WORKING GROUP REPORT VOLUME 2

For Working Group Consultation Only

CUSC Amendment Proposal CAP169

Provision of Reactive Power from Power Park Modules, Large Power Stations and Embedded Power Stations

Prepared by the CAP169 Working Group

for submission to the Amendment Panel

Amendment Ref	CAP169
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Prepared by	National Grid

PART A – PROPOSED LEGAL TEXT TO MODIFY THE CUSC - Text to give effect to the Original Proposed Amendment

Please note this legal text is draft for the purposes of the Working Group Consultation and has not been fully agreed by the Working Group.

For information the text required to give effect to each part of the proposal is outlined below:

- Part 1: Section 1, Section 4, Section 11, Schedule 2 and Schedule 3
- Part 2: Schedule 3 (2.8ii and Appendix 6, 1.2)
- Part 3: Section 11 (definitions for Network Operator, Reactive Despatch Network Restriction and Pre-Connection Reactive Despatch Network Restriction) and Schedule 3 (Appendix 1, 2e and Appendix 2, 2e)

The majority of changes are associated with part 1 of the proposal, apart from those explicitly detailed above for parts 2 and 3.

The following pages show the proposed marked up changes for the following sections of the CUSC:

1. **Section 1**
2. **Section 4**
3. **Section 11**
4. **Schedule 2**
5. **Schedule 3**

Changes are marked as outlined in the table below:

Legend:	
Insertion	
~~Deletion~~	
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INDICATIVE DRAFTING RELATING TO CAP169

CUSC - SECTION 1

APPLICABILITY OF SECTIONS AND RELATED AGREEMENTS STRUCTURE

CONTENTS

CUSC - SECTION 1

APPLICABILITY OF SECTIONS AND RELATED AGREEMENTS STRUCTURE

1.1 INTRODUCTION

1.1.1 The **CUSC** is divided into different sections, including sections dealing specifically with **Connection** to and **Use of System**, the provision of **Balancing Services**, **Interconnectors** and other sections of more general application.

1.1.2 Compliance with the various sections by a **User** is dependent on the nature of that **User's** connection and/or use in any given instance. A **User** may be party to the **CUSC** in a number of different categories.

1.1.3 This Section also deals with the requirement for a **User** to enter into **Bilateral Agreements**, **Construction Agreements** and **Mandatory Services Agreements**.

1.1.4 The **CUSC** and the proforma **Bilateral Agreements** set out as Exhibits 1, 2 and 5 of Schedule 2 are drafted to reflect the standard terms in relation to **The Company's** charges (an indicative price agreement). Where a **User** chooses to have a different charging option, where provided for in the **Charging Statements** current at the time of application for the relevant **Bilateral Agreement**, that **Bilateral Agreement** will provide for the specific terms relating to the charging option and for the relevant paragraphs of Section 2 to apply (or be disapplied) subject to those specific terms. This may lead to the areas covered by the relevant **Bilateral Agreement** being wider in certain circumstances.

1.2 APPLICABILITY

1.2.1 Each **User** is required to comply with the various Sections of the **CUSC** as provided for in this Section 1. Each Section may contain further detail in relation to particular categories of connection and/or use.

1.2.2 The different categories of connection and/or use reflect the types of utilisation which can exist. For example a **User** could have a directly connected **Power Station** and also be acting as a **Supplier**. In that case that **User** will need to comply in relation to two categories of connection and/or use, and its obligations in relation to each will differ.

1.2.3 Section 1, Sections 5 to 8 and 11 of the **CUSC** apply to all categories of connection and/or use, and therefore should be

complied with by all **Users**, subject as specifically provided in those Sections. Section 4 of the **CUSC** applies to **Users** who provide **Balancing Services** to **The Company**, and contains its own provisions on applicability to such **Users**.

1.2.4 In relation to Sections 2, 3 and 9 the following table sets out the applicability of those Sections in addition to those Sections referred to in Paragraph 1.2.3:

	Categories	**Applicable Sections**
1.	**Power Station** directly connected to the **GB Transmission System**	2 and 3
2.	**Non-Embedded Customer Site**	2 only
3.	**Distribution System** directly connected to the **GB Transmission System**	2 only
4.	**Suppliers**	3 only
5.	**Embedded Power Station** except those which are the subject of a **BELLA**	3 only
6.	**Small Power Station Trading Parties**	3 only
7.	**Interconnector User**	9 Part II only
8.	**Interconnector Error Administrator**	9 Part II only
9.	**Interconnector Owner**	9 Part I only
10.	**Distribution Interconnector Owner**	3 Only
11.	**Embedded Exemptable Large Power Stations** whose **Boundary Point Metering System** is either **SMRS** registered or is registered in **CMRS** by a **User** who is responsible for the **Use of System Charges** associated with the **BM Unit** registered in **CMRS**	None

1.2.5

Users, when making a **Connection Application** or **Use of System Application** (in each case in the form of the relevant exhibit), should identify the category for which they are applying.

1.2.6 Each **Bilateral Agreement**, **Use of System Supply Confirmation Notice** or **Use of System Interconnector Confirmation Notice**, will set out the category of connection and/or use to which it relates.

1.2.7 Where a Paragraph states a category of connection and/or use, or type of **User**, to which that Paragraph (or part of that Paragraph) applies, the application of that Paragraph (or part of Paragraph) shall be limited to the **User** in relation to that category of connection and/or use, or type of **User**, described.

1.2.8 Where a Paragraph does not state a category of connection and/or use, or type of **User**, to which that Paragraph (or some part of that Paragraph) applies, that Paragraph (or part of the Paragraph) shall apply to all types of **Users** and categories of connection and/or use.

1.2.9 Where a Paragraph is stated "as between **The Company** and that **User**", rights and obligations under that Paragraph shall arise only between **The Company** and each **User** individually to whom that Paragraph applies. Accordingly, no **User** shall enjoy any rights nor incur any obligations against any other **User** pursuant to the terms of any such Paragraph.

1.2.10 Notwithstanding any other provision of this **Code**, where a **User** owns or operates an **Exemptable Embedded Large Power Station** which is **Embedded** in part of a **Distribution System** or the **System** of any other **User** where and to the extent that such part of the system in which the **Exemptable Embedded Large Power Station** is **Embedded** is not directly or indirectly connected to the **GB Transmission System**, that **User** need not comply with paragraphs 1.3, 1.5, 6.3.6 and 6.3.7 in respect of that **Exemptable Embedded Large Power Station**.

1.3 BILATERAL AGREEMENTS, CONSTRUCTION AGREEMENTS AND MANDATORY SERVICES AGREEMENTS

1.3.1 Bilateral Agreements

(a) Each **User** in respect of each category of connection and/or use with a direct connection to the **GB Transmission System** shall enter into and comply with a **Bilateral Connection Agreement** in relation to such connection and/or use as identified in Paragraph 1.3.1(d).

(b) Each **User** in respect of each category of connection and/or use with an **Embedded Power Station** (except those which are the subject of a **BELLA**) and/or in relation to a **Small Power Station Trading Party** and/or a **Distribution Interconnector** shall enter into and comply with a **Bilateral Embedded Generation Agreement** in relation to such use as identified in Paragraph 1.3.1(d).

(c) Each **User** in respect of its **Embedded Exemptable Large Power Station** whose **Boundary Point Metering System** is registered in **SMRS** or is registered in **CMRS** by another **User** who is responsible for the **Use of System Charges** associated with the **BM Unit** registered in **CMRS** shall enter into and comply with a **BELLA** as identified in Paragraph 1.3.1(d).

(d) Exhibits 1, 2 and 5 in Schedule 2 to the **CUSC** contain the forms of **Bilateral Agreements** contemplated to be entered into pursuant to this Paragraph 1.3, being:

(i) Exhibit 1 – **Bilateral Connection Agreement**: direct connection to the **GB Transmission System** (**Power Station** directly connected to the **GB Transmission System**, **Distribution System** directly connected to the **GB Transmission System**, **Non-Embedded Customer Site** and/or **Interconnector**);

(ii) Exhibit 2 – **Bilateral Embedded Generation Agreement**: embedded use of system (**Embedded Power Station** (except those which are the subject of a **BELLA**) and/or in relation to a **Small Power Station Trading Party** and/or **Distribution Interconnector**);

(iii) Exhibit 5 – **BELLA**: provisions associated with such **Embedded Exemptable Large Power Stations** who have no rights and obligations under Section 3 of the **CUSC**.

1.3.2 Construction Agreements

Each **User** who wishes to construct or modify a direct connection to the **GB Transmission System** or commence or modify use by his **Embedded Power Station** or **Distribution Interconnector**, or any **Distributor** who wishes to connect a **Relevant Embedded Medium Power Station** or **Relevant Embedded Small Power Station** to his system shall enter into and comply with a **Construction Agreement** in respect of any construction works required as a result of that connection or **Modification**, together with a **Bilateral Agreement** as identified in Paragraph 1.3.1 or, as appropriate, an agreement to vary such **Bilateral Agreement**.

1.3.3 Mandatory Services Agreements

(a) **The Company** and each **User** if a **Generator** shall, as between **The Company** and that **User**, in respect of the

Generating Units, **DC Converters** and **Power Park Modules** from which that **User** is required to provide the **Mandatory Ancillary Services** in accordance with the **Grid Code**, enter into and comply with a **Mandatory Services Agreement** where applicable in accordance with Paragraph 1.3.3(b) in a form to be agreed between **The Company** and that **User** but based substantially on the form set out in Exhibit 4 in Schedule 2 (with necessary changes to enable the operation of those provisions, and those in Section 4 and Schedule 3 where the **Generating Units**, **DC Converters** or **Power Park Modules** (as the case may be) are not registered as **BM Unit(s)**).

(b) Each **User** and **The Company** shall, as between **The Company** and that **User**, not later than 6 months (or such lesser time as may be agreed) prior to the expected **Commissioning Programme Commencement Date**, have entered into a **Mandatory Services Agreement** providing for payment for **Mandatory Ancillary Services** to be supplied by the **User** to **The Company**. In the event of a **Mandatory Services Agreement** not having been entered into by the said date, either party shall be entitled to initiate the procedure for resolution of the issue as an **Other Dispute** in accordance with Paragraph 7.4 to settle the terms of the said **Mandatory Services Agreement**. **The Company** shall not **Energise** the **User's Equipment** or in the case of an **Embedded Power Station** issue an **Operational Notification** until the said **Mandatory Services Agreement** shall have been entered into by both parties.

1.3.4 General Provisions

(a) **Bilateral Agreements** and **Construction Agreements** which are entered into between **The Company** and **Users** shall be in or substantially in the relevant exhibited form of **Bilateral Agreement** and/or **Construction Agreement** unless the parties thereto agree otherwise.

(b) Each and every **Bilateral Agreement**, **Mandatory Services Agreement** and **Construction Agreement** entered into by a **User** and in force from time to time shall constitute a separate agreement governed by the terms of the **CUSC** and will be read and construed accordingly. For the avoidance of doubt no **User** shall enjoy any rights nor incur any obligations against any other **User** pursuant to the terms of any **Bilateral**

Agreement, **Mandatory Services Agreement** or **Construction Agreement**.

1.4 CATEGORIES OF USE WITHOUT BILATERAL AGREEMENTS

1.4.1 Three categories of use of the **GB Transmission System** do not require a **Bilateral Agreement** to be entered into as all the relevant provisions are included in the **CUSC** itself. These relate to **Suppliers**, **Interconnector Users** and **Interconnector Error Administrators** who in those categories of connection and/or use have no physical presence on the system. Further provisions on this are contained in Section 3 and Section 9 Part II.

1.5 BELLA APPLICATION

1.5.1 A **User** in respect of its **Embedded Exemptable Large Power Station** whose **Boundary Point Metering System** is registered in **SMRS** (or who intends to so register) or in **CMRS** by a **User** who is responsible for the **Use of System Charges** associated with the **BM Unit** registered in **CMRS** (or who intends to so register), shall complete and submit to **The Company** a **BELLA Application** and comply with the terms thereof.

1.5.2 **The Company** shall make a **BELLA Offer** to that **User** as soon as practicable after receipt of the **BELLA Application** and (save where the **Authority** consents to a longer period) in any event not more than 3 months after receipt by **The Company** of the effective **BELLA Application**. The **BELLA Offer** shall be in the form of a **BELLA**.

1.5.3 The **BELLA Offer** shall remain open for acceptance for 3 months from its receipt by that **User** unless either that **User** or **The Company** makes an application to the **Authority** under Paragraph 1.6 of the **CUSC**, in which event the **BELLA Offer** shall remain open for acceptance until 14 days after any determination by the **Authority** pursuant to such application.

1.5.4 Upon acceptance of the **BELLA Offer** (as offered by **The Company** or determined by the **Authority**) by the **User** and execution by **The Company**, the **User's** rights and obligations pursuant thereto shall commence in accordance with its terms. Such rights and obligations shall continue until the **BELLA** is terminated.

1.5.5 A **User** who is required by this Paragraph 1.5 to submit a **BELLA Application** shall not energise or operate its **Embedded Exemptable Large Power Station** until it has entered into a **BELLA** with **The Company** and until **The Company** has issued the **User** with an **Operational Notification** in accordance with the terms of the **BELLA**.

1.6 AUTHORITY'S RIGHT TO DETERMINE IN RESPECT OF A BELLA

1.6.1 If, after a period which appears to the **Authority** to be reasonable for the purpose, **The Company** or the **User** have failed to enter into a **BELLA** in respect of the **Embedded Exemptable Large Power Station** either **The Company** or the **User** may apply to the **Authority** for the **Authority** to settle any terms of the **BELLA Offer** in dispute.

1.6.2 Upon such application, the **Authority**, pursuant to section 7 (3) (c) of the **Act**, may settle any terms in dispute between **The Company** and the **User** in respect of such **BELLA** in such manner as appears to the **Authority** to be reasonable having (in so far as relevant) regard in particular to the following considerations:

(a) that the performance by **The Company** of its obligations under the **BELLA** should not cause it to be in breach of those provisions referred to at paragraph 5 of Standard Condition C8 of the **Transmission Licence**;

(b) that any methods by which **The Company's** transmission system is connected to any other **System** for the transmission or distribution of electricity accord (insofar as applicable to **The Company**) with the **Grid Code**, the **STC** and the **Distribution Code**;

(c) that the terms and conditions of the **BELLA** so settled by the **Authority** and of any other agreements entered into by **The Company** pursuant to Paragraph 1.5 should be in as similar a form as is practicable.

1.6.3 Where the **Authority** settles any terms in dispute, the **User** and **The Company** shall forthwith enter into the **BELLA** as settled.

1.6.4 If either the **User** or **The Company** proposes to vary the terms of the **BELLA** in a manner provided for under such agreement, the **Authority** may, at the request of **The Company** or the **User**, settle any dispute relating to such variation in such manner as appears to the **Authority** to be reasonable.

END OF SECTION 1

INDICATIVE DRAFTING RELATING TO CAP169

CUSC - SECTION 4

BALANCING SERVICES

CONTENTS

CUSC - SECTION 4

BALANCING SERVICES

4.1 MANDATORY ANCILLARY SERVICES

4.1.1 Application

4.1.1.1 The provisions of this Paragraph 4.1 shall apply to **Users** which are **Generators** in respect of **Generating Units**, **DC Converters** and **Power Park Modules** from which they are required to provide the **Mandatory Ancillary Services** to **The Company** in accordance with the **Grid Code** (for the avoidance of doubt, as determined by any direction in force from time to time and issued by the **Authority** relieving any such **User** from the obligation under its **Licence** to comply with such part or parts of the **Grid Code** or any **Distribution Code** or, in the case of **The Company**, the **Transmission Licence**, as may be specified in such direction).

4.1.1.2 In respect of **Generating Unit(s)**, **DC Converter(s)** and **Power Park Module(s)** which are required to provide **Mandatory Ancillary Services** to **The Company** in accordance with the **Grid Code** and which are not registered as **BM Unit(s)**, the **Mandatory Service Agreement** shall detail how the provisions of Section 4 and Schedule 3 of the **CUSC** which refer to **BM Unit(s)** shall (notwithstanding such **Generating Unit(s)**, **DC Converter(s)** and **Power Park Module(s)** are not registered as **BM Unit(s)**) apply.

4.1.2 Reactive Power

Schedule 3, Part I

4.1.2.1 **The Company** and each **User** shall, as between **The Company** and that **User**, comply with the provisions regarding the **Obligatory Reactive Power Service** and any **Enhanced Reactive Power Service** contained in Schedule 3, Part I.

*Provision of **Obligatory Reactive Power Service***

4.1.2.2 Subject as herein provided, each **User** hereby agrees, as between **The Company** and that **User**, to provide the **Obligatory Reactive Power Service** from each of the **BM Units** specified in a **Mandatory Services Agreement**.

Redeclarations

4.1.2.3 (a) For the avoidance of doubt, nothing in this Paragraph 4.1.2.3 or any **Mandatory Services Agreement** shall affect the provisions of **Grid Code OC** 2 and/or **BC** 1 concerning the redeclaration in relation to any **BM Unit** (or where applicable, any **CCGT Unit** or **Power Park Unit**) of a revised capability to provide **Leading** and/or **Lagging** Mvar, where applicable at the generator stator terminals.

(b) All such redeclarations at the generator stator terminals submitted pursuant ~~thereto~~to **Grid Code OC** 2 and/or **BC** 1 may include the revised capability (in the case of **CCGT Units** and **Power Park Units**, of the relevant **BM Unit**) at **Rated MW** at the **Commercial Boundary**. Such capability shall be derived from the capability at the generator stator terminals by application of the ~~formula~~applicable formulae set out in ~~Part 1~~Parts 1, 2 or 3 of Appendix 8 to Schedule 3, Part I ~~or, in the case of a **CCGT Module**, derived by the summation of the revised capability of each relevant **CCGT Unit** at the high voltage side of the **CCGT Unit** step up transformer (after application of the formula set out in Section 1 of Part 2 of Appendix 8 to Schedule 3, Part I to the capability of each relevant **CCGT Unit** at the generator stator terminals and by application of the formula set out in Section 2 of Part 2 of Appendix 8 to Schedule 3, Part I)~~.

~~(b)~~ (c) Where a redeclaration of capability to provide **Leading** and/or **Lagging** Mvars at **Rated MW** does not specify such revised capability at the **Commercial Boundary**, then **The Company** shall calculate the revised capability at **Rated MW** at the **Commercial Boundary** by application of the ~~relevant formula~~applicable formulae set out in ~~Part 1~~Parts 1, 2 or ~~2 (as the case may be)~~3 of Appendix 8 ~~of~~to Schedule 3, Part I.

