INDICATIVE DRAFTING RELATING TO CAP169

SCHEDULE 2 - EXHIBIT 4

DATED [ ] 200[ ]

NATIONAL GRID ELECTRICTY TRANSMISSION COMPANY PLC (1)

and

[ ] (2)

THE CONNECTION AND USE OF SYSTEM CODE

MANDATORY SERVICES AGREEMENT

RELATING TO [ ] POWER STATION

THIS **MANDATORY SERVICES AGREEMENT** is made on the [ ] day of [ ] 200[ ]

BETWEEN

(1) **National Grid Electricity Transmission plc** a company registered in England with number 2366977 whose registered office is at 1-3 Strand, London, WC2N 5EH ("**The Company**", which expression shall include its successors and/or permitted assigns); and

(2) [ ] a company registered in [ ] with number [ ] whose registered office is at [ ] ("**User**", which expression shall include its successors and/or permitted assigns)

WHEREAS

(A) Pursuant to the **Transmission Licence**, **The Company** is required to prepare a Connection and Use of System Code **(CUSC)** setting out the terms of the arrangements for connection to and use of the **GB Transmission System** and the provision of certain **Balancing Services**.

(B) As at the date hereof, **The Company** and the **User** are parties to the **CUSC Framework Agreement** (being an agreement by which the **CUSC** is made contractually binding between the parties).

(C) This **Mandatory Services Agreement** is entered into pursuant to the terms of the **CUSC** and shall be read as being governed by it and, as between **The Company** and the **User**, has priority over the terms of the **CUSC** in accordance with (and subject to) Paragraph 11.2.2 of the **CUSC**.

NOW IT IS HEREBY AGREED as follows:

1. DEFINITIONS, INTERPRETATION AND CONSTRUCTION

Unless the subject matter or context otherwise requires or is inconsistent therewith, terms and expressions defined in Section 11 of the **CUSC** have the same meanings, interpretations or constructions in this **Mandatory Services Agreement**. Subject thereto, unless the subject matter or context otherwise requires or is inconsistent therewith, in this **Mandatory Services Agreement** the terms set out in Appendix 3 shall have the meanings set out respectively therein.

2. COMMENCEMENT

This **Mandatory Services Agreement** shall commence on [ ] ("**Commencement Date**").

3. OBLIGATORY REACTIVE POWER SERVICE - DEFAULT UTILISATION

3.1 Schedule 3, Part I to the CUSC

The provisions of this Clause 3 implement the terms of Paragraph 2 of Schedule 3, Part I to the **CUSC** ("**CUSC Schedule**") with respect to the payments to be made by **The Company** to the **User** for the provision by the **User** from the **BM Units** of the **Obligatory Reactive Power Service**, and in accordance with Paragraph 2.1 thereof the **Parties** hereby agree to make all necessary amendments to this **Mandatory Services Agreement** so as to give effect to the provisions of the **CUSC Schedule** as amended or modified from time to time.

3.2 Term and Suspension

[3.2.1 The provisions of this Clause 3 shall be deemed to have applied in relation to each **BM Unit** with effect from 00.00 hours on the [date hereof] [**Commencement Date**] and, subject always to Sub-Clause 3.2.2, shall continue thereafter unless and until the earlier of termination of the **CUSC Schedule** and termination of this **Mandatory Services Agreement**. For the avoidance of doubt, in the event this **Mandatory Services Agreement** is terminated in relation to any individual **BM Unit**, the provisions of this Clause 3 shall terminate in relation to that **BM Unit** only.] *OR*

