is unclear what is meant by 'sum of the data', and when it would apply. BM Unit data is	BOAs will be assessed, accepted and compensated on a BM Unit basis. Generating unit specific data to be submitted by the registrant of Cascade Hydro Scheme BM Units is necessary information for NGC when discharging its obligations in relation to transmission system security and stability purposes only, and it is therefore unclear as to why this should be made available as part of BM reporting. It is understood that both the BM Unit data and generating unit data will be subject to checks on submission. In the event of an inconsistency between aggregated generating unit data and BM Unit data then the BM Unit data will take precedence. Ofgem/DTI would expect communication between NGC and the generator should any inconsistency arise to remove such inconsistency.

No.	Respondent	Comment	Ofgem/DTI View
		not a simple summation of individual generating unit data. There is an implication that data will be submitted at BM Unit level as well as at generating unit level, but this does not appear to be explicitly stated anywhere.	
11	British Energy	BC1 - Appendix 1 It is proposed to include at the start of the appendix the statement that 'For the purposes of a Cascade Hydro Scheme, where data is submitted on a Generating Unit basis, the provisions of this Appendix 1 shall in respect of such data submission apply as if references to BM Unit were replaced with Generating Unit.' This is inconsistent with the main text, where bid-offer data and dynamic data at a generating unit level are explicitly prohibited (BC1.4.2d/e).	The text in BC1.4.2 contains the obligation to send the data, the appendix contains the form of the data. The qualification added at the beginning of BC1 Appendix 1 in respect of the Cascade Hydro Schemes only applies "where data is submitted on a Generating Unit basis" i.e. to the extent required in the text, hence the statement at the start of Appendix 1 to BC1 is consistent with the obligations in the main body of BC1.
12	British Energy	BC 1.A.1.7 - Cascade Hydro Scheme Matrix It is doubtful that the interaction between the operation of individual generating units will be as straightforward as suggested by the table of offer size against number of units synchronised.	NGC considered that, in light of the relative size of the generating units concerned, the critical information from the perspective of safety in terms of fault levels was the number of units synchronised. This approach is also consistent with the CCGT module matrix. Ofgem/DTI note that NGC will have the right to ask for more detailed information, which if not forthcoming and in the view of the system operator would have an impact on the operation of the system, the system operator would not issue a BOA. Should changes be required to the Cascade Hydro Scheme matrix then they may be proposed through the appropriate change management arrangements.
13	British Energy	BC2.A.1.3 - The BOAs relating to CCGT Modules (as defined in the Grid Code) will assume that the CCGT generating units within the CCGT Module will operate in accordance with the CCGT Module Matrix, as required by BC1. The BOAs relating to the Cascade Hydro Schemes will assume that the generating units forming part of the Cascade Hydro Schemes will operate, where submitted, in accordance with the Cascade Hydro	This assumption reflects current practice in Scotland. Should further arrangements be required then they can be proposed through the appropriate change management arrangements.

No.	Respondent	Comment	Ofgem/DTI View
		Scheme matrix submitted under BC1.' British Energy considered this to be a bold assumption.	
14	Edisson Mission Energy ("EME")	EME continue to believe that it is entirely appropriate for individual hydro stations to participate in the balancing mechanism without the need for special treatment. The BSC was designed to be robust to the full range of physical characteristics of generation and supply, in order to level the playing field for all parties. For example, pumped storage is a unique technology with unique physical constraints (e.g. there is a common water source for a number of units, and any generation needs to be offset at some point with an appropriate volume of pumping energy.) First Hydro is required manage these constraints commercially, without any special treatment in the BSC.	Ofgem/DTI are of the view that the BSC only requires parties to manage constraints commercially to the extent that one or more generating units satisfy the criteria that define a BM Unit set down in section K. These criteria allow explicitly for the aggregation of generating units into a single BM Unit where there are particular interdependencies between those generating units. To the extent that any BSC party has the right to request the registration of such a BM Unit configuration and that such requests will be considered against published criteria, registrants can only be treated as specialised to the extent that is permitted by the provisions of the BSC. Ofgem/DTI consider that suggesting equivalence between pumped storage and the Cascade Hydro Schemes is inappropriate. The generating units in pumped storage are set out in parallel whereas the Cascade Hydro Schemes have their generating units in series. The operational interdependencies between the generating units within the Cascade Hydro Schemes, particularly taking into account the environmental statutory obligations which apply, would appear to place significant operational constraints on the individual generating units within each scheme. In light of these operational constraints and the size of the Cascade Hydro Schemes, Ofgem/DTI consider that it is appropriate for the Cascade Hydro Schemes to be registered as single BM Units.
15	EME	EME noted that Ofgem agrees with its view that the risks can be managed commercially. If an offer is accepted at one station any excess water can be used for generation downstream. This can be achieved without breaching any Grid Code obligations by submitting a final PN ("FPN") on the relevant unit prior to the next available gate closure.	Ofgem/DTI's statement in the July mini-consultation related to the risks associated with compliance with statutory environmental obligations; whether or not generating units are configured into BM Units will have no bearing on SSE's role in the management of water levels within each cascade. However, Ofgem/DTI also stated that these statutory environmental obligations