(~~c~~d) Any revised capability of a **BM Unit** at **Rated MW** at the **Commercial Boundary** shall constitute the respective values of QR_{lead} and QR_{lag} as referred to in Section 2 of Appendix 3 of Schedule 3, Part I.

(~~d~~e) In order to calculate any payments which fall due in accordance with this Paragraph 4.1.2 and a **Mandatory Services Agreement**, following commencement of the relevant clause of the **Mandatory Services Agreement**, **The Company** shall calculate the values of QR_{lead} and QR_{lag} in accordance with the applicable formulae contained in Parts 1, 2 or 3 of Appendix 8 ~~of~~to Schedule 3, Part I.

Utilisation

4.1.2.4 **The Company** shall have the right (but shall not be obliged) at any time to instruct a **User** by the issue of a **Reactive Despatch Instruction** to provide **Leading** and/or **Lagging** Mvars from some or all of the **BM Units** specified in a **Mandatory Services Agreement**.

Monitoring

4.1.2.5 In order to comply with its obligations contained in **Grid Code OC** 5, **The Company** may use its **Operational Metering Equipment,** or **Operational Metering Equipment** owned by a **Relevant Transmission Licensee** in accordance with Paragraph 6.7.3 to ensure that, in respect of each **BM Unit**, a **User** is complying with its obligations to provide the **Obligatory Reactive Power Service** both in accordance with the **Grid Code** and in accordance with the terms of the **Mandatory Services Agreement**.

4.1.2.6 Each **User** acknowledges that **The Company** may wish to install additional monitoring equipment at a **Power Station** to monitor the ability of any or all of the **BM Units** of that **User** to provide the **Obligatory Reactive Power Service**, such monitoring equipment to be installed on terms to be agreed with that **User** (such agreement not to be unreasonably withheld or delayed). The cost of such additional monitoring equipment and its installation shall be borne by **The Company**.

Reactive Testing

4.1.2.7 Where, in accordance with **Grid Code OC** 5.4.2.4, **The Company** shall be entitled to require a **Reactive Test**, such test shall be in addition to, and shall not prejudice **The Company 's** right to require, the two annual **Reactive Tests** referred to in **Grid Code OC** 5.5.1.1. If a **BM Unit** or a **CCGT Unit** (as the case may be) fails a **Reactive Test**, then **The Company** shall advise the **User** that the **BM Unit** or **CCGT Unit** (as appropriate) has so failed whereupon,

subject always to resolution of any dispute in accordance with **Grid Code OC** 5.5.4 and (where applicable) **OC** 5.5.5, the **User** shall immediately advise **The Company** of the revised capability of that **BM Unit** or **CCGT Unit** (as appropriate) to provide **Leading** and/or **Lagging** Mvars (as the case may be) in accordance with the terms of the **Mandatory Services Agreement**.

Grid Code

4.1.2.8 It is acknowledged by **The Company** and each **User** that the provision by that **User** of the **Obligatory Reactive Power Service** in accordance with the terms of the **CUSC** and the **Mandatory Services Agreement** shall not relieve it of any of its obligations set out in the **Grid Code** including without limitation its obligation set out in **Grid Code CC** 8.1 to provide **Reactive Power** (supplied otherwise than by means of synchronous or static compensators except in the case of a **Power Park Module** where synchronous or static compensation within the **Power Park Module** may be used to provide **Reactive Power**) in accordance with **Grid Code CC** 6.3.2.

Disclosure and Use of Information

4.1.2.9 Each **User** hereby consents to the disclosure and use by **The Company** of data and other information relating to the provision by that **User** of the **Obligatory Reactive Power Service** and the relevant provisions of the **Mandatory Services Agreement** relating thereto to the extent necessary to enable **The Company** to comply with its obligations set out in the **CUSC**.

Hierarchy

4.1.2.10 If any provision of the **Mandatory Services Agreement** to the extent relating to the **Obligatory Reactive Power Service** shall be inconsistent with the provisions of Schedule 3, Part I, the provisions of Schedule 3, Part I shall prevail to the extent of such inconsistency.

4.1.3 Frequency Response

Introduction

4.1.3.1 Each applicable **User** is obliged to provide (for the avoidance of doubt, as determined by any direction in force from time to time and issued by the **Authority** relieving that **User** from the obligation under its **Licence** to comply with such part or parts of the **Grid Code** or any **Distribution**

Code or, in the case of **The Company**, the **Transmission Licence**, as may be specified in such direction) the **Mandatory Ancillary Service** of **Frequency Response** referred to in **Grid Code CC** 8.1 by means of **Frequency** sensitive generation in accordance with the terms of this Paragraph 4.1.3 and a **Mandatory Services Agreement** but subject always to and in accordance with the relevant part or parts of the **Grid Code** applicable thereto.

Definitions

4.1.3.2 For the purposes of this Paragraph 4.1.3:

(i) "**Frequency Response Service**" means the **Mandatory Ancillary Service** of **Frequency Response** and any **Commercial Ancillary Service** of **Frequency Response** as may be agreed to be provided by a **User** from time to time;

(ii) the **Mandatory Ancillary Service** of **Frequency Response** shall constitute operation of a **BM Unit** in accordance with **Grid Code CC** 6.3.7 and **BC** 3.5 (with the exception of **BC** 3.5.2), including, without limitation, under normal operating conditions with the speed governor set so that it operates with an overall speed droop of between 3% and 5% so as to provide the applicable levels of **Response** referred to in Paragraph 4.1.3.7;

(iii) the term "instruction" means a communication whether by telephone or automatic logging device or facsimile from **The Company** to the **User** instructing a **User** in accordance with **Grid Code BC** 2.8 and this Paragraph 4.1.3 to provide any **Frequency Response Service**, and derivations of the term shall be construed accordingly;

(iv) the amendment of an existing instruction shall be deemed to be a new instruction;

(v) an instruction will prevail until either it is countermanded by **The Company** or until the **BM Unit** to which the instruction relates is **De-synchronised** (whichever is first to occur).

The Company's *Instructions to provide* ***Mode A Frequency Response***

4.1.3.3 For the purposes of instructions and calculation of payments, the **Mandatory Ancillary Service** of **Frequency Response** as described in this Paragraph 4.1.3 shall be referred to as "**Mode A Frequency Response**".

4.1.3.4 **The Company** may at any time instruct a **User** to operate any one or more **BM Unit(s)** so as to provide the following components of **Mode A Frequency Response**:-

(a) **Primary Response**;

(b) **Secondary Response**;

(c) **High Frequency Response**,

in any of the permissible combinations set out in the relevant table in the **Mandatory Services Agreement**.

4.1.3.5 **The Company** shall not instruct a **User** to provide **Mode A Frequency Response** and any **Commercial Ancillary Service** of **Frequency Response** simultaneously.

4.1.3.6 In the event that any instruction to provide **Frequency Response** does not state whether the instruction is to provide **Mode A Frequency Response** or any **Commercial Ancillary Service** of **Frequency Response**, such instruction shall be deemed to be an instruction to provide **Mode A Frequency Response**.

User's *Obligation to Provide* ***Response***

4.1.3.7 When a **User** is instructed in accordance with Paragraphs 4.1.3.4 and/or 4.1.3.6 to operate a **BM Unit** so as to provide any component(s) of **Mode A Frequency Response**, that **User** shall operate that **BM Unit** so as to provide, for any **Frequency Deviation** and at any level of **De-Load**, at least the amount of **Primary Response** and/or **Secondary Response** and/or **High Frequency Response** set out respectively in the relevant **Frequency Response Capability Data** tables in the **Mandatory Services Agreement** (as such tables are to be interpreted in accordance with Paragraph 4.1.3.11).

4.1.3.7A For the avoidance of doubt a **User** shall ensure that the **Transmission Entry Capacity**, and if relevant the **STTEC** and\or **LDTEC** and\or any **Temporary Received TEC** less any **Temporary Donated TEC**, for the relevant **Connection**

Site shall be sufficient to enable it to comply with its obligations under Paragraph 4.1.3.7 above at all times and in respect of all **BM Units.**

Calculation of Payments

4.1.3.8 The payments to be made by **The Company** to a **User** hereunder in respect of the provision of any **Mode A Frequency Response** from a **BM Unit** shall be comprised of **Holding Payments** and **Response Energy Payments** and shall be determined in accordance with the formulae in, respectively, Paragraphs 4.1.3.9 and 4.1.3.9A and in accordance with Paragraphs 4.1.3.10 to 4.1.3.12 inclusive.

*Payment Formulae - **Holding Payments***

4.1.3.9 The **Holding Payments** for a **BM Unit** to be made by **The Company** to a **User** referred to in Paragraph 4.1.3.8 shall be calculated in accordance with the following formula:-

$$HP_M = P_M + H_M + S_M$$

Where:

HP_M is the **Holding Payment** to be made to the **User** calculated in £ per minute.

P_M is the payment per minute to be made by **The Company** to the **User** for the **Ancillary Service** of **Primary Response** provided by the **User** from the **BM Unit** concerned pursuant to an instruction from **The Company** to provide **Mode A Frequency Response**, and is calculated as follows:-

$$P_M = (P_{PR} \times P_{MW}(1 - SF_P)) \times K_T \times K_{GRC} \times \left[\frac{1}{60}\right]$$

H_M is the payment per minute to be made by **The Company** to the **User** for the **Ancillary Service** of **High Frequency Response** provided by the **User** from the **BM Unit** concerned pursuant to an instruction from **The Company** to provide **Mode A Frequency Response**, and is calculated as follows:-

$$H_M = (H_{PR} \times H_{MW}(1 - SF_H)) \times K_T \times K_{GRC} \times \left[\frac{1}{60}\right]$$

S_M is the payment per minute to be made by **The Company** to the **User** for the **Ancillary Service** of **Secondary Response** provided by the **User** from the **BM Unit** concerned pursuant to an instruction from **The Company** to provide **Mode A Frequency Response**, and is calculated as follows:-

$$S_M = (S_{PR} \times S_{MW}(1 - SF_S)) \times K_T \times K_{GRC} \times \left[\frac{1}{60}\right]$$

In this Paragraph 4.1.3.9, the following terms shall have the following meanings:-

P_{PR} = the appropriate payment rate for **Primary Response** determined in accordance with Paragraph 4.1.3.13;

P_{MW} = the **Primary Response** capability (expressed in MW) for the level of **De-Load** of the **BM Unit** concerned at the end of the minute in which the service is provided;

H_{PR} = the appropriate payment rate for **High Frequency Response** determined in accordance with Paragraph 4.1.3.13;

H_{MW} = the **High Frequency Response** capability (expressed in MW) for the level of **De-Load** of the **BM Unit** concerned at the end of the minute in which the service is provided;

S_{PR} = the appropriate payment rate for **Secondary Response** determined in accordance with Paragraph 4.1.3.13;

S_{MW} = the **Secondary Response** capability (expressed in MW) for the level of **De-Load** of the **BM Unit** concerned at the end of the minute in which the service is provided;

K_T = the ambient temperature adjustment factor. **The Company** and each **User** acknowledge and agree, as between **The Company** and that **User**, that K_T shall be deemed to be 1 for the purposes of calculating payments until such time as they agree upon an appropriate formula and a suitable method of measuring the ambient temperature on a minute by minute basis which shall be set out in the **Mandatory Services Agreement**. In the event that any agreed method of measuring the ambient temperature on a minute by minute basis should fail following its implementation, then **The Company**

and each **User** acknowledge and agree, as between **The Company** and that **User**, that K_T shall be deemed to be 1 until the method of measuring the ambient temperature on a minute by minute basis is restored;

K_{GRC} = where the **BM Unit** is a **CCGT Module**, the plant configuration adjustment factor set out in the relevant table in the **Mandatory Services Agreement** for the configuration of the **BM Unit** concerned at the time at which the capability to provide the service is carried, otherwise 1;

SF_P = 0, subject to Paragraph 4.1.3.21 (e);

SF_S = 0, subject to Paragraph 4.1.3.21 (e);

SF_H = 0, subject to Paragraph 4.1.3.21 (e).

*Payment Formulae – **Response Energy Payment***

4.1.3.9A (a) The **Response Energy Payments** for **BM Unit** i in **Settlement Period** j to be made by **The Company** to a **User** referred to in Paragraph 4.1.3.8 shall be calculated in accordance with the following formulae:-

$$REP_{ij} = RE_{ij} \times \text{Reference Price}$$

But so that where REP_{ij} is negative such amount shall be paid by the **User** to **The Company**.

Where:

REP_{ij} is the **Response Energy Payment** to be made to or, as the case may be, by the User; and

RE_{ij} is the expected response energy for **BM Unit** i in **Settlement Period** j calculated as follows:-

$$RE_{ij} = \int_0^{SPD} \left[\begin{array}{l} \max(FR_{ij}(t),0) \times (1 - SF_{LF}) \\ + \min(FR_{ij}(t),0) \times (1 - SF_H) \end{array} \right] \times K_T \times K_{GRC}\, dt$$

Where:

$\int_0^{SPD} dt$ is the integral at times t, over the **Settlement Period** duration.

SF_{LF} is equal to SF_P in the case of a **BM Unit** being instructed to deliver **Primary Response** without **Secondary Response** or the mean of SF_P and SF_S in the case of a **BM Unit** being instructed to deliver **Primary Response** and **Secondary Response**.

SF_P, SF_S, SF_H, K_T and K_{GRC} have the meanings ascribed to them in Paragraph 4.1.3.9.

$FR_{ij}(t)$ is the expected change in **Active Power** output for **BM Unit** i, at time t (resolved to the nearest integer minute), expressed in MW derived from the relevant **Frequency Response Power Delivery Data** table in the **Mandatory Services Agreement** (as such table is interpreted in accordance with Paragraph 4.1.3.11) by reference to the level of **De-Load** of the **BM Unit** concerned at the end of the minute and the mean **Frequency Deviation** over that minute when that **BM Unit** is providing **Mode A Frequency Response** and zero at all other times.

For this purpose:-

(i) for a positive **Frequency Deviation** the expected change in **Active Power** output of **BM Unit** i shall be derived from the table entitled "**High Frequency Response Power Delivery – Mode A**" set out in the **Mandatory Services Agreement** and shall be signed negative; and

(ii) for a negative **Frequency Deviation**, the expected change in **Active Power** output of **BM Unit** i shall be derived from:

A) the table entitled "Primary Response Power Delivery – Mode A" in the case of a **BM Unit** being instructed to deliver **Primary Response** without **Secondary Response**; or

B) the table entitled "Primary and Secondary Response Power Delivery – Mode A" in the case of a **BM Unit** being instructed to deliver

Primary Response and **Secondary Response**,

in each case set out in the **Mandatory Services Agreement** and shall be signed positive.

Where: RE_{ij} is positive then:

Reference Price = max ($\sum_s$ {**PXP_{sj}** x **QXP_{sj}**} / $\sum_s$ {**QXP_{sj}**} x 1.25, 0)

where $\sum_s$ represents the sum over all **Market Index Data Providers**.

Where RE_{ij} is negative then:

Reference Price = max ($\sum_s$ {**PXP_{sj}** x **QXP_{sj}**} / $\sum_s$ {**QXP_{sj}**} x 0.75, 0)

where $\sum_s$ represents the sum over all **Market Index Data Providers**

(b) In this Paragraph 4.1.3.9A, the following terms shall have the meanings ascribed to them in the **Balancing and Settlement Code**:-

"PXP_{sj}"
"QXP_{sj}"
"SPD"
"Market Index Data Provider"

4.1.3.10 **The Company** and each **User** acknowledge and agree, as between **The Company** and that **User**, that no **Holding Payment** or **Response Energy Payment** shall be payable except in relation to periods in respect of which instructions have been issued by **The Company** pursuant to this Paragraph 4.1.3.

*Interpretation of Tables – Levels of **Response***

4.1.3.11 The figures for **Response** set out in the Frequency Response Capability Data tables and Frequency Response Power Delivery Data tables in the **Mandatory Services**

Agreements shall be given in relation to specific **Frequency Deviations** and to specific levels of **De-Load** for a **BM Unit**. Such tables shall, for the purposes of Paragraphs 4.1.3.7 and 4.1.3.9A(a), be construed in accordance with this Paragraph 4.1.3.11. Subject to Paragraphs 4.1.3.11(d) and (e):-

(a) for a **Frequency Deviation** at a given time differing from the figures given in a table, the level of **Response** shall be calculated by linear interpolation from the figures specified in the table in respect of **Frequency Deviations**;

(b) for a level of **De-Load** at a given time differing from the figures given in a table, the level of **Response** shall be calculated by linear interpolation from the figures specified in the table in respect of levels of **De-Load**. For the avoidance of doubt, **Frequency Sensitive Mode** shall not be instructed for any **De-Load** greater than the maximum level of **De-Load** given in the relevant Frequency Response Capability Data table;

(c) in respect of any time in relation to which both Paragraphs 4.1.3.11(a) and (b) apply, the level of **Response** shall be calculated by dual linear interpolation from the figures specified in the table in respect of **Frequency Deviations** and in respect of levels of **De-Load**;

and

(d) for any **Frequency Deviation** greater than the greatest **Frequency Deviation** given in a table (whether positive or negative), the level of **Response** shall be calculated by reference to the greatest **Frequency Deviation** (positive or negative, as the case may be) given in that table; and

(e) for the purposes of calculating levels of **Response** in respect of **Frequency Deviations** lower than those specified in a table, the relevant table(s) shall be deemed to specify a level of zero **Response** for a **Frequency Deviation** of zero.

Interpretation of Tables – Levels of Holding Payment

4.1.3.12 The Frequency Response Summary Data table in the **Mandatory Services Agreement** shall set out figures in respect of given levels of **De-Load** for the purposes of calculating payment in accordance with the formulae in Paragraph 4.1.3.9. Where the level of **De-Load** of the **BM Unit** is other than one of the levels given in such table, then, the figure for P_{MW}, S_{MW} or H_{MW} as the case may be, shall be calculated by linear interpolation from the figures in such table in respect of levels of **De-Load**.

User's *submission of* ***Holding Payment*** *Rates*

4.1.3.13 The following terms shall apply to determine the payment rates for **Primary Response**, **High Frequency Response** and **Secondary Response** used in the calculation of **Holding Payments** in accordance with Paragraph 4.1.3.9 which shall apply in respect of the provision of **Mode A Frequency Response** by the **User** to **The Company** from one or more **BM Units** in a calendar month (and, for the purposes thereof, all dates specified in this Paragraph 4.1.3.13 unless stated otherwise refer to the immediately preceding calendar month):-

(a) By the fifth **Business Day** of the calendar month, **The Company** shall publish on its web-site information relating to **The Company's** requirement for **Mode A Frequency Response** (in MW) in the next following calendar month.