[3.2.1 The provisions of Sub-Clauses 3.3 to 3.6 inclusive shall apply with effect from 00.00 hours on the date on which it is demonstrated (having regard to industry practice) to the reasonable satisfaction of **The Company** that each of the [**CCGT**] [**BM**] [**Non-Synchronous Generating**] **Units** complies with the provisions of **Grid Code CC** 6.3.2 and 6.3.4 as applicable (or the coming into force of a direction issued by the **Authority** relieving the **User** of the obligation under its **Licence** to comply therewith) or (where **The Company** in its sole discretion requires **Reactive Power** from the **BM Units** before then for the purposes of security of the **GB Transmission System**) such earlier date as **The Company** may agree with the **User** and, subject always to Sub-Clause 3.2.3, shall continue thereafter unless and until the earlier of termination of the **CUSC Schedule** and termination of this **Mandatory Services Agreement**. For the avoidance of doubt, the issue by **The Company** in relation to the **BM Unit** of a **Reactive Despatch Instruction** to unity power factor or zero Mvar shall not imply demonstration to **The Company's** reasonable satisfaction of compliance as referred to above nor imply in relation to the **BM Unit** agreement by **The Company** of an earlier date as referred to herein.

3.2.2 No demonstration referred to in Sub-Clause 3.2.1 shall take place until the **User** shall have demonstrated to **The Company's** reasonable satisfaction (having regard to industry practice) that [each [**CCGT**] [**BM**] **Unit's Excitation System**, and in particular (where applicable) the **Under-excitation Limiter**.] [the continuously-acting automatic control system required to provide control of the voltage or zero transfer of **Reactive Power** with respect to each [**Power Park Module**][**DC Converter**]] has been successfully commissioned and complies with the provisions of **Grid Code CC** 6.3.8.]

3.2.2/3 In relation to any **BM Unit**, the provisions of this Clause 3 (except this Sub-Clause 3.2) shall be suspended and have no force and effect upon the coming into effect, and for the duration of, any agreement (referred to in the **CUSC Schedule** as a "**Market Agreement**" and being either a new **Ancillary Services Agreement** or an agreement incorporating provisions into this **Mandatory Services Agreement**) which may be entered into between the Parties pursuant to Paragraph 3 of the **CUSC Schedule** for the provision by the **User** in relation to that **BM Unit** of:-

(a) the **Obligatory Reactive Power Service** but with alternative payment arrangements to those provided in this Clause 3; or

(b) an **Enhanced Reactive Power Service**.

For the avoidance of doubt, with effect from the expiry or termination of any **Market Agreement** such provisions shall in relation to that **BM Unit** cease to be suspended and shall resume full force and effect.

3.2.3/4 Termination or suspension of this Clause 3 shall not affect the rights and obligations of the **Parties** accrued as at the date of termination or suspension.

3.3 Capability Data

3.3.1 The **Parties** agree that, for the purposes of the Appendices to the **CUSC Schedule**:-

[(a) the figures set out in Table B of Appendix 1, Section A, Part I represent for each **BM Unit** the **Reactive Power** capability at **Rated MW** which the **User** is obliged to provide under and in accordance with ~~the **Connection Conditions** of the~~ **Grid Code CC** 6.3.2(a), together with **Reactive Power** capability at other levels of MW **Output** as specified therein by reference to the **Generator Performance Chart** submitted in accordance with

Grid Code OC 2.4.2 and measured at the generator stator terminals; and

(b) the figures set out in Table A of Appendix 1, Section A, Part I shall constitute for each of the **BM Units** the value of QC_{lead} and QC_{lag} referred to in Section 2 of Appendix 3 to the **CUSC Schedule** representing the **Reactive Power** capability at **Rated MW** shown at the **Commercial Boundary** (by application of the formulae set out in Appendix ~~8~~8, Part 1 to the **CUSC Schedule**).] *OR*

[(a) the figures set out in Table B of Appendix 1, Section A, Part I represent for each relevant **CCGT Unit** the **Reactive Power** capability at **Rated MW** which the **User** is obliged to provide under and in accordance with ~~the **Connection Conditions** of the~~ **Grid Code CC** 6.3.2(a), together with **Reactive Power** capability at other levels of MW **Output** as specified therein by reference to the **Generator Performance Chart** submitted in accordance with **Grid Code OC** 2.4.2 and measured at the generator stator terminals; and

(b) the figures set out in summary Table C of Appendix 1, Section A, Part I represent for the **BM Unit** the **Reactive Power** capability of each relevant **CCGT Unit** at **Rated MW** (derived from Table B) but shown at the high voltage side of the **Generating Unit** step-up transformer by application of the ~~formula~~formulae set out in Appendix 8, Part 2 to the **CUSC Schedule**; and