No.	Respondent	Comment	Ofgem/DTI View
		Where the transit time between reservoirs is too short to allow an FPN to be submitted for the next gate closure then presumably water can by-pass the turbines and be spilled to the next level. This avoids any breach of the Grid Code as the station is not generating in excess of its PN. If these physical alternatives are genuinely not practical, then it is clear that the constituent parts of the cascade scheme do not have the dynamics to participate in the balancing mechanism. This is no different to other kinds of participants (for example nuclear stations, the majority of the demand side) who are unable to participate in the balancing mechanism because they cannot change output in short timescales. It seems unreasonable to make changes to Codes are required to specifically allow hydro stations with short water transit times to participate in the balancing market.	influence the way in which the schemes are operated as a single cascade. The purpose of these proposed non standard BM Unit configurations is to facilitate compliance with statutory environmental obligations rather than to allow hydro stations with short water transit times to participate in the balancing mechanism. The associated Grid Code changes are intended to ensure that NGC has sufficient data to help maintain system security and stability. Ofgem/DTI consider that they convey no appreciable competitive advantage on the registrant of these BM Units. To the extent that these generating units can be configured, in accordance with section K of the BSC, into BM Units that reflect the way in which they were designed to be operated thereby facilitating compliance with statutory environmental obligations then it would seem reasonable to do so.
16	EME	BC2 - Unlike other generators, individual generating units in a cascade scheme will be able to deviate from FPNs (if this is to comply with statutory water management obligations). It should in any case be possible to predict any need to vary water levels (perhaps due to heavy rain) and modify future FPNs to manage water flows. Even if the problem is more immediate, water can simply by-pass the turbine and be spilled. If output needs to be reduced within gate closure timescales, the MEL on the unit can be reduced. Other generators have constraints placed on their operation for example through the IPPC (Integrated Pollution Prevention and Control European Community directive) which limits minute by minute NOx and SOx emissions. Output has to be managed to avoid breaching these environmental constraints.	Ofgem/DTI are not convinced that constraints imposed by the IPPC are comparable to those which apply to the Cascade Hydro Schemes. The IPPC limits on NOx and SOx emissions should be capable of being completely within the control of the station operator at a generating unit level. To suggest that water flow, a factor influenced heavily by the weather, within a cascade is of equivalent manageability does not seem appropriate to Ofgem/DTI. As set out above, Ofgem/DTI acknowledge that the Cascade Hydro Schemes are capable of being operated in accordance with statutory environmental obligations in the absence of non standard BM Unit configurations, however it is clear from the drafting of section K of the BSC that such BM Unit configurations are within scope.