(b) By the fifteenth **Business Day** of the calendar month, the **User** may in relation to any of its **BM Units** identified in a **Mandatory Services Agreement** to which the **User** is a party submit a single notification to **The Company** (in a form and by such method as shall be prescribed by **The Company** from time to time) specifying in respect of that **BM Unit** the payment rates to apply in determining the **Holding Payments** for the provision of **Mode A Frequency Response** during the next following calendar month, each such notification to specify:-

(i) the **BM Unit** in question;

(ii) the payment rate for **Primary Response**;

(iii) the payment rate for **High Frequency Response**; and

(iv) the payment rate for **Secondary Response**.

(c) Payment rates submitted by the **User** in accordance with Paragraph 4.1.3.13(b) must be:-

(i) quoted in pounds sterling to the nearest penny;

(ii) quoted in units of £/MW/h; and

(iii) no greater than £[9999.99].

(d) Upon receipt of a notification from the **User** made in accordance with Paragraph 4.1.3.13(b), **The Company** shall publish details of such notification in a report issued in accordance with Paragraph 4.1.3.13(A)(a) and, subject always to rectification (if any) of payment rates pursuant to Paragraph 4.1.3.13(e), **The Company** shall apply published payment rates for **Primary Response**, **High Frequency Response** and **Secondary Response** in calculating the **Holding Payments** for the relevant **BM Unit** in the next following calendar month.

(e) The **User** shall have the right, to be exercised within one **Business Day** of the publication of payment rates in respect of a **BM Unit** in accordance with Paragraph 4.1.3.13(d), to notify **The Company** (in a form and by such method as shall be prescribed by **The Company** from time to time) of any discrepancy between those payment rates and the actual payment rates submitted by the **User** in respect of that **BM Unit** in accordance with Paragraph 4.1.3.13(b). Upon receipt of any such notification, **The Company** shall rectify the report issued in accordance with Paragraph 4.1.3.13A(a) and shall publish the rectified report in accordance with Paragraph 4.1.3.13A(b).

(f) In the absence of a notification from a **User** in accordance with Paragraph 4.1.3.13(b) in respect of the provision by a **BM Unit** of **Mode A Frequency Response** in the next following calendar month, then the payment rates for **Primary Response**, **High Frequency Response** and **Secondary Response** to

apply in determining the **Holding Payments** for that **BM Unit** in respect of that calendar month shall be determined as follows:-

(i) where the **User** has never in respect of any previous calendar month submitted a notification in accordance with Paragraph 4.1.3.13(b) in respect of the provision by that **BM Unit** of **Mode A Frequency Response**, the payment rate to apply to the provision of each of **Primary Response**, **High Frequency Response** and **Secondary Response** from that **BM Unit** in that calendar month shall be deemed to be either:-

(aa) the payment rates for **Primary Response**, **High Frequency Response** and **Secondary Response** prevailing immediately prior to the date of implementation of **Amendment Proposal** CAP047; or

(bb) where no payment rates as referred to in paragraph (aa) above subsisted at the date of implementation of **Amendment Proposal** CAP047, £00.00/MW/h; or

(ii) in all other cases, the payment rates for **Primary Response**, **High Frequency Response** and **Secondary Response** which shall apply in respect of the provision by that **BM Unit** of **Mode A Frequency Response** in that calendar month shall be the payment rates most recently published in accordance with Paragraph 4.1.3.13A(a) or (b) (as the case may be) for that **BM Unit** in respect of a previous calendar month;

(g) Paragraph 4.4.2.2 shall not apply to the payment rates for **Primary Response**, **High Frequency Response** and **Secondary Response** determined in accordance with this Paragraph 4.1.3.13.

*Publication of **Holding Payment** Rates and other information*

4.1.3.13A (a) **The Company** shall use reasonable endeavours to publish on its web-site by the 16th **Business Day** of each calendar month, a report containing the following

information in respect of each applicable **User**'s **BM Unit(s)** to apply in respect of the next following calendar month:-

(i) the payment rates for **Primary Response**, **High Frequency Response** and **Secondary Response** to apply in determining the **Holding Payments** for the next following calendar month as determined in accordance with Paragraph 4.1.3.13;

(ii) the available **Response** volume (in such form and manner as shall be prescribed by **The Company** from time to time).

(b) Where any payment rates published in a report issued in accordance with Paragraph 4.1.3.13A(a) are rectified by **The Company** in accordance with Paragraph 4.1.3.13(e), **The Company** shall as soon as reasonably practicable thereafter publish the rectified report on its web-site.

(c) In respect of each day in a calendar month, **The Company** shall use reasonable endeavours to publish on its web-site by the third **Business Day** of the calendar month following that calendar month, provisional data in respect of all **BM Units** details of instructions issued by **The Company** in accordance with Paragraph 4.1.3.4 for each of **Primary Response, High Frequency Response** and **Secondary Response** (in such form and manner as shall be prescribed by The Company from time to time). The **Users** recognise that the provisional data may differ from the data to be provided under Paragraph 4.1.3.13A (d) and therefore any reliance upon this provisional data is entirely at the **User's** risk.

(d) In respect of each day in a calendar month, **The Company** shall, by the ninth **Business Day** of the calendar month following that calendar month, publish on its web-site in respect of all **BM Units** details of instructions issued by **The Company** in accordance with Paragraph 4.1.3.4 for each of **Primary Response**, **High Frequency Response** and **Secondary Response** (in such form and manner as

shall be prescribed by **The Company** from time to time).

(e) Each **User** consents to the disclosure by **The Company** of the information referred to in Paragraphs 4.1.3.13A(a) and (b) in so far as it relates the provision of **Mode A Frequency Response** from its **BM Unit(s)**, provided always that **The Company** shall not be bound to comply with the provisions of Paragraphs 4.1.3.13A(a) and (b) with regard to the provision of information to the extent that to do so would be likely to restrict, distort or prevent competition in the provision of **Mode A Frequency Response**.

*Requests to Amend Levels of **Response***

4.1.3.14 Where either the **User** or **The Company** reasonably considers in light of operating experience that the levels of **Response** set out in the Frequency Response Capability Data tables and / or the Frequency Power Delivery Data tables in the **Mandatory Services Agreement** do not represent the true operating capabilities of a **BM Unit(s),** the **User** or **The Company** (as the case may be) shall have the right not more than once every two months (or otherwise at any time with the specific agreement of the other party to the **Mandatory Services Agreement**) to request (provided always that such request be accompanied by a reasonable justification therefor) that the levels of **Response** set out in the relevant response table(s) in the **Mandatory Services Agreement** be reviewed and, if appropriate, amended by agreement with such other party, such agreement not to be unreasonably withheld or delayed.

*Procedure for Amendments to Levels of **Response***

4.1.3.15 Any amendments agreed by **The Company** and a **User** pursuant to Paragraph 4.1.3.14 or determined by an arbitrator or panel of arbitrators under the **Dispute Resolution Procedure** in the circumstances referred to in Paragraph 4.1.3.16 shall not become effective until (in the case of agreed amendments) a date at least five **Business Days** after an amending agreement is entered into between **The Company** and the **User** in accordance with the **Mandatory Services Agreement** or, in the case of determined amendments, such other date as may be determined by an arbitrator or panel of arbitrators under the

Dispute Resolution Procedure subject always to Paragraphs 4.1.3.17 and 4.1.3.18.

Failure to Agree Amendments

4.1.3.16 If **The Company** and a **User** are unable to agree any amendments requested pursuant to Paragraph 4.1.3.14 within 28 days of either of them serving on the other notice of its intention to invoke the **Dispute Resolution Procedure** then either party may initiate the procedure for resolution of the issue as an **Other Dispute** in accordance with Paragraph 7.4.

Dispute Resolution Procedure

4.1.3.17 **The Company** and each **User** acknowledge and agree, as between **The Company** and that **User**, that rule 12.1(p) of the **Electricity Arbitration Association** shall apply to any arbitration proceedings initiated pursuant to Paragraph 7.4 in the circumstances referred to in Paragraph 4.1.3.16, but that the changes determined by any arbitrator or panel of arbitrators shall not apply in respect of any period prior to the date on which the **Dispute Resolution Procedure** is invoked.

Implementation of Determinations

4.1.3.18 Any amendments to levels of **Response** determined by an arbitrator or panel of arbitrators under the **Dispute Resolution Procedure** in the circumstances referred to in Paragraph 4.1.3.16 shall take effect from the date five **Business Days** following the relevant determination.

Implementation of Continuous Monitoring System

4.1.3.19 To the extent the same shall be acceptable to **The Company** and a **User** on the basis of a cost benefit analysis, **The Company** and a **User** agree, as between **The Company** and that **User**, to the implementation of a continuous monitoring system as soon as is reasonably practicable. The continuous monitoring system shall be in accordance with the relevant principles set out in Paragraph 4.1.3.21 for the purposes of confirming performance of the **BM Units** and adjusting payments pursuant to this Paragraph 4.1.3.

Incident Based Monitoring System

4.1.3.20 Pending implementation of the continuous monitoring system, **The Company** and each **User** agree, as between **The Company** and that **User**, to implement an incident

based monitoring scheme for the purpose of confirming the performance of the **BM Units** pursuant to this Paragraph 4.1.3. Such incident based monitoring scheme shall be in accordance with the relevant principles set out in Paragraph 4.1.3.21. Neither **The Company** nor the **User** shall unreasonably withhold or delay such agreement and/or implementation.

Genset Response Monitoring

Introduction

4.1.3.21 (a) This Paragraph 4.1.3.21 sets out the principles relating to:

(i) the proposed continuous monitoring system to be implemented pursuant to Paragraph 4.1.3.19; and

(ii) the incident based monitoring system to apply until such time as implementation of the continuous monitoring system takes place.

Some elements of the continuous monitoring system are currently undergoing testing and development and it is accepted that if final testing of these elements proves unsatisfactory alternatives will need to be developed. Further, implementation of the continuous monitoring system shall be subject to its acceptability to **The Company** and **Users** on the basis of a cost benefit analysis.

Wherever possible the technical specification of both the incident based monitoring system and the continuous monitoring system will be designed so as to enable future development or enhancement.

Aims of Project

(b) The aim of the monitoring project (which includes, without limitation, the development of the incident based monitoring system and the continuous monitoring system) is to develop a response monitoring system which will measure the response performance of generators against the levels of

Frequency Response required to be provided under **Mandatory Services Agreements**.

Incident Based Monitoring Scheme

(c) Details of the incident based monitoring scheme (including without limitation the definitions of Shortfall Period and Incident, the calculation of service delivery and the determination of Incident start and end times) will be more particularly set out in a document entitled "Procedure for Incident Based Response Monitoring" ("the PIRM Document") to be produced by **The Company** and agreed by all relevant **Users** (such agreement not to be unreasonably withheld or delayed).

For the avoidance of doubt during the period during which the incident based monitoring scheme applies, and prior to the implementation of the continuous monitoring system, for the purposes of the formulae in Paragraphs 4.1.3.9 and 4.1.3.9A, the values of SF_P, SF_S and SF_H shall be zero, such that no payment reduction shall apply during such period in respect of shortfall.

Continuous Based Monitoring Scheme – Confirmation of Response Delivery

(d) The main objective of the continuous monitoring scheme is to provide a quantitative measure of **Frequency Response** delivery against which payment can be justifiably made and to reduce payments if delivery does not comply with the **CUSC** and the **Mandatory Services Agreement**. As the capability of a **BM Unit** to provide the level of **Response** required pursuant to this Paragraph 4.1.3 for any change in **System Frequency** occurring during the period of delivery of Response pursuant to a prior change in **System Frequency** will be affected by the level of **Response** then being delivered, relevant fluctuations in **System Frequency** should to this extent be taken into account by the continuous monitoring scheme for the purpose of calculating payment levels.

Determination of Response Shortfall

(e) For the purposes of the continuous monitoring system, the **Response** shortfall may take three forms:-

(i) average **Primary Response** under-delivery;

(ii) average **Secondary Response** under-delivery;

(iii) average **High Frequency Response** under-delivery,

in each case over a Shortfall Period (such term to be defined prior to implementation of the continuous monitoring system).

Upon the implementation of the continuous monitoring system, for the purposes of determining any such average under-delivery, SF_P, SF_S and SF_H shall be the average under-delivery of **Primary Response**, **Secondary Response** and **High Frequency Response** respectively during the Shortfall Period in which the **Ancillary Service** was, or should have been, provided. For the purposes of the formulae in Paragraphs 4.1.3.9 and 4.1.3.9A, such average under-delivery will be determined using a continuous plant response assessment algorithm which is under development and which will be agreed with the **User** prior to its implementation and expressed in terms of $0 \leq SF \leq 1$.

Measurement of System Variables

(f) In relation to the continuous monitoring system measurement of **System Frequency** and generator output power will be required local to the **BM Unit**. **Synchronised** time tagging of both power and **Frequency** will be required.

Frequency is required as the fundamental driving variable of the contract model software. Access to a voltage source to enable **Frequency** to be measured is not expected to cause any difficulty. The measurement of generator output power will also be required every second. Cost effective access to this measurement is, however, less straight forward. Covered below are two options describing how this will be achieved. It is expected that normally the FMS

interface unit will be the method used; however, where the **BM Unit** concerned has derogations from FMS, method two may be used.

FMS Interface Unit

(g) The use of the Final Metering System (FMS) represents a logical method of measurement since it eliminates the high cost associated with running cables to access CTs and VTs.

The high accuracy integrated data from FMS will be used to re-generate a power profile and curve fitting techniques will be applied to improve accuracy. This instantaneous power curve will then be sampled every second to obtain the required values.

Direct Measurement

(h) Where for the reasons detailed in Paragraph 4.1.3.21(f) it is not possible to use the FMS interface unit, the use of 'ISAT' type transducers will be employed to interface between the monitoring equipment and the measurement transformers' secondary circuit.

It is envisaged that generators seeking derogations from FMS will be supportive in establishing convenient VT and CT secondary connections for this purpose.

Contract Model

(i) The contract model is the heart of the continuous monitoring system and it is crucial to the philosophy behind the system, namely that of modelling the **Mandatory Services Agreement** and not the **BM Unit** itself.

Given the difficulty in measuring **Frequency Response** directly on loaded plant, the need to compare changes in power delivery against expectation is evident. Comparison against this model output, which in turn is based on agreed and legally binding contracts, permits an identifiable quantity of non conformity to be measured and payments to be suitably reduced.

Therefore, since the **Mandatory Services Agreement** itself is the quantifying factor, there can be no redress due to assumptions regarding the technical attributes of the **BM Unit** other than those taken into account in setting the levels of **Response**.

Functional Objective

(j) In relation to the continuous monitoring system, the model will comprise software which uses system and instructed variables to access the contract look-up tables. The look-up tables used will precisely mimic the response tables set out in **Mandatory Services Agreements**. These variables in turn will be processed using an algorithm to determine the levels of **Response** expected at any instant in time.

It is intended that this process will be effective during both small and large **Frequency Deviations**. Indeed with regard to reduction in payment and estimated **Response** capability, response to small **Frequency Deviations** is extremely important.

Input Data

(k) In relation to the continuous monitoring system, inputs to the contract model will include **Frequency**, all contract table data, target load, **Target Frequency**, the latest genset availability, the response instruction, LF setting (if electronically despatched) and any other information required which may be specified in the **Mandatory Services Agreement**.

Comparator

(l) In relation to the continuous monitoring system, the comparator will determine the difference between the measured change in the level of **Output** from the **BM Unit** by way of **Frequency Response** and the change in **Output** level that is specified in the **Mandatory Services Agreement**.

4.1.3.22 If, at any time during the term of a **Mandatory Services Agreement**, there is a variation in the security standards with which **The Company** is obliged to comply and such variation would, in a **User**'s reasonable opinion, materially affect the operation of the services to be provided under that **Mandatory Services Agreement**, **The Company** and that **User** shall negotiate in good faith with a view to agreeing

and implementing appropriate amendments to any relevant **Mandatory Services Agreement**. If they are unable to reach agreement within 28 days of either of them serving on the other notice of its intention to invoke the **Dispute Resolution Procedure**, either of them may initiate the procedure for resolution of the issue as an **Other Dispute** in accordance with Paragraph 7.4.

4.2 MAXIMUM GENERATION

4.2.1 Application

The provisions of this Paragraph 4.2 shall apply to **The Company** and a **User** in respect of the provision by that **User** to **The Company** of **Maximum Generation** where a **Maximum Generation Service Agreement** has been entered into and is in force between **The Company** and that **User**.

4.2.2 Provision of Maximum Generation

Each **User** hereby agrees, as between **The Company** and that **User**, to use reasonable endeavours to make available and provide **Maximum Generation** from each of the **Maximum Generation BM Unit(s)** in accordance with the terms of this Paragraph 4.2 in respect of each **Operational Day** during the term of the **Maximum Generation Service Agreement**.

4.2.3 Availability of Maximum Generation

4.2.3.1 By 15.00 hours on each Wednesday, the **User** may notify **The Company** by facsimile in the form set out in Schedule 1 to this Section 4 (a "**Weekly Maximum Generation Declaration**") of the availability of **Maximum Generation** in relation to each of the **Maximum Generation BM Unit(s)** in the following **Week**. Failure to submit a **Weekly Declaration** in accordance with this Paragraph 4.2.3 shall be deemed to be an indication of availability or unavailability (as the case may be) of **Maximum Generation** for each **Operational Day** in the following **Week** as notified by the **User** in the last **Weekly Maximum Generation Declaration** submitted in accordance with this Paragraph 4.2.3, if any, or if no previous **Weekly Maximum Generation Declaration** has been submitted, in the amount of the **Indicative Maximum Generation Capability** specified in the **Maximum Generation Service Agreement** between **The Company** and that **User**.

4.2.3.2 The **User** may indicate in the **Weekly Maximum Generation Declaration** its best estimate of the amount of **Maximum Generation** available (the "**Indicative Maximum Generation Capability**"). If no such indication is given, the **User** shall be deemed to have notified **The Company** of the amount of **Indicative Maximum Generation Capability** set out in the **Maximum Generation Service Agreement** between **The Company** and that **User**.

4.2.3.3 If at any time the **User** becomes aware that, in respect of any **Maximum Generation BM Unit(s)**, there are changes to the availability of **Maximum Generation** and/or the **Indicative Maximum Generation Capability** for all or part of any **Operational Day** as specified in the relevant **Weekly Maximum Generation Declaration** of any **Maximum Generation Redeclaration** (as the case may be), it shall notify **The Company** forthwith by facsimile in the form set out in Schedule 2 to this Section 4 (a "**Maximum Generation Redeclaration**").

4.2.3.4 Each **Maximum Generation BM Unit** in respect of which **Maximum Generation** is (or is deemed to be) declared or redeclared to be available in all or part of an **Operational Day** in accordance with this Paragraph 4.2.3 is hereinafter referred to in respect of such **Operational Day** (or part thereof) as "an **Available BM Unit**".