(c) the figures set out in Table A of Appendix 1, Section A, Part I shall constitute for the **BM Unit** the value of QC_{lead} and QC_{lag} referred to in Section 2 of Appendix 3 to the **CUSC Schedule** representing the **Reactive Power** capability of the **BM Unit** at **Rated MW** shown at the **Commercial Boundary** (derived by the summation of the **Reactive Power** capability of each relevant **CCGT Unit** at **Rated MW** extracted from summary Table C and by application of the formulae set out in Appendix 8 , Part 2 to the **CUSC Schedule**.]

[(a) the figures set out in Table B of Appendix 1, Section A, Part I represent for the **BM Unit** the **Reactive Power** capability at **Rated MW** and at various other **Active Power** output levels which the **User** is obliged to provide under and in accordance **Grid Code CC** 6.3.2(c) or 6.3.2(d)(i) (as the case may be) by reference to the **Generator Performance Chart** submitted in accordance with **Grid Code OC** 2.4.2 and measured at either the **Grid Entry Point** in England and Wales or at the HV side of the 33/132 kV or 33/275 kV or 33/400 kV transformer for

Users connected to the **GB Transmission System** in Scotland or the **User System Entry Point** if **Embedded**; and

(b) the figures set out in Table A of Appendix 1, Section A, Part I shall constitute for the **BM Unit** the value of QC_{lead} and QC_{lag} referred to in Section 2 of Appendix 3 to the **CUSC Schedule** representing the **Reactive Power** capability at **Rated MW** shown at the **Commercial Boundary**.

[(a) the figures set out in Table B of Appendix 1, Section A, Part I represent for each relevant **Non-Synchronous Generating Unit** the **Reactive Power** capability at **Rated MW** which the **User** is obliged to provide under and in accordance with **Grid Code CC** 6.3.2(d)(ii), together with **Reactive Power** capability at other levels of MW **Output** as specified therein by reference to the **Generator Performance Chart** submitted in accordance with **Grid Code OC** 2.4.2 and measured at the generator stator terminals; and

(b) where applicable, the figures set out in summary Table C of Appendix 1, Section A, Part I represent for a **Power Park Module** the **Reactive Power** capability of each relevant **Power Park Unit** at **Rated MW** (derived from Table B) but shown at the high voltage side of the **Generating Unit** step-up transformer by application of the formulae set out in Appendix 8, Part 3 to the **CUSC Schedule**; and

(c) the figures set out in Table A of Appendix 1, Section A, Part I shall constitute for the **BM Unit** the value of QC_{lead} and QC_{lag} referred to in Section 2 of Appendix 3 to the **CUSC Schedule** representing the **Reactive Power** capability of the **BM Unit** at **Rated MW** shown at the **Commercial Boundary** (where applicable, derived by the summation of the **Reactive Power** capability of each relevant **Power Park Unit** at **Rated MW** extracted from summary Table C and by application either of the formulae set out in Appendix 8, Part 3 to the **CUSC Schedule** or such other methodology as **The Company** and the **User** may agree in writing.]

3.4 Payments to User

3.4.1 In respect of each **BM Unit**, and in consideration of the **User** providing the **Obligatory Reactive Power Service** from that **BM Unit**, **The Company** shall pay to the **User** in respect of each calendar month in accordance with Paragraph 4.3 of the **CUSC** the aggregate total payments calculated in accordance with Appendix 1 to the **CUSC Schedule** and referred to therein as "PT".

3.4.2 For the purposes of Sub-Clause 3.4.1:-

(a) the **Relevant Zone** in which the **BM Units** are situated is specified in Appendix 1, Section A, Part I;

(b) without prejudice to Paragraph 4.1.2.2 of the **CUSC**, **The Company** shall use the meters and aggregation principles specified and/or referred to in Appendix 1, Section A, Part II to ascertain the amount of **Leading** and **Lagging** Mvarh produced in each **Settlement Period** by the **BM Units**, and such amount of **Leading** or **Lagging** Mvarh shall constitute the respective values of U_{lead} and U_{lag} as referred to in paragraph 1 of Appendix 3 to the **CUSC Schedule**; and

(c) the **Parties** acknowledge that all meters and metered data used for the purposes of this Clause 3 shall comply with the provisions of Appendix 4 to the **CUSC Schedule**.