No.	Respondent	Comment	Ofgem/DTI View
17	EME	Why, if generating unit level FPNs are being made available to NGC, are they not to be made available to all to improve transparency. This would also apply to the Cascade Hydro Scheme matrix.	In light of the operational interdependencies between generating units, Ofgem/DTI have drawn equivalence with the treatment of CCGT Modules in establishing BMRS reporting requirements for the Cascade Hydro Scheme BM Units. BOAs will be assessed and compensated against BM Unit data and that data will be made available to the market. This is consistent with the treatment of other BM Units.
18	E.ON	Cascade Hydro Scheme – Definition The definition appears clear, although it relies upon naming the relevant schemes. There is no size criteria given, and so it is unclear (apart from naming the sites) which cascade hydro schemes fall within the definition, and which are not caught by it. Since there are existing schemes other than those named by SSE, this could be confusing in the future. In BC1 Appendix 1, a sentence has been added to paragraph one explaining that for the Cascade Hydro Schemes, for BM Unit, read generating unit. This aids the flow of the text considerably, and such a statement could be used to the benefit of drafting elsewhere, for example BC1.4.5, BC2.5.1, and many others. Alternatively, such a statement could be made in the definition of "Cascade Hydro Scheme".	The amendments to Codes which are to be made as part of this consultation are restricted by the vires of the BETTA power, that is to say those which are necessary or expedient for the implementation of BETTA. To this extent, the proposed changes reflect the need to address a particular issue that arises out of the application of the BSC on a GB basis, on this occasion the invitation for requests for non standard BM Unit configurations and the need for a decision in respect of such requests in the absence of a GB BSC Panel. This conclusions document constitutes the end of this particular process rather than the consideration of issues associated with the handling of cascade hydro generation in general. Operators of other such schemes are free to request a non standard BM Unit configuration if they see fit. To the extent that such BM Unit configurations are not registered then the Grid Code Cascade Hydro Scheme provisions would not apply, and therefore there should not be any confusion. Ofgem/DTI note the suggestion to aid the flow of text in the proposed changes to the Grid Code drafting. Ofgem/DTI consider that the text in its current form is fit for purpose. The qualification added at the beginning of BC1 Appendix 1 in respect of the Cascade Hydro Schemes only applies “where data is submitted on a Generating Unit basis” i.e. to the extent required in the text. It may be possible to implement the proposed suggestion, but Ofgem/DTI are of the view that it would require a substantial review and

No.	Respondent	Comment	Ofgem/DTI View
			restructuring of the proposed text but would not result in significant additional clarity. Ofgem/DTI are therefore content for the text to remain in its current form.
19	E.ON	Submission of Forecast Data for Each Genset Gensets of less than 5 MW in the North of Scotland are not required to make forecast submissions to NGC, so it would therefore seem anomalous to require generating units of less than 5 MW within the Cascade Hydro Schemes to make such submissions.	Ofgem/DTI are aware of only one generating unit of the proposed BM Unit configurations below 5 MW. Given the grouping of this generating unit in one of the Cascade Hydro Schemes, it would seem likely to Ofgem/DTI that its exclusion from the requirement to submit generating unit specific data is unlikely to significantly reduce the burden of administrating this particular scheme and that the requesting party is content with the proposed arrangements, Ofgem/DTI are not minded to change the proposed obligations.
20	E.ON	Details of plant to be used in the delivery of accepted bids and offers E.ON noted that whenever MELs for each generating unit are updated under BC2.5.3.3, it is arguable that the matrix referred to in BC1.A.1.7.1 will have to be amended.	Noted although Ofgem/DTI do not consider that such a relationship needs to be explicitly covered in the relevant provisions. Updates could be requested and provided through ad hoc communications. There is a clear incentive upon NGC to check consistency of this data in light of its obligations as GB system operator.
21	E.ON	Mandatory service instruction and provision at generating unit level The whole of BC3 is predicated on instructions being issued to BM Units, not generating units. E.ON considered that since E.ON have no information on the electrical connection of the individual generating units, it is difficult to comment upon the implicit assertion that voltage must be controlled down to such a specific location. However, since frequency response is national in nature, it is unnecessary to make provision for the instruction of frequency response by generating unit. Given that each of the Cascade Hydro Schemes is a single BM Unit, NGC should not be able to BOA an individual generating unit, in order to bring it to a load where it is possible to instruct frequency response. If the level of detail control is required, then the each generating unit should be registered as a separate BM Unit. It is one thing to have	NGC will not be able to BOA an individual generating unit. BOAs will be assessed, actioned and compensated at BM Unit level. Ofgem/DTI consider that NGC needs the ability to despatch ancillary services on a generating unit basis in order to be in a position to satisfy its security standard and quality of service obligations. Due to the radial nature of the 132kV system and the fact that the generating units may be within different constraint zones, NGC needs to have the facility to despatch mandatory services at a generating unit level. CCGT modules do not have multi-locational connections to the transmission system and therefore the arrangements for instruction of mandatory services from CCGT modules are not considered by Ofgem/DTI to be an appropriate model for the Cascade Hydro Schemes. Ofgem/DTI note that reactive power needs tend to be locational and cannot necessarily be met by an instruction on a Cascade Hydro Scheme BM Unit basis