4.2.4 **Utilisation of Maximum Generation**

4.2.4.1 **The Company** may, as between **The Company** and that **User,** at any time instruct the **User** to provide **Maximum Generation** from an **Available BM Unit** (a "**Maximum Generation Instruction**") and the **User** shall use reasonable endeavours to provide **Maximum Generation** from such **Available BM Unit**.

4.2.4.2 **The Company** shall only issue a **Maximum Generation Instruction** where an **Available BM Unit** has been instructed to generate or is already generating (in each case) at the prevailing **Maximum Export Limit** for that **Available BM Unit**.

4.2.4.3 If, following the issue by **The Company** of a **Maximum Generation Instruction** in respect of an **Available BM Unit**, the **User** submits to **The Company** (in accordance with **Grid Code BC** 1) a revised **Maximum Export Limit** for that **Available BM Unit**, that **Available BM Unit** shall be deemed to have ceased providing **Maximum Generation** immediately upon receipt by **The Company** of such revised **Maximum Export Limit**.

4.2.4.4 Any **Maximum Generation Instruction** issued by **The Company** shall be an **Emergency Instruction**. The method of issuing any **Maximum Generation Instruction** shall be specified in the **Maximum Generation Service Agreement**.

4.2.4.5 **The Company** may instruct the **User** to cease the provision of **Maximum Generation** from the instructed **Available BM Unit** at any time.

4.2.4.6 On receipt of a **Maximum Generation Instruction** the **User** shall use reasonable endeavours to provide **Maximum Generation** from the **Available BM Unit** continuously until the earlier of:-

(a) the expiry of a period of 120 minutes; and

(b) the time of issue by **The Company** of an instruction to cease provision

4.2.4.7 The provision of **Maximum Generation** from an **Available BM Unit** shall not be achieved by the transfer of the **Station Demand** of the **Power Station** to the **Station Transformer(s)**.

4.2.5 **Payment for Maximum Generation**

4.2.5.1 The **Maximum Generation Energy Payment** to be made by **The Company** to the **User** following the issue of a **Maximum Generation Instruction** by **The Company** for the provision of **Maximum Generation** in **Operational Days** in calendar month m, (UF_m) shall be calculated in accordance with the following formula:-

$$UF_m = \sum_{i=1}^{Units} UF_{im}$$

Where;

$$UF_{im} = \sum_{j \in M_m} \text{Min}\left(\left(Q\max_{ij} \times EP_{ij} \right), \left(X \times \frac{CEC}{2} \times EP_{ij} \right) \right)$$

In this Paragraph 4.2.5.1, the following terms shall have the following meanings:-

$\sum_{i=1}^{Units}$		the summation over all **Available BM Units** *i*

$\sum_{j \in M_m}$		the summation over all **Settlement Periods** *j*, in the set M_m of **Settlement Periods** in **Operational Days** in calendar month *m*
$Qmax_{ij}$		**Max** $\left(QM_{ij} - \left(FPN_{ij} + \sum_n \left(QAO_{ij}^n + QAB_{ij}^n\right)\right),0\right)$
EP_{ij}		the **Maximum Generation Energy Fee** (£/MWh), applicable in **Settlement Period** j, for **Available BM Unit** i
CEC		**Connection Entry Capacity** for the **Available BM Unit**
X		0.03 (or such other figure as may be either (i) set out in the **Maximum Generation Service Agreement** for the **Available BM Unit** or (ii) agreed or determined in accordance with Paragraphs 4.2.5.3 to 4.2.5.5 (inclusive))
QM_{ij}, FPN_{ij}, QAO_{ij} and QAB_{ij}		the meanings ascribed to them in the **Balancing and Settlement Code**

4.2.5.2 Where an **Available BM Unit** is at the time of issue of a **Maximum Generation Instruction** generating at a level below **Connection Entry Capacity** but the amount of MW delivered as **Maximum Generation** by such **Available BM Unit** is greater than 3% (or such other figure as **The Company** and the **User** may agree in the **Maximum Generation Service Agreement**) of the **Connection Entry Capacity** of that **Available BM Unit**, the **User** shall have the right to raise a dispute in accordance with the provisions of Paragraph 4.2.5.3 as to the amount of MW (represented by the value of factor X) by reference to which payment for provision of **Maximum Generation** shall be determined.

4.2.5.3 Where the provisions of Paragraph 4.2.5.2 apply:-

(a) the **User** may notify **The Company** in writing that it disagrees with the amount of MW (represented by the value of factor X) by reference to which **The Company** has determined the **Maximum Generation Energy Payment** set out in the **Provisional Statement** and the **User** shall specify in such notification the value of factor X which it considers represents

the amount of MW by reference to which payment for provision of **Maximum Generation** should be determined in accordance with Paragraph 4.2.5.1, provided always that any such notification shall be given within ten **Business Days** of receipt by the **User** of the **Provisional Monthly Statement**; and

(b) this Paragraph 4.2.5.3 and Paragraphs 4.2.5.4 and 4.2.5.5 shall apply to such matter in the place of Paragraphs 4.3.2.3, 4.3.2.7 and 4.3.2.8, and Paragraph 4.3.2 shall be read and construed accordingly.

The parties shall discuss and endeavour to resolve the matter prior to **The Company** sending out the **Final Monthly Statement**. If **The Company** and the **User** reach agreement, **The Company** shall set out in the **Final Monthly Statement** the adjustments required but, if it cannot be resolved, the calculations set out in the **Provisional Statement** and in the **Provisional Adjustments Statement** shall be binding upon the parties until such time as they are reversed or revised by agreement between the parties or otherwise (in accordance with Paragraphs 4.2.5.4 and 4.2.5.5) pursuant to the **Dispute Resolution Procedure**.

4.2.5.4 If a **User** and **The Company** fail to reach an agreement within ten **Business Days** of receipt by **The Company** of the **User's** written notification in accordance with Paragraph 4.2.5.5, then either party may, within twenty **Business Days** of receipt by **The Company** of the **User's** written notification, refer the matter to the **Authority** for determination as a **Charging Dispute** in accordance with Paragraph 7.3.

4.2.5.5 Where a dispute is resolved by issuance of a decision of the **Authority** pursuant to the **Dispute Resolution Procedure** in accordance with Paragraph 4.2.5.4 above, **The Company** shall (where appropriate) adjust the account between itself and the **User** accordingly in the next **Provisional Adjustments Statement** required to be issued under Paragraph 4.3.2.1. If such decision of the **Authority** is subsequently reversed or modified following judicial review of the **Authority's** decision, **The Company** shall adjust the account between itself and the **User** accordingly in the next **Provisional Adjustments Statement** which it issues.

4.2.5.6 The **Maximum Generation Energy Fee** for each **Available BM Unit** of a **User** will be that detailed in the **Maximum Generation Service Agreement** between **The Company** and that **User**.

4.2.5.7 The **User** shall have the right to notify **The Company** of a revised **Maximum Generation Energy Fee**, as between **The Company** and that **User,** not more than once every month. Such notification must be in writing and must be received by **The Company** no later than the fifteenth day of the calendar month. The revised **Maximum Generation Energy Fee** shall apply, as between **The Company** and that **User**, with effect on and from the first **Operational Day** of the calendar month following such notification.

4.2.6 **ABSVD Methodology Statement**

It is a condition of a **User** entering into a **Maximum Generation Service Agreement** that **Maximum Generation** is included in the determination of the **Applicable Balancing Services Volume Data** in respect of each **Contracted BM Unit** for the purposes of the **ABSVD Methodology Statement** and Section Q.6.4 of the **Balancing and Settlement Code**.

4.2.7 **Maximum Generation Event of Default**

Any failure by the **User** during the term of the **Maximum Generation Service Agreement** to comply with its obligations pursuant to Paragraph 4.2.6 in respect of any **Available BM Unit** and any **Settlement Period** shall constitute an event of default to which the terms of Paragraph 4.2.8 shall apply.

4.2.8 **Consequences of Maximum Generation Event of Default**

In respect of any event of default incurred by the **User** in respect of an **Available BM Unit** pursuant to Paragraph 4.2.7, **The Company** shall be entitled to withhold the **Maximum Generation Energy Payment** (if any) applicable to the relevant **Available BM Unit** and the **Settlement Period** in which such event of default occurred.

4.2.9 **Grid Code**

The provision by the **User** of **Maximum Generation** shall not relieve it of any of its obligations (where applicable) set out in the **Grid Code**.

4.2.10 **Safety**

Notwithstanding Paragraph 4.2.11, **The Company** accepts that any decision to keep an **Available BM Unit** operating above the prevailing **Maximum Export Limit** for that **Available BM Unit** is one for the **User** alone, and accepts that the **User** may change generation on the **Available BM Unit** if it believes it is necessary for safety reasons (whether relating to personnel or **Plant** or **Apparatus**). The responsibility for injury to personnel and damage to **Plant** and **Apparatus** owned and/or operated by the **User** caused by operation of an

Available BM Unit following the issue by **The Company** of **Maximum Generation Instruction** pursuant to Paragraph 4.2.4 therefore rests with the **User** and **The Company** shall have no liability whatsoever in connection therewith. The **User** shall indemnify and keep indemnified **The Company** in respect of liability for death or personal injury and/or damage to **Plant** and **Apparatus** owned and/or operated by **The Company** and arising out of or in connection with such operation of one or more **Available BM Unit(s)** above the prevailing **Maximum Export Limit** for such **Available BM Unit(s)** from time to time, save to the extent that:-

4.2.10.1 the **User** has operated the **Available BM Unit** in accordance with **Good Industry Practice**; and/or

4.2.10.2 such death or personal injury and/or damage to **Plant** and **Apparatus** is caused by **The Company's** negligent act or omission.

4.2.11 **Warranty**

The **User** warrants to **The Company** that it believes that operation of each of its **Maximum Generation BM Unit(s)** above the prevailing **Maximum Export Limit** for such **Maximum Generation BM Unit(s)** will be within its safe operating parameters (whether relating to personnel or **Plant** or **Apparatus**).

~~4.2.12.~~4.2.12 **Publication of Maximum Generation Information**

4.2.12.1 **The Company** shall use reasonable endeavours to publish on its web-site within five **Business Days** of signature of a **Maximum Generation Service Agreement,** or within five **Business Days** of receipt of any updated information in accordance with this Paragraph 4.2, details of the following information in respect of each **Maximum Generation BM Unit** specified in such **Maximum Generation Service Agreement**:-

(a) the **Maximum Generation Energy Fee**;

(b) the **Indicative Maximum Generation Capability**;

(c) the amount of factor X (as defined in Paragraph 4.2.5.1) if other than 0.03,

in such form and manner as shall be prescribed by **The Company** from time to time.

4.2.12.2 In respect of each **Operational Day** in a calendar month, **The Company** shall, by the tenth **Business Day** of the calendar month following that calendar month, publish on its web-site in respect of each relevant **Maximum Generation BM Unit(s)** the following details of each **Maximum Generation Instruction** (if any) issued by **The Company** in accordance with Paragraph 4.2.4:-

(a) the **Maximum Generation Energy Fee**;

(b) the period(s) for which **Maximum Generation** has been provided;

(c) the MW level(s) delivered as **Maximum Generation**,

in such form and manner as shall be prescribed by **The Company** from time to time.

4.2.12.3 Each **User** consents to the disclosure by **The Company** of the information referred to at Paragraphs 4.2.12.1 and 4.2.12.2 above in so far as it relates the provision of **Maximum Generation** from its **Maximum Generation BM Unit(s)**, provided always that **The Company** shall not be bound to comply with the provisions of this Paragraph with regard to the provision of information to the extent that to do so would be likely to restrict, distort or prevent competition in the provision of **Maximum Generation**.

4.2A SYSTEM TO GENERATOR OPERATIONAL INTERTRIPPING

4.2A.1 Application

The provisions of this Paragraph 4.2A shall apply to **The Company** and a **User** in respect of the provision by that **User** to **The Company** of **System to Generator Operational Intertripping** where details of a **System to Generator Operational Intertripping Scheme** are set out in Appendix F3 of the relevant **Bilateral Agreement**.

4.2A.2 Provision of System to Generator Operational Intertripping

4.2A.2.1 Each **User** hereby agrees, as between **The Company** and that **User**, to:-

(a) (save where **Force Majeure** applies) make available its **System to Generator Operational Intertripping Scheme** for arming at all times when **Active Power** is being exported to the **GB Transmission System** from the **Connection Site**

at which such **System to Generator Operational Intertripping Scheme** is located;

(b) arm the **System to Generator Operational Intertripping Scheme** in accordance with the terms of the relevant **Bilateral Agreement** when instructed by **The Company** (in accordance with **Grid Code** BC 2.8) by telephone (such instruction to be confirmed by facsimile substantially in the form set out in Schedule 3, Part I to this Section 4);

(c) (where an instruction from **The Company** has been confirmed by facsimile in accordance with Paragraph 4.2A.2.1(b) above) following the tripping of the **User**'s **Circuit Breaker(s)** upon receipt of a signal from the **System to Generator Operational Intertripping Scheme**:-

(i) restrict the export of **Active Power** from the **Connection Site** to the **GB Transmission System** to the level of MW specified in such facsimile confirmation (or such increased level(s) as **The Company** may subsequently notify pursuant to Paragraph 4.2A.2.2(c)(i)) ("the **Restricted MW Export Level**"); and

(ii) maintain such restricted export until such time as the **User** is notified by **The Company** in accordance with Paragraph 4.2A.2.2(c)(ii) that the **Restricted MW Export Level** no longer applies, whereupon the **User** shall be permitted to increase the export of **Active Power** from the **Connection Site** above the **Restricted MW Export Level**;

(d) comply with any special instructions given by **The Company** in the performance of its obligations under Paragraph 4.2A.2.1(c); and

(e) disarm the **System to Generator Operational Intertripping Scheme** when instructed by **The Company** (in accordance with **Grid Code** BC2.8) by telephone (such instruction to be confirmed by facsimile substantially in the form set out in Schedule 3, Part I to this Section 4).

4.2A.2.2 **The Company** hereby agrees to:-

(a) notify the **User** as soon as reasonably practicable following **The Company** becoming aware of the requirement for

arming of the **System to Generator Operational Intertripping Scheme**;

(b) (where relevant) take any steps necessary to arm the **System to Generator Operational Intertripping Scheme** in accordance with the terms of the relevant **Bilateral Agreement**;

(c) following the tripping of the **User**'s **Circuit Breaker(s)** upon receipt of a signal from the **System to Generator Operational Intertripping Scheme**, notify the **User**:-

(i) as soon as the **Restricted MW Export Level**, whilst still applying, can be increased; and/or

(ii) as soon as the **Restricted MW Export Level** (as may be increased from time to time pursuant to (i) above) no longer applies

each such notification to be in accordance with **Grid Code** BC 2.8 and to be made by telephone (such notification to be confirmed by facsimile substantially in the form set out in Schedule 3, Part II to this Section 4); and

(d) issue an instruction to disarm, referred to in Paragraph 4.2A.2.1(e), as soon as reasonably practicable following **The Company** becoming aware that the requirement for arming of the **System to Generator Operational Intertripping Scheme** has ceased (and such an instruction shall be deemed to have been issued for the purposes of this Paragraph 4.2A upon tripping of the **User**'s **Circuit Breaker**(s) upon receipt of a signal from the **System to Generator Operational Intertripping Scheme**).

4.2A.3 **Intertrip Volume**

Following the tripping of a **User**'s **Circuit Breaker**(s) following receipt of a signal from a **System to Generator Operational Intertripping Scheme**, the resulting reduction in **Output** for each tripped **BM Unit** i or (where relevant) any tripped **Generating Unit(s)** comprised in a **BM Unit** shall be determined in accordance with the relevant formula set out in the **ABSVD Methodology Statement**, where such resulting reduction in **Output** is termed SE_{sj}.

4.2A.4 **Payments to the User**

The Company shall make the following payments to the **User** in respect of **System to Generator Intertripping Schemes**:

(a) a **Capability Payment** shall be paid in respect of each **Category 2 Intertripping Scheme** and each **Category 4 Intertripping Scheme** as follows:-

(i) **The Company** shall pay to the **User** an amount ("the **Capability Payment**") in consideration of the installation of the **System to Generator Operational Intertripping Scheme** and the **User**'s obligations under Paragraphs 4.2A.2.1(a) and (b), being an amount per month determined by reference to the number of **Settlement Periods** during the month in question (and in respect of which the requirement for **System to Generator Operational Intertripping** is stated in Appendix F3 of the relevant **Bilateral Agreement**) and the payment rate (£/**Settlement Period**) specified in Schedule 4 to this Section 4; and

(ii) for the avoidance of doubt, where a **System to Generator Operational Intertripping Scheme** comprises both a **Category 2 Intertripping Scheme** and a **Category 4 Intertripping Scheme**, only one **Capability Payment** shall be payable by **The Company** to the **User** in respect thereof;

(b) subject always to Paragraph 4.2A.5, a **Restricted Export Level Payment** shall be paid in respect of each **Category 2 Intertripping Scheme**, each **Category 3 Intertripping Scheme** and each **Category 4 Intertripping Scheme** as follows:-

(i) the payment shall only be made where, following the tripping of the **User**'s **Circuit Breaker**(s) upon receipt of a signal from the **System to Generator Operational Intertripping Scheme**, restrictions on the export of **Active Power** from the **Connection Site** apply in accordance with the terms of Paragraph 4.2A.2.1(c) above at any time after the period of 24 hours has elapsed following such tripping; and

(ii) in such a case, **The Company** shall pay to the **User** upon request the **Restricted Export Level Payment**, by reference to the period from expiry of such 24 hour period until the time when **The Company**

notifies the **User** in accordance with Paragraph 4.2A.2.2(c)(ii) that the **Restricted MW Export Level** no longer applies ("the **Restricted Export Level Period**"); and

(c) subject always to Paragraph 4.2A.5, in respect of each **Category 2 Intertripping Scheme** and **Category 4 Intertripping Scheme**, where the **User**'s **Circuit Breaker**(s) are tripped upon receipt of a signal from the **System to Generator Operational Intertripping Scheme**, **The Company** shall pay to the **User** an amount ("the **Intertrip Payment**") being an amount (£/**Intertrip Contracted Unit**/trip) specified in Schedule 4 to this Section 4.