4. FREQUENCY RESPONSE

4.1 Paragraph 4.1.3 of CUSC

The provisions of this Clause 4 give effect to the provisions of Paragraph 4.1.3 of the **CUSC** in respect of the provision by the **User** from the **BM Units** of the **Mandatory Ancillary Service** of **Frequency Response** and the payments to be made by **The Company** to the **User** in respect thereof.

4.2 Term

4.2.1 The provisions of this Clause 4 shall be deemed to have applied in relation to each **BM Unit** with effect from 00.00 hours on the [date hereof] [**Commencement Date**] and shall continue thereafter unless and until this **Mandatory Services Agreement** is terminated. For the avoidance of doubt, in the event this **Mandatory Services Agreement** is terminated in relation to any individual **BM Unit**, the provisions of this Clause 4 shall terminate in relation to that **BM Unit** only.

4.2.2 Termination of this Clause 4 shall not affect the rights and obligations of **The Company** and the **User** accrued as at the date of termination.

4.3 Provision of Frequency Response

4.3.1 The **Parties** agree that:-

(a) [subject always to Sub-Clause 4.4,] for the purposes of Paragraph 4.1.3.7 of the **CUSC**, the figures set out in the response tables in Appendix 1, Section B, Part I represent the amount of **Primary Response**, **Secondary Response** and **High Frequency Response** referred to therein;

(b) [subject always to Sub-Clause 4.4] for the purposes of Paragraph 4.1.3.9 of the **CUSC**, the figures set out in the summary response table in Appendix 1, Section B, Part II represent the capabilities in respect of **Primary Response**, **Secondary Response** and **High Frequency Response** at given levels of **De-Load** referred to therein;

(c) for the purposes of Paragraph 4.1.3.4 of the **CUSC**, the table in Appendix 1, Section B, Part III shows the permissible combinations of **Primary Response**, **Secondary Response** and **High Frequency Response** referred to therein;

(d) for the purposes of Paragraph 4.1.3.9 of the **CUSC**, the figures (if any) set out in the plant configuration table in Appendix 1, Section B, Part II represent the plant configuration adjustment factors referred to therein to be applied where the **BM Unit** is a **CCGT Module**;

(e) [subject always to Sub-Clause 4.4,] for the purposes of Paragraph 4.1.3.9A(a) of the **CUSC** in respect of calculation of the **Response Energy Payment**, the response values in Appendix 1, Section B, Part IV represent the **Frequency Response Power** that is deemed to be delivered in respect of **Primary Response**, **Secondary Response** and **High Frequency Response**.

4.4 [Commissioning and Provisional Response Levels

Without prejudice to Paragraph 4.1.3.14 of the **CUSC**, the **User** acknowledges that the levels of **Response** set out in the response tables in Appendix 1, Section B, Parts I, II and IV are indicative figures only during the period in which the relevant **Generating Unit(s)** is being commissioned and the **User** hereby undertakes to use its reasonable endeavours to forward to **The Company** levels of **Response** which represent the true operating characteristics of such **Generating Unit(s)** for inclusion in Appendix 1, Section B, Parts I, II and IV as soon as possible following completion of commissioning.]

5. RESTRICTIVE TRADE PRACTICES ACT

Any restriction or information provision (each of those terms having the same meaning in this Clause 5 as in the Restrictive Trade Practices Act 1976) contained in this **Mandatory Services Agreement** shall cease to have effect:-

(i) if a copy of this **Mandatory Services Agreement** is not provided to the Department of Trade and Industry ("**DTI**") within 28 days of the date on which this **Mandatory Services Agreement** is made; or

(ii) if, within 28 days of the provision of that copy to the **DTI**, the **DTI** gives notice of objection to the **Party** providing it.