No.	Respondent	Comment	Ofgem/DTI View
		an awareness of what the generating units within a BM Unit are doing, it is quite another to have this level of control. E.ON were unable to support the instruction of mandatory services on a generating unit level. This is not required for CCGTs – E.ON questioned what is different for the Cascade Hydro Schemes.	as one of the generating units within the scheme may provide the desired effect whereas others may have an undesirable effect. Ofgem/DTI acknowledge that frequency response services can generally be considered effective over a wide geographic area but note that the despatch of a frequency response service requires NGC to take account of the availability of the relevant sections of the transmission network (connecting the generating unit to the main transmission system). Ofgem/DTI are satisfied that frequency response instructions to units within a Cascade Hydro Scheme BM Unit need to be issued on a generating unit basis. Where the output of a particular unit was required to change in order to provide an ancillary service, NGC would discuss this with the generator and only issue such an instruction if guaranteed of the required effect from the specified generating unit. Both NGC and the requesting party are content with the proposed arrangements. To this extent it is unclear why the instruction of mandatory ancillary services at generating unit level should be a source of concern to other market participants.
22	E.ON	Application of Emergency Instructions at generating unit Level In BC2.9, there is no statement explicitly permitting CCGTs to be instructed as units. However, there is a clear statement covering that point under BC2.9.3.2(d), and we believe it would be appropriate for there to be an equivalent example under BC2.9.3.2, rather than the statement given in the drafting at BC2.9.1.5.	Ofgem/DTI agree with the comment and the text has been revised to include a new BC2.9.3.2(f) and to delete BC2.9.1.5.
23	ScottishPower Energy Management (SPEM)	SPEM supported the accommodation of the Cascade Hydro Schemes within the industry codes for BETTA but was concerned that the definition of "Cascade Hydro Scheme" includes references to specific existing schemes, thus apparently precluding the future registration of other	Ofgem/DTI note that the future registration of non standard BM Unit configurations associated with other cascade hydro schemes is not precluded. Rather such registrations will be subject to the requirement to make formal requests, as was the case in respect of this mini-consultation, and approval in

No.	Respondent	Comment	Ofgem/DTI View
		similar schemes. SPEM expressed the view that the definition should be generic, with reference to a schedule of those schemes which meet the definition at a given date, if this detail is required. The proposed definition should be modified by deleting all the text from "known as" to "6.Beauly".	accordance with Section K of the BSC. Ofgem/DTI also note the amendments to Codes which are to be made as part of this consultation are restricted by the vires of the BETTA power, that is to say those which are necessary or expedient for the implementation of BETTA. To this extent, the proposed changes reflect the need to address a particular issue that arose out of the application of the BSC on a GB basis, on this occasion the invitation for requests for non standard BM Unit configurations and the need for a decision in respect of such requests in the absence of a GB BSC Panel. This conclusions document constitutes the end of this particular process rather than the consideration of issues associated with the handling of cascade hydro generation in general. BSC Parties have had the right to propose modifications to the version of the BSC to apply under BETTA from the 1 September 2004 and such proposals will be considered in accordance with the BSC objectives rather than the more narrow vires of the BETTA power.
24	SPEM	There is a reference in BC2.5.1 to "Statutory Water Management Obligations" which appears with initial capitals but not in bold text. There does not appear to be a definition of this term included in the proposed drafting.	Ofgem/DTI note that defined terms in the Grid Code are capitalised and placed in bold. Ofgem/DTI note that many terms appear in the Grid Code that are capitalised but not in bold or defined and consider that the drafting is in line with the remainder of the Grid Code.
25	SPEM	There are incorrect paragraph references in OC5.1 and PC A3.1.3(a).	Ofgem/DTI accept the comment in respect of PC A3.1.3(a) and the reference has been changed. Ofgem/DTI were unable to find an error in the references in OC5.1.
26	National Grid Transco ("NGT")	NGT confirmed the view that the drafting as contained in the appendix to the open letter is sufficient to address the concerns that had previously highlighted in their response to the ELEXON consultation. Given these changes NGT confirmed that they were comfortable with proposals in the ELEXON consultation in respect of the requests for non standard BM Units related to the Cascade Hydro Schemes.	Noted