4.2A.5 **Withholding of payments**

The Company shall not be obliged to make any **Restricted Export Level Payment** or **Intertrip Payment** pursuant to Paragraph 4.2A.4 where the tripping of **BM Unit(s)** or (where relevant) **Generating Unit**(s) comprised in a **BM Unit** occurs:-

(a) during any period where the **System to Generator Operational Intertripping Scheme** is not instructed by **The Company** to be armed in accordance with Paragraphs 4.2A.2.2(a) and 4.2A.2.2(d); and/or

(b) where the **User** has failed to arm the **System to Generator Operational Intertripping Scheme** in accordance with the terms of Paragraph 4.2A.2.1(b); and/or

(c) where the **User** has failed to exercise **Good Industry Practice** to restrict the export of **Active Power** from the **Connection Site** to the **Restricted MW Export Level** as required by Paragraph 4.2A.2.1(c) (ignoring any export above **Restricted MW Export Level** where pursuant to an instruction from **The Company** to provide any **Balancing Service**(s)); and/or

(d) where no signal is received by the **User**'s **Circuit Breaker**(s) from the **System to Generator Operational Intertripping Scheme**.

4.2A.6 **Revisions to Appendix F3 of the Bilateral Agreement**

Where **The Company** requires **Routine Change(s)** (as defined below) to be made to Appendix F3 of the **Bilateral Agreement**, then

the **User** shall not unreasonably withhold or delay providing to **The Company** written consent to any such **Routine Changes** and hereby authorises **The Company**, following receipt of such written consent, to make amendments on its behalf to Appendix F3 of the **Bilateral Agreement** to reflect such **Routine Change(s)** and undertakes not to withdraw qualify or revoke such authority or instruction at any time. For the purposes of this Paragraph 4.2A.6, "**Routine Change(s)**" shall mean changes to the nomenclature of transmission circuits associated with a **System to Generator Operational Intertripping Scheme** specified in Appendix F3 of the relevant **Bilateral Agreement** which do not necessitate replacement, renovation, modification, alteration or construction to the **User**'s **Plant** or **Apparatus**.

4.2A.7 **No payments for Category 1 Intertripping Schemes**

For the avoidance of doubt, no payment shall be made by **The Company** hereunder in respect of a **Category 1 Intertripping Scheme**.

4.2B OTHER BALANCING SERVICES

4.2B.1 **Application**

The provisions of this Paragraph 4.2B shall apply to **The Company** and a **User** or other person in respect of the provision by that **User** or other person to **The Company** of **Balancing Services** other than **Mandatory Ancillary Services**, **Maximum Generation** and **System to Generator Operational Intertripping**.

4.2B.2 **Form of Agreement**

Any agreement between **The Company** and a **User** or other person in respect of the provision by that **User** or other person to **The Company** of **Balancing Services** other than **Mandatory Ancillary Services, Maximum Generation** and **System to Generator Operational Intertripping** shall be in a form to be agreed between them (but, in respect of **Commercial Services Agreements**, subject always to Paragraph 4.2B.3 where applicable).

4.2B.3 **Agreed Ancillary Services**

Each **User** and **The Company** shall enter into a **Commercial Services Agreement** providing for the payment for and provision of the **Agreed Ancillary Services** (other than **Maximum Generation**) and **System to Generator Operational Intertripping**) (if any) set out

in Appendix F1 of the relevant **Bilateral Agreement**. If, after a period which appears to **The Company** to be reasonable for the purpose, **The Company** has failed to enter into a **Commercial Services Agreement** with such **User**, **The Company** shall be entitled to initiate the procedure for resolution of the issue as an **Other Dispute** in accordance with Paragraph 7.4 to settle the terms of the said **Commercial Services Agreement**.

4.3 PAYMENTS FOR BALANCING SERVICES

4.3.1 Application

The provisions of this Paragraph 4.3 shall apply to payments made by **The Company** to a **User** (and by a **User** to **The Company**) pursuant to:-

4.3.1.1 **Mandatory Services Agreements** in respect of the provision of **Mandatory Ancillary Services**; and/or

4.3.1.2 (save as provided in Paragraphs 4.2.5.3 to 4.2.5.5 (inclusive)) **Maximum Generation Service Agreements** in respect of the provision of **Maximum Generation**; and/or

4.3.1.3 Paragraph 4.2A.4 in respect of the provision of **System to Generator Operational Intertripping**,

and (if agreed between **The Company** and a **User**) may also be incorporated by reference into a **Balancing Services Agreement** as a term thereof so as to apply in respect of the provision of other **Balancing Services** (but for the avoidance of doubt not so as to thereby create any obligations on **The Company** and that **User** under the **CUSC** in respect thereof).

4.3.2 Payment Procedure

4.3.2.1 On the third **Business Day** following receipt from the **Settlement Administration Agent** of the **Interim Information Settlement Run** issued in respect of the final day of the previous calendar month **The Company** shall send to the **User** a statement ("**Provisional Monthly Statement**") consisting of:-

(a) a statement ("**Provisional Statement**") incorporating:-

(i) detailed daily technical reports of all **Balancing Services** supplied by the **User** pursuant to the relevant **Balancing Services Agreement** during the previous calendar month;

(ii) a summary of each **Balancing Service** so supplied; and

(b) if relevant a statement showing adjustments to be made (net of interest) in relation to disputes for

Balancing Services concerning any month prior to the previous month ("**Provisional Adjustments Statement**"),

in each case showing the payments due to or from the **User** as a result thereof.

4.3.2.2 If the **User** has failed to supply any **Balancing Service** in accordance with the **Grid Code** or any instructions validly and properly issued under the **Grid Code** or as required by the **CUSC** or any **Balancing Services Agreement**, **The Company** shall set out the times and dates upon which it considers such failure of supply to have occurred and the facts or evidence which it relies upon as constituting such failure in the **Provisional Monthly Statement** next following the date of such failure or next following the date when **The Company** first becomes aware of the facts which constitute such failure.

4.3.2.3 If the **User** disagrees with any dates, times, facts or calculations set out in the **Provisional Statement** and/or the **Provisional Adjustments Statement**, it shall state by notice in writing to **The Company** the reasons and facts which it relies upon in support of such disagreement. The parties shall discuss and endeavour to resolve the matter prior to **The Company** sending out the **Final Monthly Statement**. If they reach agreement **The Company** shall set out in the **Final Monthly Statement** the adjustments required but if it cannot be resolved the dates times facts and calculations set out in the **Provisional Statement** and in the **Provisional Adjustments Statement** shall be binding upon the parties until such time as they are reversed or revised by agreement between the parties or otherwise (in accordance with Paragraph 4.3.2.8) pursuant to the **Dispute Resolution Procedure**.

4.3.2.4 Notwithstanding the provisions of Paragraphs 4.3.2.2 and 4.3.2.3, if any fact or matter set out in the **Provisional Statement** and/or in the **Provisional Adjustments Statement** shall be inconsistent with any fact or matter set out in a final run (if any) of the settlement calculation issued by the **Settlement Administration Agent**, or any change to a previous final run (if any) of a settlement calculation, the facts and matters set out in the settlement calculation or which, following a dispute and subject to Paragraph 4.3.2.5,

it is found or agreed should be set out therein shall be binding upon both parties.

4.3.2.5 If either **The Company** or the **User** intends to dispute any fact or matter contained in a final run (if any) of a settlement calculation which is inconsistent with any fact or matter contained in a **Provisional Statement** and/or a **Provisional Adjustments Statement** it shall serve notice in writing on the other party to that effect in order that the other party may make such representations as it wishes to the **Settlement Administration Agent** or exercise such rights as it may have under the **Balancing and Settlement Code** in relation to such fact or matter.

4.3.2.6 On the eighteenth **Business Day** of each calendar month, **The Company** shall send to the **User** a statement ("**Final Monthly Statement**") consisting of:-

(a) a statement ("**Final Statement**") incorporating:-

(i) in the case of an undisputed **Provisional Statement** (or where any dispute has been resolved and no changes have been effected to the calculations contained in the **Provisional Statement**) a further monthly summary of the **Balancing Services** provided together with an invoice for the amount shown as being due to the **User** or **The Company** (as the case may be); or

(ii) in the case of a disputed **Provisional Statement** such that changes are required as a result thereof, a further copy of the detailed daily technical reports referred to at Paragraph 4.3.2.1(a)(i), a revised monthly summary of the **Balancing Services** provided and an invoice for the amount shown as being due to the **User** or **The Company** (as the case may be); and

(b) if a **Provisional Adjustments Statement** has been issued in accordance with Paragraph 4.3.2.1(b), a statement ("**Final Adjustments Statement**") showing adjustments to be made in relation to disputes for **Balancing Services** concerning any month prior to the previous month together with interest thereon up to and including the date of payment referred to in Paragraph 4.3.2.10. Such adjustments will be

reflected in the invoice referred to at Paragraph 4.3.2.6(a)(i) above.

4.3.2.7 Where:-

(a) either **The Company** or the **User** discovers that any previous **Provisional Monthly Statement** or **Final Monthly Statement** contains an arithmetic error or omission; or

(b) any change is made to a previous final run (if any) of a settlement calculation which includes a change in any of the facts or matters upon which the final settlement run was based which facts or matters formed the basis upon which any previous **Provisional Monthly Statement** or **Final Monthly Statement** was prepared; or

(c) either **The Company** or the **User** becomes aware of any facts concerning matters provided by this Paragraph 4.3 (other than facts falling within Paragraphs 4.3.2.7(*a*) and (*b*)) which show that the payment made by or to the **User** was incorrect*;* or

(d) the **User** establishes to **The Company's** reasonable satisfaction that it was entitled to receive any additional payment;

then **The Company** and the **User** shall agree an adjustment to the account between **The Company** and the **User** which adjustment shall be reflected in the next **Provisional Adjustments Statement** which **The Company** issues, and the provisions of Paragraphs 4.3.2.3 to 4.3.2.5 shall apply mutatis mutandis to such adjustments. Failing agreement as to the amount of any such adjustment, **The Company** or the **User** may refer the matter to an expert for determination (if both of them agree) or otherwise may initiate the procedure for resolution of the issue as an **Other Dispute** in accordance with Paragraph 7.4.

4.3.2.8 Where a dispute is resolved by issuance of a decision by an expert or an arbitrator or panel of arbitrators pursuant to the **Dispute Resolution Procedure**, **The Company** shall adjust the account between itself and the **User** accordingly in the next **Provisional Adjustments Statement** required to be issued under Paragraph 4.3.2.1. If such decision of an

expert or an arbitrator or panel of arbitrators is subsequently reversed or modified by a final judicial decision after exhaustion of all appeals if this opportunity is taken, **The Company** shall adjust the account between itself and the **User** accordingly in the next **Provisional Adjustments Statement** which it issues.

4.3.2.9 Subject to Paragraph 4.3.2.13, the due date of payment for the purposes of Paragraph 4.3.2.12 in respect of any disputed amount subsequently determined or agreed to be payable to the **User** or to **The Company** shall be the date for payment of the relevant **Provisional Statement** from which the dispute arises.

4.3.2.10 **The Company** shall pay to the **User** the amount shown as due from **The Company** in the **Final Monthly Statement** within three **Business Days** of the date on which such statement is or should be issued. The **User** shall pay to **The Company** the amount shown as due from the **User** in such statement within three **Business Days** of the date on which such statement is issued.

4.3.2.11 If either party ("**Defaulting Party**"), in good faith and/or with reasonable cause fails to pay under Paragraph 4.3.2.10 any amount properly due in respect of **Balancing Services** under the **CUSC** and the relevant **Balancing Services Agreement**, then such **Defaulting Party** shall pay to the other party interest on such overdue amount from and including the due date of such payment to (but excluding) the date of actual payment (as well after as before judgment or determination by an arbitrator or panel of arbitrators) at the **Base Rate**. Provided that should the **Defaulting Party** otherwise fail to pay any amount properly due under the **CUSC** and the relevant **Balancing Services Agreement** on the due date then the **Defaulting Party** shall pay to the other party interest on such overdue amount at the **Enhanced Rate** from the due date on which such payment was properly due to (but excluding) the date of actual payment. Any interest shall accrue from day to day.

4.3.2.12 If following a dispute or by virtue of Paragraphs 4.3.2.2, 4.3.2.3, 4.3.2.4, 4.3.2.7 or 4.3.2.8 it is determined or agreed that the **User** was entitled to a further payment from **The Company**, the **User** shall be entitled to interest at the **Base Rate** on the amount of such further payment from the due

date calculated in accordance with Paragraph 4.3.2.9 until the date of payment.

4.3.2.13 If following a dispute or by virtue of the provisions of Paragraphs 4.3.2.2, 4.3.2.3, 4.3.2.4, 4.3.2.7 or 4.3.2.8 it is determined or agreed that **The Company** or the **User** was not entitled to any payment it has received, the other party shall be entitled to interest at the **Base Rate** on the amount so paid from the date of payment until the date of repayment or the date when **The Company** makes a payment to the **User** which takes such payment into account.

4.3.2.14 Notwithstanding any other provision of the **CUSC** and any **Balancing Services Agreement**, **The Company** and a **User** shall not be limited in any way as to the evidence they may rely upon in any proceedings arising out of or in connection with payment for any **Balancing Service** under the **CUSC** and the relevant **Balancing Services Agreement** and the parties agree that in the event and to the extent that either party succeeds in proving in any such proceedings that any **Balancing Service** was or was not provided, the successful party shall (without prejudice to any liquidated damages provision of the **CUSC** and/or the relevant **Balancing Services Agreement**) be entitled to repayment of the sums already paid or payment of sums not paid as the case may be in respect of such **Balancing Service**.

4.3.2.15 Save as otherwise expressly provided in the **CUSC** or in any **Balancing Services Agreement**, sums payable by **The Company** or a **User** to the other in respect of **Balancing Services** pursuant to the **CUSC** or any **Balancing Services Agreement** whether by way of charges, interest or otherwise shall (except to the extent otherwise required by law) be paid in full, free and clear of and without deduction, set-off or deferment in respect of any disputes or claims whatsoever save for sums the subject of a final award or judgement (after exhaustion of all appeals if this opportunity is taken) or which by agreement between **The Company** and the relevant **User** may be so deducted or set off.

4.3.2.16 **The Company** represents and warrants to each relevant **User**, as between **The Company** and that **User**, that it enters into each **Balancing Services Agreement** as principal and not as agent for any other person.

4.3.2.17 All amounts specified hereunder shall be exclusive of any **Value Added Tax** or other similar tax and **The Company** shall pay to the **User Value Added Tax** at the rate for the time being and from time to time properly chargeable in respect of the making available and/or supply of **Balancing Services** under the **CUSC**, the relevant **Balancing Services Agreement**, the **Grid Code**, or any **Bilateral Agreement**.

4.3.2.18 All payments by **The Company** to the **User** (or by the **User** to **The Company**) in respect of the provision of **Balancing Services** will be made by payment to the parties' bank accounts details of which may be set out in the relevant **Balancing Services Agreement** or otherwise notified by **The Company** to the **User** (or by the **User** to **The Company**) from time to time**.**

4.3.2.19 The submission of all **Provisional Monthly Statements** and all **Final Monthly Statements** and facts and other evidence in support thereof and any questions in connection therewith from **The Company** to the **User** and vice versa in accordance with this Paragraph 4.3.2 must be made, in the absence of agreement to the contrary between the parties, by 19.00 hours on the **Business Day** concerned.

4.3.2.20 For the purpose of the regulations of HM Revenue and Customs as regards self-billing of **Balancing Services** and the submission of **Value Added Tax** invoices, the **User** hereby consents to the operation of a self-billing system by **The Company** with regard to the payment for **Balancing Services** to be provided pursuant to the **CUSC** and the relevant **Balancing Services Agreement** and will at all times throughout the term of the relevant **Balancing Services Agreement** maintain such consent. The **User** hereby undertakes, as between **The Company** and that **User**, to do (at **The Company's** cost) all acts and things reasonably necessary to enable **The Company** to comply with the regulations of HM Customs and Excise as regards the self-billing of **Balancing Services**.

4.3.2.21 Payment of any sum or the submission of any **Provisional Monthly Statement** or **Final Monthly Statement** by **The Company** to a **User** under this Paragraph 4.3.2 shall not operate to impair or be construed as a waiver of any right, power, privilege or remedy **The Company** may have against the **User** under the **CUSC** and/or any **Balancing Services**

Agreement and/or the **Grid Code** and/or any **Bilateral Agreement**.

4.3.2.22 For the avoidance of doubt, **The Company** shall issue a **Provisional Monthly Statement** to the **User** for the calendar month following the calendar month in which any **Balancing Services Agreement** to which the **User** is a party shall expire or terminate, setting out details of the **Balancing Services** supplied by the **User** in respect thereof during that calendar month until expiry or termination, and in respect thereof the provisions of this Paragraph 4.3.2 shall continue to apply notwithstanding such expiry or termination.

4.4 CHARGING PRINCIPLES

4.4.1 Application

The provisions of this Paragraph 4.4 shall apply to payments made by **The Company** to a **User** pursuant to **Mandatory Services Agreements** in respect of the provision of the **Mandatory Ancillary Service** of **Frequency Response**, and (if agreed between **The Company** and a **User**) may also be incorporated by reference into any other **Ancillary Services Agreement** as a term thereof so as to apply in respect of payments made by **The Company** to that **User** in respect of the provision of other **Ancillary Services** (but for the avoidance of doubt not so as to thereby create any obligations on **The Company** and that **User** under the **CUSC** in respect thereof).

4.4.2 Charging Principles - General

4.4.2.1 These principles are to be used to establish the basic arrangements but are not intended to stifle innovation in the development of new services or the giving of appropriate economic signals.

4.4.2.2 Save where otherwise expressly provided in this Paragraph 4.4, the charges shall be "cost reflective" ie. based and founded upon the actual or estimated costs directly incurred or to be incurred by the **User** for the purpose of providing the service or capability concerned.

4.4.2.3 Where a capability to provide an **Ancillary Service** is required by the **Grid Code** from all **BM Units** or **CCGT Units** (as opposed to a capability made available by agreement between **The Company** and a **User** from some

only of the **User**'s **BM Units** or **CCGT Units**), no **Ancillary Service** capability payment shall be made.

4.4.2.4 The cost of "Grandfathering" **User**'s Equipment (i.e. bringing equipment owned by the **User** on 30th March 1990 to a condition of compliance with the **Grid Code**) shall not be included in **Ancillary Services** payments. Where a **Derogation** is withdrawn or reduced in scope then, except in relation to **Frequency Response**, the **User** shall be entitled to take the cost of meeting the withdrawal or reduction in the scope of the **Derogation** into account in its charges.

4.4.2.5 Subject to the other provisions of this Paragraph 4.4.2, the charges shall take due account of any change in or amendments to the **Grid Code** or any other statutory or regulatory obligation coming into force after 30th March 1990 affecting the provision of **Ancillary Services**.