6. GENERAL PROVISIONS

Paragraphs 6.12 (limitation of liability), 6.14 (transfer and subcontracting), 6.15 (confidentiality), 6.18 (intellectual property), 6.19 (force majeure), 6.20 (waiver), 6.21 (notices), 6.22 (third party rights), 6.23 (jurisdiction), 6.24 (counterparts), 6.25 (governing law), 6.26 (severance of terms) and 6.27 (language*)* and Section 7 *(*dispute resolution) of the **CUSC** are incorporated into this **Mandatory Services Agreement** *mutatis mutandis*.

7. VARIATIONS

7.1 Subject to Sub-Clause 7.2, no variation to this **Mandatory Services Agreement** shall be effective unless made in writing and signed by or on behalf of both **The Company** and the **User**.

7.2 **The Company** and the **User** shall effect any amendment required to be made to this **Mandatory Services Agreement** by the **Authority** as a result of a change in the **CUSC** or the **Transmission Licence,** an order or direction made pursuant to the **Act** or a **Licence**, or as a result of settling any of the terms hereof. The **User** hereby authorises and instructs **The Company** to make any such amendment on its behalf and undertakes not to withdraw, qualify or revoke such authority or instruction at any time.

8. NOTICES

For the purposes of this **Mandatory Services Agreement**, unless and until otherwise notified by the relevant **Party** to the other in accordance with Paragraph 6.21.1 of the **CUSC**, any notice or other communication to be given by **The Company** or the **User** to the other under, or in connection with matters contemplated by, this **Mandatory Services Agreement** shall be sent to the following address and/or facsimile number and marked for the attention of the person named below:

The Company: Address:

Facsimile number:

For the attention of:

User: Address:

Facsimile number:

For the attention of:

9. BANK ACCOUNT DETAILS

For the purposes of Paragraph 4.3.2.18 of the **CUSC**, unless and until otherwise notified by the relevant **Party** to the other in accordance with that Paragraph, details of each of the **Party**'s bank accounts to which sums payable in connection with this **Mandatory Services Agreement** shall be paid are set out below:

The Company:	Bank:
	Branch:
	Account Number:
User:	Bank:
	Branch:
	Account Number:

IN WITNESS WHEREOF the hands of the duly authorised representatives of the parties hereto at the date first above written

SIGNED BY)
[name])
for and on behalf of)
NATIONAL GRID ELECTRICITY TRANSMISSION PLC)

SIGNED BY)
[name])
for and on behalf of)
[User])

APPENDIX 1 – DATA
SECTION A (REACTIVE POWER)

Part I

Capability Tables (Relevant Zone [ ])

[TABLES BELOW FOR USE WHERE GRID CODE CC6.3.2(a) APPLICABLE (EXCEPT FOR CCGT MODULES)]

BM Unit No.

REACTIVE POWER CAPABILITY AT COMMERCIAL BOUNDARY (at rated stator terminal and nominal system voltage)

TABLE A	LEAD (Mvar)	LAG (Mvar)
AT RATED MW		

REACTIVE POWER CAPABILITY AT GENERATOR STATOR TERMINAL (at rated terminal voltage)

TABLE B	MW	LEAD (Mvar)	LAG (Mvar)
AT RATED MW			
AT FULL OUTPUT (MW)			
AT MINIMUM OUTPUT (MW)			

BM Unit No.

REACTIVE POWER CAPABILITY AT COMMERCIAL BOUNDARY (at rated stator terminal and nominal system voltage)

TABLE A	LEAD (Mvar)	LAG (Mvar)
AT RATED MW		

REACTIVE POWER CAPABILITY AT GENERATOR STATOR TERMINAL (at rated terminal voltage)

TABLE B	MW	LEAD (Mvar)	LAG (Mvar)
AT RATED MW			
AT FULL OUTPUT (MW)			
AT MINIMUM OUTPUT (MW)			

BM Unit No.