Appendix 2 – Proposed draft legal text for GB BSC

Ofgem/DTI propose that the GB BSC is amended as follows:

Amend Table A as follows:

ANNEX I-2: TABLES

Table A Non-standard BM Unit Configurations

Applicant	BM Unit Name	Site	Summary of Dispensation Application	Commencement Date
Grangemouth CHP Limited	Unnamed at publication	BP Grangemouth	CHP Generation, with the CHP Generator's production being regarded as an Export to the Total System.	BETTA Effective Date
Grangemouth CHP Limited	Unnamed at publication	BP Grangemouth	Exempt supplies of electricity from the CHP Generation to the local site demand, with that supply being regarded as an Import from the Total System.	BETTA Effective Date
Grangemouth CHP Limited	Unnamed at publication	BP Grangemouth	Any licensed supplies necessary to satisfy the balance of demand on the site which is not covered by on-site generation, as Imports from the Total System.	BETTA Effective Date
Scottish and Southern Energy plc	Beauly	Deanie Culligran Aigas Kilmorack	To allow the hydro generating units at the sites to be associated with a BM Unit and to allow the generators within the BM Unit to be operated in a cascade mode i.e. where the common energy source, the water, is used through the generating units as it makes its way from the high level catchment areas to sea level.	BETTA Effective Date

Scottish and Southern Energy plc	Clunie	Clunie Pitlochry	To allow the hydro generating units at the sites to be associated with a BM Unit and to allow the generators within the BM Unit to be operated in a cascade mode i.e. where the common energy source, the water, is used through the generating units as it makes its way from the high level catchment areas to sea level.	BETTA Effective Date
Scottish and Southern Energy plc	Killin	Lubreoch Cashlie Lochay	To allow the hydro generating units at the sites to be associated with a BM Unit and to allow the generators within the BM Unit to be operated in a cascade mode i.e. where the common energy source, the water, is used through the generating units as it makes its way from the high level catchment areas to sea level.	BETTA Effective Date
Scottish and Southern Energy plc	Moriston	Ceannacroc Livishie Glenmoriston	To allow the hydro generating units at the sites to be associated with a BM Unit and to allow the generators within the BM Unit to be operated in a cascade mode i.e. where the common energy source, the water, is used through the generating units as it makes its way from the high level catchment areas to sea level.	BETTA Effective Date
Scottish and Southern Energy plc	Conon	Mossford Luichart Orrin Torr Achilty	To allow the hydro generating units at the sites to be associated with a BM Unit and to allow the generators within the BM Unit to be operated in a cascade mode i.e. where the common energy source, the water, is used through the generating units as it makes its way from the high level catchment areas to sea level.	BETTA Effective Date

Scottish and Southern Energy plc	Garry	Quoich Invergarry	To allow the hydro generating units at the sites to be associated with a BM Unit and to allow the generators within the BM Unit to be operated in a cascade mode i.e. where the common energy source, the water, is used through the generating units as it makes its way from the high level catchment areas to sea level.	BETTA Effective Date

Appendix 3 – Proposed draft legal text for GB Grid Code

Ofgem/DTI propose that GB Grid Code is amended as follows:

SEE APPENDED DRAFT TEXT