4.4.2.6 If as a result of any changes to the **Balancing and Settlement Code** the **User** ceases to be entitled to receive payment under the **Balancing and Settlement Code** in respect of any elements of **Ancillary Services** provided by it which are expressed in this Paragraph 4.4 to be paid for under the **Balancing and Settlement Code**, the **User** shall be entitled to charge for such elements under an **Ancillary Services Agreement**. Where, however, such change entitles the **User** to be paid for any elements of **Ancillary Services** which are expressed in this Paragraph 4.4 to be paid for under an **Ancillary Services Agreement** the **User** shall cease to be entitled to charge for such elements under an **Ancillary Services Agreement**.

4.4.3 Charging Principles – Frequency Response

Holding Payments shall be determined in accordance with Paragraph 4.1.3.13 and, as specified in Paragraph 4.1.3.13(g), therefore need not be cost reflective.

4.4.3.1 Part-loading of a **BM Unit** at a level other than that specified in a **Physical Notification** in order to provide **Frequency Response** will normally be achieved by the issue of a **Bid-Offer Acceptance**.

4.4.3.2 In recognition of the energy production costs likely to be incurred or avoided when providing **Frequency Response**, an additional amount based upon an expected delivery of

Frequency Response energy shall be payable under Paragraph 4.1.3.9A.

4.5 INDEXATION

4.5.1 Application

The provisions of this Paragraph 4.5 shall apply to payments made by **NGC** to a **User** pursuant to Paragraphs 4.2A.4(a) and (c) in respect of the provision of **System to Generator Operational Intertripping**, and (if agreed between **The Company** and a **User**) may be incorporated by reference into any other **Balancing Services Agreement** (other than a **Mandatory Services Agreement**) as a term thereof so as to apply in respect of payments made by **The Company** to that **User** in respect of the provision of other **Balancing Services** (other than **Mandatory Ancillary Services**) (but for the avoidance of doubt not so as to thereby create any obligations on **The Company** and that **User** under the **CUSC** in respect thereof).

4.5.2 Indexation provisions

4.5.2.1 The rates and/or prices to be indexed shall be specified in the **Balancing Services Agreement** or (in the case of **System to Generator Operational Intertripping**) in Schedule 4 to this Section 4 as applicable for a 12 month period commencing 1st April ("the base year"), and these rates and/or prices will be adjusted annually to take account of general price inflation. The index used will be the Retail Prices Index (RPI) with 1987 = 100 base.

4.5.2.2 The source of the RPI index is to be the monthly Office for National Statistics "Business Monitor MM23."

4.5.2.3 The rates and/or prices to be indexed shall be increased (or reduced as appropriate) for the subsequent 12 month period commencing 1st April by the following factor:-

$$\frac{RPI_2}{RPI_1}$$

Where

RPI_2 is the RPI for March immediately prior to commencement of that 12 month period

RPI_1 is the RPI for March immediately prior to commencement of the base year.

4.5.2.4 The rates and/or prices to be indexed shall be increased (or reduced as appropriate) for the subsequent 12 month period commencing 1st April by the following factor:-

$$\frac{RPI_3}{RPI_1}$$

Where

RPI_3 is the RPI for March immediately prior to commencement of that 12 month period

RPI_1 is the RPI for March immediately prior to commencement of the base year.

4.5.2.5 In subsequent years indexation will continue in accordance with the above, with always the numerator of the factor representing the RPI of the 12 month period in question and the denominator of the factor being the RPI for March immediately prior to the base year.

4.5.2.6 In the event that RPI ceases to be published or is not published in respect of any relevant month or it is not practicable to use RPI because of a change in the method of compilation or some other reason, indexation for the purposes of this Paragraph 4.5 shall be calculated by **The Company** using an index agreed between **The Company** and the relevant **User** with a view to determining the relevant price after indexation that would be closest to the relevant price after indexation if RPI had continued to be available. If **The Company** and a relevant **User** are unable to agree a suitable index, either of them may initiate the **Dispute Resolution Procedure** for resolution of the issue as an **Other Dispute** in accordance with Paragraph 7.4.

4.5.2.7 For the avoidance of doubt, the provisions of Paragraph 11.3 with regard to determination of an alternative index should the **Retail Prices Index** not be published or there is a material change to the basis of such index shall not apply with respect to the rates and/or prices the subject of this Paragraph 4.5.

SCHEDULE 1

WEEKLY MAXIMUM GENERATION DECLARATION OF AVAILABILITY

[NAME OF GENERATOR] *Optional Logo*

Station .....*Telephone:*
Standby Tel:
Fax:
Standby Fax:

Maximum Generation shall be available for the week commencing [ ] from Maximum Generation BM Unit(s) as follows:-

Operational Day (dd/mm/yy)	**Maximum Generation BM Unit**	**Indicative Maximum Generation Capability**	**Available? (YES/NO)**

ADDITIONAL RELEVANT INFORMATION

Fax Sent By (Print name):

Signature: ..... Date: ..... Time: .....

Acknowledged by **The Company**:

Signature: ..... Date: ..... Time: .....

National Grid Control Centre	**Fax:**	**[ ]**
	Standby Fax:	**[ ]**

SCHEDULE 2

MAXIMUM GENERATION REDECLARATION OF AVAILABILITY

[NAME OF GENERATOR] *Optional Logo*

Station .....*Telephone:*
Standby Tel:
Fax:
Standby Fax:

The availability of Maximum Generation is revised as follows:

OPERATIONAL DAY (dd/mm/yy)	Maximum Generation BM Unit	Indicative Maximum Generation Capability	Available (YES/NO)

ADDITIONAL RELEVANT INFORMATION

Fax Sent By (Print name):

Signature: ..... Date: ..... Time: .....

Acknowledged by **The Company**:

Signature: ..... Date: ..... Time: .....

National Grid Control Centre	**Fax:**	**[ ]**
	Standby Fax:	**[ ]**

SCHEDULE 3

SYSTEM TO GENERATOR OPERATIONAL INTERTRIPPING - FACSIMILE FORMS

Part I

Instruction to arm and disarm System to Generator Operational Intertripping Scheme

From: [ ]

To: [ ]

Time and date instruction issued: [ ]

Category of Intertrip	
Connection Site	
Time and date of arming	
Restricted MW Export Level (MW) post trip	
Special instructions (if any)	
Reason(s) for arming	
Relevant fault(s)	
Generating Unit(s)/BM Unit(s)/Intertrip Contacted Unit(s) to be armed (delete as appropriate)	
Anticipated duration of arming	

Section 4 - INDICATIVE DRAFTING CAP169

Category of Intertrip	
Connection Site	
Time and date of arming	

Part II

Confirmation of Withdrawal of Restricted MW Export Level

From : [ ]

To: [ ]

Time and date confirmation issued: [ ]

Connection Site	
Restricted MW Export Level (MW)	
No longer applies	*Tick if applicable*
Has been increased to (MW)	

Special instructions (if any) if Restricted MW Export Level has been increased	

SCHEDULE 4

SYSTEM TO GENERATOR OPERATIONAL INTERTRIPPING - PAYMENT RATES

	Category 1	Category 2	Category 3	Category 4
Capability Payment (£/Settlement Period)	N/A	£ 1.72	N/A	£ 1.72
Intertrip Payment (£/Intertrip Contracted Unit/Trip)	N/A	£ 400,000	N/A	£ 400,000

All rates in this Schedule 4 are specified at April 2005 base and shall be subject to indexation in accordance with Paragraph 4.5 with effect from 1st April 2006.

END OF SECTION 4

INDICATIVE DRAFTING RELATING TO CAP169

CUSC - SECTION 11 - INTERPRETATION AND DEFINITIONS

"**DC Converter**"	as defined in the **Grid Code**;
"**Network Operator**"	as defined in the **Grid Code**;
"**Power Park Unit**"	as defined in the **Grid Code**;
"**Power Station**"	as defined in the **Grid Code;** ~~an installation comprising one or more **Generating Units** (even where sited separately) owned and/or controlled by the same **Generator**, which may reasonably be considered as being managed as one **Power Station**;~~
"Pre-Connection Reactive Despatch Network Restriction"	**with respect to any Embedded Generating Unit, Embedded Power Park Module or DC Converter at an Embedded DC Converter Station, a Reactive Despatch Network Restriction notified to The Company pursuant to the Grid Code prior to the Commissioning Programme Commencement Date for such Embedded Generating Unit, Embedded Power Park Module or DC Converter;**
"Reactive Despatch Network Restriction"	as defined in the **Grid Code**;

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"	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;
"Relevant Zone"	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;
"Under-excitation Limiter"	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.

INDICATIVE DRAFTING RELATING TO CAP169

CUSC – SCHEDULE 3

CONTENTS

Part II Not Used

SCHEDULE 3

BALANCING SERVICES

Part I

Balancing Services Market Mechanisms - Reactive Power

1 Definitions and Interpretations

1.1 For the purpose of this Part I and the Appendices, "**Obligatory Reactive Power Service**" means the **Mandatory Ancillary Service** referred to in **Grid Code CC** 8.1 which the relevant **User** is obliged to provide (for the avoidance of doubt, as determined by any direction in force from time to time and issued by the **Authority** relieving a relevant **User** from the obligation under its **Licence** to comply with such part or parts of the **Grid Code** or any **Distribution Code** or, in the case of **The Company**, the **Transmission Licence** as may be specified in such direction) in respect of the supply of **Reactive Power** (otherwise than by means of synchronous or static compensation except in the case of a **Power Park Module** where synchronous or static compensation within the **Power Park Module** may be used to provide **Reactive Power**) and in respect of the required **Reactive Power** capability referred to in **Grid Code CC** ~~6.3.2, which~~6.3.2. This **Mandatory Ancillary Service** shall comprise, in relation to a **Generating Unit**, **DC Converter** or **Power Park Module**, compliance by the relevant **User** in all respects with all provisions of the **Grid Code** applicable to it relating to that supply of **Reactive Power** and required **Reactive Power** capability, together with the provision of such despatch facilities (including the submission to **The Company** of all relevant technical, planning and other data in connection therewith) and metering facilities (meeting the requirements of Appendix 4), and upon such terms, as shall be set out in a **Mandatory Services Agreement** entered into between **The Company** and the relevant **User**.

For the avoidance of doubt, "**Obligatory Reactive Power Service**" when used in this Part I and the Appendices excludes provision of **Reactive Power** capability from **Synchronous Compensation** and from static compensation equipment (except in the case of a **Power Park Module** where synchronous or static compensation within the **Power Park Module** may be used to provide **Reactive Power**), and the production of **Reactive Power** pursuant thereto.

1.2 For the purpose of this Part I and the Appendices, "**Enhanced Reactive Power Service**" means the **Commercial Ancillary Service** of:-

(a) the provision of **Reactive Power** capability of a **Generating Unit**, **DC Converter** or **Power Park Module** in excess of that which a **User** is obliged to provide from that **Generating Unit**, **DC Converter** or **Power Park Module**, under and in accordance with the **Connection Conditions** of the **Grid Code** and the production of **Reactive Power** pursuant thereto, which a **User** may agree to provide and which is capable of being made available to, and utilised by, **The Company** in accordance with the **Balancing Codes** of the **Grid Code** (or as may otherwise be agreed in writing between **The Company** and a **User**) for the purposes of voltage support on the **GB Transmission System**, upon and subject to such terms as may be agreed in writing between **The Company** and such **User**; or

(b) the provision of **Reactive Power** capability from **Synchronous Compensation** or from static compensation equipment (except in the case of a **Power Park Module** where Grid Code CC8.1 specifies that such **Reactive Power** capability is a **Mandatory Ancillary Service**), and the production of **Reactive Power** pursuant thereto, which a **User** or any other person may agree to provide and which is capable of being made available to, and utilised by, **The Company** for the purposes of voltage support on the **GB Transmission System**, upon and subject to such terms as may be agreed in writing between **The Company** and such **User** or other person; or

(c) such other provision or enhancement of capability of **Plant** and/or **Apparatus** or other equipment to generate or absorb **Reactive Power**, and the production of **Reactive Power** pursuant thereto, which a **User** or any other person may agree to provide and which is capable of being made available to, and utilised by, **The Company** for the purposes of voltage support on the **GB Transmission System**, upon and subject to such terms as may be agreed in writing between **The Company** and such **User** or other person.

1.3 Unless otherwise defined in the **CUSC**, terms and expressions found in the **Grid Code** have the same meanings, interpretations and constructions in this Part I and the Appendices.

1.4 In this Part I and the Appendices, except where the context otherwise requires, references to a particular Appendix, Part, Section, sub-section, Paragraph or sub-Paragraph shall be a reference to a particular Appendix

to or part of this Part I or, as the case may be, that Section, sub-section, Paragraph or sub-Paragraph in this Part I.

2. Obligatory Reactive Power Service – Default Payment Arrangements

2.1 Notwithstanding any other provision of the **CUSC**, the provisions of this Part I and the Appendices, together with the **Mandatory Services Agreements** referred to in sub-Paragraph 2.6, shall govern the rights and obligations of **The Company** and relevant **Users** with respect to payments to be made by **The Company** to such **Users** for the provision of the **Obligatory Reactive Power Service**.

2.2 Subject always to Paragraph 3, and notwithstanding the provisions of any **Ancillary Services Agreement** now or hereafter in effect (but subject always to sub-Paragraph 4.2), the payments to be made by **The Company** to **Users** for the provision of the **Obligatory Reactive Power Service** in all **Mandatory Services Agreements** under which **Users** are or will be paid for the **Obligatory Reactive Power Service** shall, subject always to sub-Paragraph 2.7, comprise solely payments for utilisation determined in respect of each **Settlement Period** in accordance with sub-Paragraph 2.3.

2.3 Save to the extent and for the duration of any **Market Agreement** (as defined in sub-Paragraph 3.1) which may be entered into between **The Company** and a **User** as referred to in Paragraph 3 the utilisation payment for provision of the **Obligatory Reactive Power Service** shall be determined in accordance with the provisions of Appendix 1.

2.4 The Parties acknowledge and agree that, as at 1st October 1997:-

(a) the totality of payments for the provision of the **Obligatory Reactive Power Service**, determined in accordance with the provisions of this Paragraph 2, reflect so far as reasonably practicable the overall variable costs (on the basis of the charging principles set out in Appendix 7) incurred across all relevant **Generating Units** of the provision of the **Obligatory Reactive Power Service** (whether or not payments are made in respect of those **Generating Units** pursuant to this Paragraph 2 or pursuant to **Market Agreements** entered into in accordance with Paragraph 3); and

(b) such totality of payments will continue to reflect those overall variable costs notwithstanding all and any variations thereto reasonably anticipated at such date.

2.5 It is hereby agreed and acknowledged that nothing in this Part I and the Appendices shall affect in any way the obligation on each **User** to comply with the provisions of the **Grid Code** insofar as they relate to **Reactive Power**. For the avoidance of doubt, and without limiting the foregoing, it is hereby agreed and acknowledged that, notwithstanding that the payments for the **Obligatory Reactive Power Service** shall comprise solely payments for utilisation, nothing in this Part I and the Appendices shall relieve **Users** from the obligations to comply with the provisions of the **Grid Code** in relation to **Reactive Power** by virtue of Paragraph 6.3.3 of the **CUSC** or otherwise howsoever.

2.6 **Mandatory Services Agreements** have been and will continue to be entered into bilaterally between **The Company** and **Users** but it is intended that, subject as provided below, **Mandatory Services Agreements** between **The Company** and **Users** providing the **Obligatory Reactive Power Service** will be amended or (if not in existence when this Part I takes effect) concluded so as to give effect to the provisions of sub-Paragraphs 2.2 and 2.3. Subject always to sub-Paragraphs 2.8 and 4.2, **The Company** and each relevant **User** therefore agree, as soon as reasonably practicable, to amend the existing **Mandatory Services Agreement** or conclude a new **Mandatory Services Agreement** in respect of each relevant **Generating Unit** , **DC Converter** or **Power Park Module**, in order to give effect to the provisions of sub-Paragraphs 2.2 and 2.3.

2.7 For the avoidance of doubt, no payments referred to in this Paragraph 2 shall be payable by **The Company** to a **User** in relation to any **Generating Unit**, **DC Converter** or **Power Park Module**, unless and until the relevant **Mandatory Services Agreement** is so amended or concluded as provided in sub-Paragraph 2.6.

2.8 Notwithstanding the foregoing provisions of this Paragraph 2, and without prejudice to Paragraph 5, **The Company** shall only be obliged to amend or conclude any **Mandatory Services Agreement** with regard to any **Generating Unit** , **DC Converter** or **Power Park Module**, if:-

(a) either:-

~~(a)~~ (i) the leading or lagging **Reactive Power** capability required of that **Generating Unit**, **DC Converter** or **Power Park Module**, in accordance with **Grid Code CC** 6.3.2 (or, where the **Generating Unit**, **DC Converter** or **Power Park Module** is **Derogated Plant** of an **Embedded Exemptable Large Power Station**, the level to which, it has been **Derogated**) is 15Mvar or more (measured at the **Commercial Boundary**); ~~and~~ or

(ii) that **Generating Unit**, **DC Converter** or **Power Park Module** is at or comprises a **Large Power Station** where such required capability is less than 15Mvar (measured at the **Commercial Boundary**) and the **User** requests **The Company** in writing to so amend or conclude a **Mandatory Services Agreement** with respect thereto; and

(b) there exists in relation to that **Generating Unit**, **DC Converter** or **Power Park Module**, metering facilities meeting the requirements of Appendix 4.

3. Obligatory Reactive Power Service and Enhanced Reactive Power Service – Market Payment Mechanism

3.1 Nothing in this Part I and the Appendices, and nothing in any **Mandatory Services Agreement** entered into or amended in accordance with sub-Paragraph 2.6, shall prevent or restrict:-

(a) the entering into of an **Ancillary Services Agreement** or the amendment of any **Mandatory Services Agreement** between **The Company** and any **User** to provide for the making of payments by **The Company** to that **User** for the provision of the **Obligatory Reactive Power Service** on an alternative basis to that set out or referred to in Paragraph 2; or

(b) the entering of an **Ancillary Services Agreement** between **The Company** and any **User** (or other person) for the provision of an **Enhanced Reactive Power Service**,

and any such agreement so entered into in accordance with the principles contained in sub-Paragraph 3.3 is referred to in this Part I and the Appendices as a "**Market Agreement**".

3.2 The coming into effect of a **Market Agreement** in relation to any **Generating Unit**, **DC Converter** or **Power Park Module** shall, in respect of that **Generating Unit**, **DC Converter** or **Power Park Module**, suspend and replace for the duration thereof the provisions for payment for the **Obligatory Reactive Power Service** (if applicable) set out or referred to in Paragraph 2. In such a case, and for the avoidance of doubt, with effect from the expiry or termination of the **Market Agreement**, the provisions for payment for the **Obligatory Reactive Power Service** set out or referred to in Paragraph 2 shall in relation to that **Generating Unit**, **DC Converter** or **Power Park Module**, cease to be suspended and shall resume full force and effect.