REACTIVE POWER CAPABILITY AT COMMERCIAL BOUNDARY (at rated stator terminal and nominal system voltage)

TABLE A	LEAD (Mvar)	LAG (Mvar)
AT RATED MW		

REACTIVE POWER CAPABILITY AT GENERATOR STATOR TERMINAL (at rated terminal voltage)

TABLE B	MW	LEAD (Mvar)	LAG (Mvar)
AT RATED MW			
AT FULL OUTPUT (MW)			
AT MINIMUM OUTPUT (MW)			

BM Unit No.

REACTIVE POWER CAPABILITY AT COMMERCIAL BOUNDARY (at rated stator terminal and nominal system voltage)

TABLE A	LEAD (Mvar)	LAG (Mvar)
AT RATED MW		

REACTIVE POWER CAPABILITY AT GENERATOR STATOR TERMINAL (at rated terminal voltage)

TABLE B	MW	LEAD (Mvar)	LAG (Mvar)
AT RATED MW			
AT FULL OUTPUT (MW)			
AT MINIMUM OUTPUT (MW)			

OR

[TABLES BELOW FOR USE WHERE GRID CODE CC6.3.2(a) APPLICABLE - CCGT MODULES ONLY]

REACTIVE POWER CAPABILITY AT COMMERCIAL BOUNDARY (at rated stator terminal and nominal system voltage)

TABLE A	MW	LEAD (Mvar)	LAG (Mvar)
AT RATED MW			

REACTIVE POWER CAPABILITY AT GENERATOR STATOR TERMINAL (at rated terminal voltage)

CCGT Unit No. [ ]

TABLE B	MW	LEAD (Mvar)	LAG (Mvar)
AT RATED MW			
AT FULL OUTPUT (MW)			
AT MINIMUM OUTPUT (MW)			

CCGT Unit No. [ ]

TABLE B	MW	LEAD (Mvar)	LAG (Mvar)
AT RATED MW			
AT FULL OUTPUT (MW)			
AT MINIMUM OUTPUT (MW)			

CCGT Unit No. [ ]

TABLE B	MW	LEAD (Mvar)	LAG (Mvar)
AT RATED MW			
AT FULL OUTPUT (MW)			
AT MINIMUM OUTPUT (MW)			

REACTIVE POWER CAPABILITY AT HV SIDE OF STEP-UP TRANSFORMER (at rated terminal and nominal system voltage)

SUMMARY TABLE C	RATED MW	LEAD (Mvar)	LAG (Mvar)
CCGT UNIT			

]

OR

[TABLES BELOW FOR USE WHERE GRID CODE CC6.3.2(c) or (d)(i) APPLICABLE]

REACTIVE POWER CAPABILITY AT COMMERCIAL BOUNDARY (at rated stator terminal and nominal system voltage)

BM Unit No.___

TABLE A	**MW**	**LEAD (Mvar)**	**LAG (Mvar)**
AT RATED MW			

REACTIVE POWER CAPABILITY AT GRID ENTRY POINT (ENGLAND AND WALES) OR HV SIDE OF RELEVANT TRANSFORMER (SCOTLAND) OR USER SYSTEM ENTRY POINT (IF EMBEDDED)

BM Unit No.___

TABLE B	**MW**	**LEAD (Mvar)**	**LAG (Mvar)**
AT RATED MW			
AT 50% OF RATED MW			
AT 20% OF RATED MW			
AT BELOW 20% OF RATED MW			
AT 0% OF RATED MW			

OR

[TABLES BELOW FOR USE WHERE GRID CODE CC6.3.2(d)(ii) APPLICABLE (INCLUDING FOR POWER PARK UNITS)]

REACTIVE POWER CAPABILITY AT COMMERCIAL BOUNDARY (at rated stator terminal and nominal system voltage)

TABLE A	**MW**	**LEAD (Mvar)**	**LAG (Mvar)**
AT RATED MW			

REACTIVE POWER CAPABILITY AT NON-SYNCHRONOUS GENERATING UNIT STATOR TERMINAL (at rated terminal voltage)

Non Synchronous Generating Unit (including Power Park Unit): Each

TABLE B	MW	LEAD (Mvar)	LAG (Mvar)
AT RATED MW			
AT FULL OUTPUT (MW)			
AT MINIMUM OUTPUT (MW)			

REACTIVE POWER CAPABILITY AT HV SIDE OF STEP-UP TRANSFORMER (at rated terminal and nominal system voltage)

SUMMARY TABLE C	RATED MW	LEAD (Mvar)	LAG (Mvar)
POWER PARK UNIT			

[NOTE: SUMMARY TABLE C ONLY APPLICABLE TO POWER PARK MODULES]

Part II

Meters and Aggregation Principles

[BM Unit No.]

[BM] *or* *[CCGT]* Unit No	Meter Identification No.	Meter Location Code	Loss Adjustment Factor	Outstation ID	Channel No.	Meter Type

Aggregation Methodology

[N/A]

or

[Category A/B/C/D aggregation principles as set out in the latest published version of the document entitled "Methodology Document for the Aggregation of Reactive Power Metering" shall apply]*

** Delete as applicable*

Part III

Calculation of Reactive Power Capability at the Commercial Boundary

For the purposes of Appendix 8 to the **CUSC Schedule**, the following table shows the reactive load applicable to each of the relevant **BM Units**, constituting the respective value Q_{ts} referred to therein:-

Reactive Load	
BM Unit	**Q_{ts}**

APPENDIX 1 – DATA (Cont.)
SECTION B (FREQUENCY RESPONSE)

Part I - Frequency Response Data

Station:

BM Unit Nos.

Table 1	Low Frequency Response – Mode A						
Genset De-Load (MW)	δf_p (Hz)	Primary Response (MW)	Secondary Response (MW)				
			δf_s= - 0.1Hz	δf_s= - 0.2Hz	δf_s= - 0.3Hz	δf_s= - 0.4Hz	δf_s= - 0.5Hz
	-0.1						
	-0.2						
	-0.3						
	-0.4						
	-0.5						
	-0.6						
	-0.7						
	-0.8						
	-0.1						
	-0.2						
	-0.3						
	-0.4						
	-0.5						
	-0.6						
	-0.7						
	-0.8						
	-0.1						
	-0.2						
	-0.3						
	-0.4						
	-0.5						
	-0.6						
	-0.7						
	-0.8						
	-0.1						
	-0.2						
	-0.3						
	-0.4						
	-0.5						
	-0.6						
	-0.7						
	-0.8						
	-0.1						
	-0.2						
	-0.3						
	-0.4						
	-0.5						
	-0.6						
	-0.7						
	-0.8						
	-0.1						
	-0.2						
	-0.3						

	-0.4						
	-0.5						
	-0.6						
	-0.7						
	-0.8						

Station:
BM Unit Nos:

Table 2	High Frequency Response (MW) - Mode A				
Genset De-Load (MW)	Frequency Deviation from Target Frequency				
	δf_h = +0.1 Hz	δf_h = +0.2 Hz	δf_h = +0.3 Hz	δf_h = +0.4 Hz	δf_h = +0.5 Hz

[In relation to the levels of **Response** capability pursuant to Paragraph 4.1.3 of **CUSC** and Table 2 above it is agreed that for low operating outputs, the **High Frequency Response** capability will be limited such that the generation level will under normal operating conditions not be caused to drop below [ ] MW.]

For the purpose of Paragraph 4.1.3.11(a) of the **CUSC** the level of **Response** capability for a **Frequency Deviation** of 0.0 Hz shall be 0.0 MW.

Part II

Frequency Response Summary Data

Station:
BM Unit Nos:

Table 1	Frequency Response Capability Summary - Mode A		
Genset De-Load (MW)	Primary Response @-0.5Hz (MW)	Secondary Response @-0.2Hz (MW)	High Frequency Response @+0.5Hz (MW)
	P_{MW}	S_{MW}	H_{MW}

Table 2	Plant Configuration Adjustment Factor K_{GRC} – Mode A
1 Gas Turbine and 1 Steam Turbine	
1 Gas Turbine	

(or whatever configuration is appropriate)