3.3 The following principles shall govern the entering into of **Market Agreements**:-

(a) *Relevant Dates*

(i) Each **Market Agreement** will commence on either 1st April or 1st October, whichever next follows the submission by **The Company** of the package of information as more particularly described in sub-Paragraph 3.3(b)(i) ("**Contract Start Days**").

(ii) For the purposes of this sub-Paragraph 3.3:-

(a) a "**Market Day**" shall be a date not earlier than twenty weeks and not later than sixteen weeks prior to a **Contract Start Day**; and

(b) a "**Tender Period**" shall be a period of at least eight consecutive weeks commencing on a date nominated by **The Company** and ending on a **Market Day**.

(b) *Submission of **Tender** information by **The Company***

(i) **The Company** shall, acting reasonably and having regard to the principles contained in this sub-Paragraph 3.3, compile a package of information for the use of interested parties comprising technical, procedural and contractual requirements, directions and specifications to govern **Market Agreements** to take effect from the following **Contract Start Day**. **The Company** shall ensure that such requirements, directions and specifications do not conflict with any of the principles contained in this sub-Paragraph 3.3 and so far as reasonably practicable do not discriminate between **Tenderers**.

(ii) Prior to the commencement of each **Tender Period**, **The Company** shall provide to all persons who shall by then have requested the same the package of information as more particularly described in sub-Paragraph 3.3(b)(i).

(c) *Submission of **Tenders***

During the **Tender Period**, but for the avoidance of doubt not later than the **Market Day**, an interested party may submit to **The Company**:-

(i) in relation to any **Generating Unit**, **DC Converter** or **Power Park Module** providing the **Obligatory Reactive Power Service**, prices for and **Tendered Capability Breakpoints** relating to the provision thereof; or

(ii) in relation to that **Generating Unit**, **DC Converter** or **Power Park Module**, a tender for provision of the **Enhanced Reactive Power Service** specified in sub-Paragraph 1.2(a) and/or (b) and/or (c); and/or

(iii) in relation to any other **Generating Unit**, **DC Converter** or **Power Park Module** or other **Plant and Apparatus** (or other equipment), a tender for provision of the **Enhanced Reactive Power Service** specified in sub-Paragraph 1.2(b) and/or (c),

in each case in accordance with sub-Paragraph 3.3(d). All such submissions are referred to in this Part I and the Appendices as "**Tenders**", and "**Tenderers**" shall be construed accordingly.

(d) *Form of **Tenders***

(i) All **Tenders** submitted by **Users** which comprise:-

(a) prices for and **Tendered Capability Breakpoints** relating to the provision of the **Obligatory Reactive Power Service**; and

(b) terms for the provision of the **Enhanced Reactive Power Service** specified in sub-Paragraph 1.2(a),

shall be completed on the basis that payment will be determined in respect of each **Settlement Period** in accordance with the formulae and other provisions set out in Appendix 2 and in the manner set out in Appendix 5.

(ii) All other **Tenders** (including without limitation those comprising terms for the provision of the **Enhanced Reactive Power Service** specified in sub-Paragraphs 1.2(b) and (c)) shall be submitted in accordance with and on the basis of such (if any) reasonable directions given by **The Company** in the package of information referred to in sub-Paragraph 3.3(b)(i) or otherwise in such manner as may be reasonably specified by **The Company** from time to time, which directions shall in either case be, so far as reasonably

practicable, consistent with the provisions of Appendices 2 and 5.

(iii) Each **Tender** comprising prices for and **Tendered Capability Breakpoints** relating to the provision of the **Obligatory Reactive Power Service** shall be submitted on the basis that **The Company** may only select all (and not some) of the prices and **Tendered Capability Breakpoints** comprised therein.

(iv) Save where expressly provided otherwise in a **Tender**, each **Tender** comprising terms for the provision of an **Enhanced Reactive Power Service** shall be treated as having been submitted on the basis that **The Company** may select all or part only of the **Reactive Power** capability comprised therein (which, in the case of the **Enhanced Reactive Power Service** specified in sub-Paragraph 1.2(a), shall mean all or part only of the excess capability comprised therein).

(v) All **Tenders** shall be submitted in respect of periods of whole and consecutive calendar months, to be not less than twelve months and in multiples of six months, to commence on the next following **Contract Start Day**. Save where expressly provided otherwise in a **Tender**, a **Tender** (whether in relation to the **Obligatory Reactive Power Service** or an **Enhanced Reactive Power Service**) shall be treated as having been submitted on the basis that **The Company** may select all or part only of any period so tendered (in multiples of six months), subject to a minimum period of twelve consecutive months, commencing on the next following **Contract Start Day**.

(e) *Qualification and Evaluation of **Tenders***

(i) Each **Tender** must satisfy the mandatory qualification criteria set out in Section A of Appendix 6.

(ii) **The Company** shall evaluate and (without prejudice to sub-Paragraphs 3.3(d)(iii), (iv) and (v)) select **Tenders** (or part(s) thereof) on a basis consistent with its obligations under the **Act** the **Transmission Licence** and the **CUSC** and, subject thereto, in accordance with the evaluation criteria set out in Section B of Appendix 6. Without limitation, **The Company** reserves the right to require tests of a **Generating Unit**, **DC Converter** or **Power Park Module** or other **Plant** and

Apparatus (or other equipment), on a basis to be agreed with a **Tenderer**, as part of the evaluation of a **Tender**.

(iii) **The Company** shall use reasonable endeavours to evaluate **Tenders** within ten weeks from each **Market Day**.

(f) *Entering into **Market Agreements***

(i) Having selected a **Tender** (or part(s) thereof) in accordance with sub-Paragraph 3.3(e), **The Company** shall notify the relevant **Tenderer** that it wishes to enter into a **Market Agreement** in respect thereof, and that **Tenderer** and **The Company** shall each use reasonable endeavours to agree the terms of, and enter into a **Market Agreement** in respect thereof as soon as reasonably practicable but in any event not later than 4 weeks prior to the relevant **Contract Start Day**. Notwithstanding the foregoing, if a **Market Agreement** has not been entered into by the date being 4 weeks prior to the relevant **Contract Start Day**, then either **The Company** or the **Tenderer** shall be entitled, provided that it shall have used all reasonable endeavours to agree the terms of, and enter into, the **Market Agreement** as aforesaid, to notify the other that it no longer wishes to enter into the **Market Agreement**, whereupon the **Tender** in question shall be deemed to be withdrawn.

(ii) In the event of a deemed withdrawal of a **Tender** in the circumstances set out in sub-Paragraph 3.3(f)(i), **The Company** shall be entitled to re-evaluate and select all or part of any outstanding **Tenders** in accordance with sub-Paragraphs 3.3(e)(i) and (ii) and to notify one or more **Tenderers** if, in substitution for the **Tender** so deemed to be withdrawn, it wishes to enter into a **Market Agreement** in respect of any other **Tender** or **Tenders** (or part(s) thereof). Following such notification, **The Company** and each **Tenderer** in question shall use reasonable endeavours to agree the terms of, and enter into, a **Market Agreement** prior to the relevant **Contract Start Day**.

(iii) If, in respect of any **Tender**, a **Market Agreement** is not entered into by the relevant **Contract Start Day**, that **Tender** shall be deemed to be withdrawn.

(iv) Save where otherwise provided in this Paragraph 3, all **Market Agreements** must be entered into on the basis of

the terms set out in the relevant **Tender** (or relevant part(s) thereof).

(g) *Legal Status of **Tenders***

For the avoidance of doubt, a **Tender** shall not constitute an offer open for acceptance by **The Company**, and in respect of any **Tender** (or part(s) thereof) selected by **The Company** pursuant to sub-Paragraph 3.3(e) or (f), neither the **Tenderer** in question nor **The Company** shall be obliged to provide or pay for the **Obligatory Reactive Power Service** and/or an **Enhanced Reactive Power Service** upon the terms of that **Tender** (or the relevant part(s) thereof) unless and to the extent that those terms are incorporated in a **Market Agreement** subsequently entered into.

(h) *Publication*

(i) Within the six weeks following each **Contract Start Day**, **The Company** shall provide to all persons requesting the same the following information:-

(a) in respect of all **Market Agreements** then subsisting, prices and contracted **Reactive Power** capability on an individual **Tender** basis relating to the period from the immediately preceding **Contract Start Day** until the next following **Contract Start Day**;

(b) in respect of all **Mandatory Services Agreements** and **Market Agreements** subsisting in respect of the six month period ending on the immediately preceding **Contract Start Day**, details of utilisation of Mvarh provided by individual **BM Units** (or, where relevant, other **Plant** and/or **Apparatus** or other equipment) pursuant to the **Obligatory Reactive Power Service** and **Enhanced Reactive Power Service**;

(c) details of the circumstances surrounding any failure by **The Company** during the preceding six month period to perform any of its duties and responsibilities under this Paragraph 3 in the circumstances referred to in Paragraph 5; and

(d) any other information reasonably considered by **The Company** to be pertinent to the **Tender** process,

and, to this extent, each relevant **User** consents to the disclosure by **The Company** of the information referred to in sub-sub-Paragraphs (a) and (b) above in so far as it relates to the provision of the **Obligatory Reactive Power Service** and (where applicable) an **Enhanced Reactive Power Service** from its **Generating Units**, **DC Converters** or **Power Park Modules** and/or other **Plant** and **Apparatus** (or other equipment).

(ii) Without prejudice to the provision of information pursuant to sub-Paragraph 3.3(h)(i), **The Company** further agrees to use all reasonable endeavours to provide to all persons requesting the same, within the six weeks following each **Contract Start Day**, estimates of the Mvarh absorption and generation by the **GB Transmission System**, where used for the purposes of voltage support, during the preceding six month period.

4. Amendment and Conclusion of Mandatory Services Agreements

4.1 **The Company** and each relevant **User** shall promptly do all such acts and execute and deliver such agreements and other documentation as may be necessary to amend or conclude the relevant **Mandatory Services Agreements** so as to give effect to the provisions of this Part I and the Appendices as amended from time to time.

4.2 Sub-Paragraphs 2.6 and 4.1 shall not require **The Company** or any **User** to amend or conclude a **Mandatory Services Agreement** so as to give effect to this Part I and the Appendices if and to the extent that, in respect of any **Generating Unit**, **DC Converter** or **Power Park Module**, **The Company** and such **User** shall have expressly agreed in writing that no payments shall be made by **The Company** to such **User** under an **Ancillary Services Agreement** for the provision of the **Obligatory Reactive Power Service** from that **Generating Unit**, **DC Converter** or **Power Park Module** (as the case may be).

5. Statutory and Regulatory Obligations

5.1 Neither **The Company** nor any **User** shall be bound to perform any of its duties or responsibilities under this Part I and the Appendices (including without limitation with regard to the amending or concluding of **Mandatory Services Agreements** in accordance with sub-Paragraph 2.6 and the entering into of **Market Agreements** in accordance with Paragraph 3) if and to the extent that to do so would be likely to involve that party in breach of its duties and obligations (if any) under the **Act** of or any condition of a **Licence**. Accordingly, nothing in this Part I and the

Appendices shall preclude **The Company** from procuring the provision of any **Enhanced Reactive Power Service** in a manner otherwise than in accordance with Paragraph 3 in order to comply with its duties and obligations under the **Act** and/or any condition of the **Transmission Licence** to the extent such compliance cannot reasonably be assured by the performance of its duties and responsibilities under Paragraph 3.

5.2 Without prejudice to sub-Paragraph 5.1, **The Company** shall not be bound to comply with the provisions of sub-Paragraph 3.3(h) with regard to the disclosure of information to the extent that to do so would be likely to restrict, distort or prevent competition in the provision of the **Obligatory Reactive Power Service** and/or **Enhanced Reactive Power Service**.

6. Redundant Provisions

Certain redundant provisions of Schedule 5 to the **MCUSA** with respect to capability payments comprised within the default payment arrangements and matters for review which were applicable on and from 1 October 1997 but are of no continuing effect by effluxion of time or otherwise, together with other provisions contained elsewhere in this Part I and the Appendices which, prior to the **CUSC Implementation Date**, included reference to such provisions, are set out (or, as the case may be, repeated) for information purposes only in Appendix 9.

APPENDIX 1

Obligatory Reactive Power Service – Default Payment Arrangements

The provisions of this Appendix 1, as referred to in sub-Paragraph 2.2 of this Part I, shall apply to the calculation of default payments for provision of the **Obligatory Reactive Power Service** from **BM Units**. All payments shall be expressed in pounds sterling.

1. **Total Payment**

Total Payment (PT) = PU *[£ per **Settlement Period** per **BM Unit**]*

where, subject always to paragraphs 5 and 6 below:

PU = the utilisation payment in respect of a **BM Unit** for a **Settlement Period** determined in accordance with paragraph 2 below.

2. **Utilisation Payment**

PU = $BP_U * U$ *[£ per **Settlement Period** per **BM Unit**]*

Where

BP_U = $\frac{46{,}270{,}000*I*X}{42{,}054{,}693}$ *[£/Mvarh]*

Where

I = defined in paragraph 3 below;

X = 1 (unless the circumstances in sub-paragraphs (a) through to ~~(d)~~ **(e)** apply)

And where X shall be 0.2 in all **Settlement Periods** from (and including) that in which:-

(a) the relevant **BM Unit** (or, in relation to a **CCGT Module**, any relevant **CCGT Unit**) fails a **Reactive Test** until (and including) the **Settlement Period** in which a subsequent **Reactive Test** is passed in relation to that **BM Unit** (or **CCGT Unit** (as the case may be)); or

(b) the **User** fails (other than pursuant to an instruction given by **The Company** or as permitted by the **Grid Code**) to set the automatic voltage regulator of the **BM Unit** (or, in relation to a **CCGT Module**, any relevant **CCGT Unit**) to a voltage following mode until (and including) the **Settlement Period** in which the **User** notifies **The Company** that the automatic voltage regulator is so set; or

(c) the **BM Unit** fails to comply with a **Reactive Despatch Instruction** due to the fact that the **BM Unit** (or, in relation to a **CCGT Module**, any relevant **CCGT Unit**) is unable to increase and/or decrease its Mvar output (other than as a direct result of variations in **System** voltage) until (and including) the **Settlement Period** in which the **User** notifies **The Company** that the **BM Unit** is so able to comply; or

(d) the **BM Unit** fails to have a Mvar range which includes the ability to provide zero Mvar at the **Commercial Boundary** until (and including) the **Settlement Period** in which the **User** notifies **The Company** that the **BM Unit** has or once more has such range; ~~and~~ or

(e) a **Pre-Connection Reactive Despatch Network Restriction** affects the relevant **BM Unit** until (and including) the **Settlement Period** in which notification is given to **The Company** pursuant to the **Grid Code** that such **Pre-Connection Reactive Despatch Network Restriction** is no longer affecting that **BM Unit**; and

U = defined in Section 1 of Appendix 3

3. Indexation

3.1 The indexation factor I used in the formulae in paragraph 2 above shall be determined as follows:-

(a) For all periods up to (and including) 31st March, 2004, I shall with effect from 1st April in respect of each subsequent 12 month period ending 31st March be determined as follows:-

$$I = \frac{RP1_2}{RP1_1}$$

where

For the period from (and including) 1st October, 1997 to (and including) 31st March, 1998 RPI_2 =155.4, and thereafter RPI_2 is the RPI for March of the immediately preceding twelve month period ending 31st March.

RPI_1 is the RPI for March, 1994 (142.5).

~~3.2~~

(b) For all periods from (and including) 1st April, 2004, I shall in respect of each calendar month be determined as follows:-

$I = I_m$

where

I_m = the indexation factor I for the calendar month in question

$I_m = C*[(0.5*FRPI_m/RPI_x)+(0.5*PI_m)]$

where

$C = RPI_x/RPI_1$

RPI_x is the RPI for March, 2003 (179.9)
RPI_1 is as defined in sub-paragraph (a) above
$FRPI_m$ is the Forecast RPI for the calendar month in question

and where PI_m is a wholesale power price index determined as follows:-

$PI_m = [(p* HPI_m/HPI_1) + (q* PAPI_m/PAPI_1) + (r* PPI_m/PPI_1)$

Where

HPI_m is the mean average of the OTC baseload month ahead Heren power index bid and offer prices for all days on which this index is published in the calendar month immediately preceding the calendar month in question

$PAPI_m$ is the mean average of the OTC baseload month ahead Petroleum Argus power index bid and offer prices for all days on which this index is published in the calendar month immediately preceding the calendar month in question

PPI_m is the mean average of the OTC baseload month ahead Platts power index bid and offer prices for all days on which this index is published in the calendar month immediately preceding the calendar month in question

and where

p = 1/3 (subject always to sub-paragraph 3.2 (c)
q = 1/3 (subject always to sub-paragraph 3.2(c)

r = 1/3 (subject always to sub-paragraph 3.2(c)

and where

HPI_1 is the mean average of the OTC baseload month ahead Heren power index bid and offer prices for all days on which this index is published during the period from (and including) 1st October 2002 to (and including) 30th September 2003

$PAPI_1$ is the mean average of the OTC baseload month ahead Petroleum Argus power index bid and offer prices for all days on which this index is published during the period from (and including) 1st October 2002 to (and including) 30th September 2003

PPI_1 is the mean average of the OTC baseload month ahead Platts power index bid and offer prices for all days on which this index is published during the period from (and including) 1st October 2002 to (and including) 30th September 2003

3.2 For the purposes of sub-paragraph 3.1 above:-

(a) the RPI Index used is the **Retail Price Index** with 1987 = 100 base, and the source of the RPI Index is the monthly Office for National Statistics "Business Monitor MM23";

(b) Forecast RPI is as provided monthly by Experian Business Strategies Ltd; and

(c) if in respect of any calendar month the mean average of any of the power indices more particularly referred to in sub-paragraph 3.1(b) is incapable of being derived and/or there is a material change in the basis of that power index, then subject as provided below, for the purpose of sub-paragraph 3.1(b) **The Company** shall determine the wholesale power price index PI_m for that calendar month by substituting for the original value of factor p,q, or r as relates to that power index ("the Affected Factor") the value of zero, and by substituting for the original value of each of the remaining factors p, q, or r a value which is increased from the original value by a pro rata proportion of the original value of the Affected Factor. Provided always that if in respect of any calendar month the mean average of each of such power indices is incapable of being derived and/or there is a material change in the basis of each such power index, then **The Company** shall determine the wholesale power price index PI_m for that calendar month by substituting for the value PI_m in the determination of I_m the value $FRPI_m/RPI_x$.