Part III

Frequency Response - Permissible Combinations

Station:
BM Unit Nos:

Table 1	**Mode A Response**	
Primary Response	✓	✓
Secondary ~~Secondary~~ Response		✓
High Frequency Response	✓	✓

Part IV

Frequency Response Power Delivery Data

Station:
BM Unit Nos:

Primary Response Power Delivery – Mode A						
Frequency Deviation (Hz)	Genset De-load (MW)					
-0.1						
-0.2						
-0.3						
-0.4						
-0.5						

Primary & Secondary Response Power Delivery – Mode A						
Frequency Deviation (Hz)	Genset De-load (MW)					
-0.1						
-0.2						
-0.3						
-0.4						
-0.5						

High Frequency Response Power Delivery – Mode A						
Frequency Deviation (Hz)	Genset De-load (MW)					
+0.1						
+0.2						
+0.3						
+0.4						
+0.5						

The figures for genset deload in the tables shall be taken from the figures for genset deload shown in the tables Frequency Response Capability Data tables in Part I.

APPENDIX 2 - PRICES

SECTION A (REACTIVE POWER)

Not Used

APPENDIX 2

SECTION B (FREQUENCY RESPONSE)

Not Used

APPENDIX 3 – FURTHER DEFINITIONS

"BM Units"	***[identify]***
[**"Commercial Boundary"**	for a **BM Unit** comprising a **Power Park Module** or **DC Convertor**, the **Grid Entry Point** in England and Wales or the HV side of the 33/132 kV or 33/275 kV or 33/400 kV transformer for **Users** connected to the **GB Transmission** System in Scotland or the **User System Entry Point** if **Embedded**;]
"Frequency Sensitive Mode"	a **Genset** operating mode which will result in the **Active Power** output changing, in response to a change in **System Frequency**, in a direction which assists in the recovery to **Target Frequency** by operating so as to provide **Primary Response** and/or **Secondary Response** and/or **High Frequency Response**;
"Full Output"	the meaning attributed to it in **Grid Code BC** 2.A.3.1;
"Generator Performance Chart"	a diagram which shows the MW and Mvar capability limits within which a **BM Unit** will be expected to operate under steady state conditions;
"Grid Entry Point"	the meaning attributed to it in the **Grid Code**;
"Minimum Output"	the meaning attributed to it in **Grid Code BC** 2.A.3.1;
"Mode A"	in relation to **Primary**, **Secondary** and/or **High Frequency Response** means the levels of **Response** set out in relation thereto in Table 1 and/or (as applicable) Table 2 of Appendix 1, Section B, Part I;

"Parties"	the parties to this **Mandatory Services Agreement**;
"Reactive Power Zone" **"Relevant Zone"** **"Under-excitation Limiter"**	means those separate areas of England and Wales identified as zones in the Seven Year Statement for 1997 for the purposes of specifying local **Reactive Power** capability and need; the **Reactive Power Zone** in which the **BM Units** are situated, which for convenience only shall be specified in Appendix 1, Section A, Part I; the meaning attributed to it in the **Grid Code**;
δf_h	a **Frequency Deviation** from **Target Frequency** which is achieved 10 seconds from the time of the **Frequency** change and is sustained thereafter;
δf_p	a **Frequency Deviation** from **Target Frequency** which is achieved 10 seconds from the time of the **Frequency** change and is sustained for a further 20 seconds;
δf_s	a **Frequency Deviation** from **Target Frequency** which is achieved 30 seconds from the time of the **Frequency** change and is sustained for a further 30 minutes.

Document comparison done by Workshare Professional on 24 February 2009 15:33:01

Input:	
Document 1	file://C:/CUSC Exhibit 4.doc
Document 2	file://C:/CUSC Exhibit 4 - 80701v2.doc
Rendering set	standard

Legend:	
Insertion	
~~Deletion~~	
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Style change	
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Inserted cell	
Deleted cell	
Moved cell	
Split/Merged cell	
Padding cell	

Statistics:	
	Count
Insertions	77
Deletions	10
Moved from	0
Moved to	0
Style change	0
Format changed	0
Total changes	87