4. **Information Unavailable**

Save where otherwise provided in this Part I, where any information or data required by **The Company** for the calculation of payments to be made pursuant to this Part I is not available to **The Company** at the relevant time, **The Company** shall calculate payments using **The Company's** best estimate of the unavailable information of data. Once such information or data is available, **The Company** shall accordingly make all consequential adjustments to the payments from itself to **Users** as soon as reasonably practicable thereafter to reflect any repayment or additional payment so required to be made by one party to the other in respect of the relevant period (including interest thereon at the **Base Rate** from the original date of payment or due date (as the case may be) until the date of such repayment or additional payment).

5. **Commissioning**

5.1 Save in relation to **BM Units** operational prior to 1st April, 1997 no utilisation payments referred to in this Appendix 1 shall fall due and payable to any **User** in respect of any **BM Unit** until the **Settlement Period** in which it is demonstrated to the reasonable satisfaction of **The Company**, having regard to industry practice, that the **BM Unit** (or, in the case of a **CCGT Module**, but subject always to sub-paragraph 5.4 below, each relevant **CCGT Unit**) complies with the provisions of **Grid Code CC** 6.3.2 and **CC** 6.3.4 or (where **The Company** in its sole discretion requires **Reactive Power** from a **BM Unit** before then for the purposes of security of the **GB Transmission System**) such earlier date as **The Company** may agree with a **User** in respect of that **BM Unit**.

5.2 Before any demonstration of compliance referred to in sub-paragraph 5.1 above, it shall be necessary for the **User** to demonstrate to **The Company's** reasonable satisfaction, having regard to industry practice, that the **BM Unit**'s (or, in the case of a **CCGT Module**, each relevant **CCGT Unit**'s) **Excitation System**, and in particular the under–excitation limiter, or in the case of a **Power Park Module** or **DC Converter**, the continuously acting automatic voltage control system required to provide control of the voltage or zero transfer of **Reactive Power**, has been successfully commissioned and complies with the provisions of **Grid Code CC** 6.3.8.

5.3 For the avoidance of doubt the issue by **The Company** in relation to a **BM Unit** of a **Reactive Despatch Instruction** to unity power factor or zero Mvar shall neither imply by itself that **The Company** is reasonably satisfied with compliance as referred to in sub-paragraph 5.1 above nor imply in relation to the **BM Unit** agreement by **The Company** of an earlier date as also referred to therein.

5.4 Until such time as it shall be demonstrated to the reasonable satisfaction of **The Company** that, in relation to a **CCGT Module**, all relevant **CCGT Units** comply with the provisions of **Grid Code CC** 6.3.2 and **CC** 6.3.4 as referred to in sub-paragraph 5.1 above, it is the intention that utilisation payments shall fall due to

a **User** in respect of that **CCGT Module** notwithstanding the provisions of sub-paragraph 5.1 above. For such period, and in relation to that **CCGT Module**, only, this Appendix 1 and the definitions of QC and QR set out in Appendix 3 shall be read and construed accordingly.

6. **De-energisation and Disconnection**

Subject to all rights and obligations of **The Company** and the **User** accrued at such date, utilisation payments referred to in this Appendix 1 shall cease to fall due and payable to any **User** in respect of any **BM Unit** with effect from the date of expiry or termination for whatever reason of the relevant **Mandatory Services Agreement** in accordance with its terms or (if earlier) with effect from the date of **De-energisation** or **Disconnection** of that **BM Unit** for any reason pursuant to the relevant **Bilateral Agreement** or the **CUSC**.

Appendix 2

Obligatory Reactive Power Service and Enhanced Reactive Power Services – Market Payment Mechanism

The provisions of this Appendix 2, as referred to in sub-Paragraph 3.3(d)(i) of this Part I, shall apply to the calculation of payments in respect of **Tenders** comprising prices for and **Tendered Capability Breakpoints** relating to the **Obligatory Reactive Power Service** and in respect of **Tenders** comprising terms for the provision of the **Enhanced Reactive Power Services** specified in sub-Paragraph 1.2(a) of this Part I, in each case in respect of **BM Units**. All payments shall be expressed in pounds sterling. All algebraic terms contained in this Appendix 2 shall bear the meanings set out in paragraph 1 below unless the context otherwise requires.

1. **Definitions**

For the purposes of this Appendix 2, unless the context otherwise requires, the following terms shall have the following meanings:-

CA1,CA2 and CA3	=	the available capability prices (expressed to apply to both leading and lagging) (£/Mvar/h) (as more particularly described in paragraph 2 of Appendix 5) as specified in the relevant **Market Agreement**;
CS1,CS2 and CS3	=	the synchronised capability prices (expressed to apply to both leading and lagging) (£/Mvar/h) (as more particularly described in paragraph 2 of Appendix 5) as specified in the relevant **Market Agreement**;
CU1,CU2 and CU3	=	the utilisation prices (expressed to apply to both leading and lagging) (£/Mvarh) (as more particularly described in paragraph 2 of Appendix 5) as specified in the relevant **Market Agreement**;
K	=	in respect of **CCGT Modules** and **Power Park Modules**, the relevant configuration factor as specified in the relevant **Market Agreement**, otherwise 1;
Q_{lead}	=	defined in Section 2 of Appendix 3;
Q_{lag}	=	defined in Section 2 of Appendix 3;

QM_{ij}	=	**BM Unit Metered Volume** (as defined in the **Balancing and Settlement Code**);
Q1, Q2 and Q3	=	the contracted capability breakpoints (expressed to apply to both leading and lagging) in whole Mvar as may be specified in the relevant **Market Agreement**, where:

(i) Q1 = TQ1,
Q2 = TQ2
and Q3 = QC
where TQ2< QC≤TQ3

(ii) Q1 = TQ1,
Q2 = QC
Q3 = null
where TQ1 < QC≤TQ2

(iii) Q1 = QC,
Q2 = null
Q3 = null
where 0≤ QC≤TQ1

SPD	=	the duration of a **Settlement Period**, being 0.5;
TQ1, TQ2 and TQ3	=	defined in Appendix 5;
U_{lead}	=	defined in Section 1 of Appendix 3;
U_{lag}	=	defined in Section 1 of Appendix 3;
V	=	the system voltage range performance factor (expressed to apply to both leading and lagging) as calculated in accordance with the formulae set out in the relevant **Market Agreement**, otherwise 1;
$MEL_i(t)$	=	**Maximum Export Limit** (as defined in the **Balancing and Settlement Code**).

2. **Total Payment**

Total Payment (PTM) = PUM + PCA + PCS *[£ per **Settlement Period** per **BM Unit**]*

where, subject always to paragraphs 6, 7 and 8 below:

PUM = the utilisation payment in respect of a **BM Unit** for a **Settlement Period** determined in accordance with paragraph 3 below;

PCA = the available capability payment in respect of a **BM Unit** for a **Settlement Period** determined in accordance with paragraph 4 below; and

PCS = the synchronised capability payment in respect of a **BM Unit** for a **Settlement Period** determined in accordance with paragraph 5 below.

Provided always that PTM shall be 0 in all **Settlement Periods** from and including that in which:-

(a) the relevant **BM Unit** (or, in relation to a **CCGT Module**, any relevant **CCGT Unit**) fails a **Reactive Test** or a **Contract Test** until (and including) the **Settlement Period** in which a subsequent **Reactive Test** or **Contract Test** (as the case may be) is passed in relation to that **BM Unit** (or **CCGT Unit** (as the case may be)); or

(b) the **User** fails (other than pursuant to an instruction given by **The Company** or as permitted by the **Grid Code**) to set the automatic voltage regulator of the **BM Unit** (or, in relation to a **CCGT Module**, any relevant **CCGT Unit**) to a voltage following mode until (and including) the **Settlement Period** in which the **User** notifies **The Company** that the automatic voltage regulator is so set; or

(c) the **BM Unit** fails to comply with a **Reactive Despatch Instruction** due to the fact that the **BM Unit** (or, in relation to a **CCGT Module**, any relevant **CCGT Unit**) is unable to increase and/or decrease its Mvar **Output** (other than as a direct result of variations in **System** voltage) until (and including) the **Settlement Period** in which the **User** notifies **The Company** that the **BM Unit** is so able to comply; or

(d) the **BM Unit** fails to have a Mvar range which includes the ability to provide zero Mvar at the **Commercial Boundary** until (and including) the **Settlement Period** in which the **User** notifies **The Company** that the **BM Unit** has or once more has such range; or

(e) a **Pre-Connection Reactive Despatch Network Restriction** affects the relevant **BM Unit** until (and including) the **Settlement Period** in which notification is given to **The Company** pursuant to the **Grid Code** that such **Pre-Connection Reactive Despatch Network Restriction** is no longer affecting that **BM Unit**.

3 Utilisation Payment

3.1 For each **Settlement Period**,

$PUM = PUM_{lead} + PUM_{lag}$ *[£ per **Settlement Period** per **BM Unit**]*

where

PUM_{lead} = defined in sub-paragraph 3.2 below;

PUM_{lag} = defined in sub-paragraph 3.3 below.

3.2 Leading Utilisation (PUM_{lead})

There are four mutually exclusive cases (a), (b), (c) or (d):

(a) If $Q2_{lead} < (U_{lead}/SPD)$ and both $Q2_{lead}$ and $Q3_{lead}$ are not deemed null
(i.e. there are three breakpoints)

then $PUM_{lead} = SPD * [(CU1_{lead} * Q1_{lead}) + (CU2_{lead} * (Q2_{lead} - Q1_{lead})) + (CU3_{lead} * ((U_{lead}/SPD) - Q2_{lead}))]$

(b) If

either $Q1_{lead} < (U_{lead}/SPD) \leq Q2_{lead}$ and $Q2_{lead}$ is not deemed null
(i.e. there are <u>at least</u> two breakpoints)

or $Q2_{lead} < (U_{lead}/SPD)$ and $Q2_{lead}$ is not deemed null and Q3 is deemed null
(i.e. there are <u>only</u> two breakpoints)

then $PUM_{lead} = SPD * [(CU1_{lead} * Q1_{lead}) + (CU2_{lead} * ((U_{lead}/SPD) - Q1_{lead}))]$

(c) If

either $0 < (U_{lead}/SPD) \leq Q1_{lead}$
(i.e. irrespective of the number of breakpoints)

or $Q1_{lead} < (U_{lead}/SPD)$ and $Q2_{lead}$ and $Q3_{lead}$ are deemed null
(i.e. there is only one breakpoint)

then $PUM_{lead} = CU1_{lead} * U_{lead}$

(d) otherwise

$PUM_{lead} = 0$ *[£ per **Settlement Period** per **BM Unit**]*

3.3 Lagging Utilisation (PUM_{lag})

There are four mutually exclusive cases (a), (b), (c) or (d):

(a) If $Q2_{lag} < (U_{lag}/SPD)$ and both $Q2_{lag}$ and $Q3_{lag}$ are not deemed null
(i.e. there are three breakpoints)

then $PUM_{lag} = SPD * [(CU1_{lag} * Q1_{lag}) + (CU2_{lag} * (Q2_{lag} – Q1_{lag})) + (CU3_{lag} * ((U_{lag}/SPD) – Q2_{lag}))]$

(b) If

either $Q1_{lag} < (U_{lag}/SPD) \leq Q2_{lag}$ and $Q2_{lag}$ is not deemed null
(i.e. there are <u>at least</u> two breakpoints)

or $Q2_{lag} < (U_{lag}/SPD)$ and $Q2_{lag}$ is not deemed null and Q3 is deemed null
(i.e. there are <u>only</u> two breakpoints)

then $PUM_{lag} = SPD * [(CU1_{lag} * Q1_{lag}) + (CU2_{lag} * ((U_{lag}/SPD) – Q1_{lag}))]$

(c) If

either $0 < (U_{lag}/SPD) \leq Q1_{lag}$
(i.e. irrespective of the number of breakpoints)

or $Q1_{lag} < (U_{lag}/SPD)$ and $Q2_{lag}$ and $Q3_{lag}$ are deemed to be null
(i.e. there is <u>only</u> one breakpoint)

then $PUM_{lag} = CU1_{lag} * U_{lag}$

(d) otherwise

$PUM_{lag} = 0$ *[£ per **Settlement Period** per **BM Unit**]*

4 <u>Available Capability Payment</u>

4.1 For each **Settlement Period**,

where at any time $MEL_i(t) > 10MW$

then $PCA = K^* ((V_{lead} * PCA_{lead}) + (V_{lag} * PCA_{lag}))$

otherwise

$PCA = 0$ *[£ per **Settlement Period** per **BM Unit**]*

where

PCA_{lead} = defined in sub-paragraph 4.2 below;

PCA_{lag} = defined in sub-paragraph 4.3 below.

4.2 Available Leading Capability (PCA_{lead})

There are four mutually exclusive cases (a), (b), (c) or (d):

(a) If $Q2_{lead} < Q_{lead} \leq Q3_{lead}$ and both $Q2_{lead}$ and $Q3_{lead}$ are not deemed null
(i.e. there are three breakpoints)

then $PCA_{lead} = SPD * [(CA1_{lead} * Q1_{lead}) + (CA2_{lead} * (Q2_{lead} – Q1_{lead})) + (CA3_{lead} * (Q_{lead} – Q2_{lead}))]$

(b) If $Q1_{lead} < Q_{lead} \leq Q2_{lead}$ and $Q2_{lead}$ is not deemed null
(i.e. there are <u>at least</u> two breakpoints)

then $PCA_{lead} = SPD * [(CA1_{lead} * Q1_{lead}) + (CA2_{lead} * (Q_{lead} – Q1_{lead}))]$

(c) If $0 < Q_{lead} \leq Q1_{lead}$
(i.e. irrespective of the number of breakpoints)

then $PCA_{lead} = SPD * CA1_{lead} * Q_{lead}$

(d) otherwise

$PCA_{lead} = 0$ *[£ per **Settlement Period** per **BM Unit**]*

4.3 Available Lagging Capability (PCA_{lag})

There are four mutually exclusive cases (a), (b), (c) or (d):

(a) If $Q2_{lag} < Q_{lag} \leq Q3_{lag}$ and $Q2_{lag}$ and $Q3_{lag}$ are not deemed null
(i.e. there are three breakpoints)

then $PCA_{lag} = SPD * [(CA1_{lag} * Q1_{lag}) + (CA2_{lag} * (Q2_{lag} – Q1_{lag})) + (CA3_{lag} * (Q_{lag} – Q2_{lag}))]$

(b) If $Q1_{lag} < Q_{lag} \leq Q2_{lag}$ and $Q2_{lag}$ is not deemed null
(i.e. there are <u>at least</u> two breakpoints)

then $PCA_{lag} = SPD * [(CA1_{lag} * Q1_{lag}) + (CA2_{lag} * (Q_{lag} – Q1_{lag}))]$

(c) If $0 < Q_{lag} \leq Q1_{lag}$
(i.e. irrespective of the number of breakpoints)

then $PCA_{lag} = SPD * CA1_{lag} * Q_{lag}$

(d) otherwise

$PCA_{lag} = 0$ *[£ per **Settlement Period** per **BM Unit**]*

5. <u>Synchronised Capability Payment</u>

5.1 For each **Settlement Period**,

where $QM_{ij} > 5MWh$

$PCS = K* ((V_{lead} * PCS_{lead}) + (V_{lag} * PCS_{lag}))$

Otherwise

$PCS = 0$ *[£ per **Settlement Period** per **BM Unit**]*

where

PCS_{lead} = defined in sub-paragraph 5.2 below;

PCS_{lag} = defined in sub-paragraph 5.3 below.

5.2 Synchronised Leading Capability (PCS_{lead})

There are four mutually exclusive cases (a), (b), (c) and (d):

(a) If $Q2_{lead} < Q_{lead} \leq Q3_{lead}$ and $Q2_{lead}$ and $Q3_{lead}$ are not deemed null
(i.e. there are three breakpoints)

then $PCS_{lead} = SPD * [(CS1_{lead} * Q1_{lead}) + (CS2_{lead} * (Q2_{lead} – Q1_{lead})) + (CS3_{lead} * (Q_{lead} – Q2_{lead}))]$

(b) If $Q1_{lead} < Q_{lead} \leq Q2_{lead}$ and $Q2_{lead}$ is not deemed null
(i.e. there are <u>at least</u> two breakpoints)

then $PCS_{lead} = SPD * [(CS1_{lead} * Q1_{lead}) + (CS2_{lead} * (Q_{lead} – Q1_{lead}))]$

(c) If $0 < Q_{lead} \leq Q1_{lead}$
(i.e. irrespective of the number of breakpoints)

then $PCS_{lead} = SPD * CS1_{lead} * Q_{lead}$

(d) otherwise

$PCS_{lead} = 0$ *[£ per **Settlement Period** per **BM Unit**]*

5.3 Synchronised Lagging Capability (PCS_{lag})

There are four mutually exclusive cases (a), (b), (c) or (d):

(a) If $Q2_{lag} < Q_{lag} \leq Q3_{lag}$ and $Q2_{lag}$ and $Q3_{lag}$ are not deemed null
(i.e. there are three breakpoints)

then $PCS_{lag} = SPD * [(CS1_{lag} * Q1_{lag}) + (CS2_{lag} * (Q2_{lag} – Q1_{lag})) + (CS3_{lag} * (Q_{lag} – Q2_{lag}))]$

(b) If $Q1_{lag} < Q_{lag} \leq Q2_{lag}$ and $Q2_{lag}$ is not deemed null
(i.e. there are <u>at least</u> two breakpoints)

then $PCS_{lag} = SPD * [(CS1_{lag} * Q1_{lag}) + (CS2_{lag} * (Q_{lag} – Q1_{lag}))]$

(c) If $0 < Q_{lag} \leq Q1_{lag}$
(i.e. irrespective of the number of breakpoints)

then $PCS_{lag} = SPD * CS1_{lag} * Q_{lag}$

(d) otherwise

$PCS_{lag} = 0$ *[(£ per **Settlement Period** per **BM Unit**]*

6. Testing

The Company reserves the right to require to be included in any **Market Agreement**, on a basis to be agreed with a **Tenderer**, terms with regard to the carrying out of a **Contract Test**. The provisions of **Grid Code OC** 5.5.1 relating to the carrying out of a **Reactive Test** (including re-tests) shall apply to the carrying out of **Contract Tests**.

7. Termination

Save where expressly provided otherwise in a **Tender**, each **Market Agreement** shall contain terms entitling **The Company** to terminate that **Market Agreement** in the event that the **User** fails to provide a satisfactory level of service and entitling the **User** to terminate the **Market Agreement** in the event that **The Company** fails (without reasonable cause) to make due payment to the **User**, in each case as more particularly defined therein.

8. De-energisation and Disconnection

Subject to all rights and obligations of **The Company** and the **User** accrued at such date, utilisation, available capability and synchronised capability payments referred to in this Appendix 2 shall cease to fall due and payable to any **User** in respect of any **BM Unit** with effect from the date of expiry or termination for whatever reason of the relevant **Market Agreement** in accordance with its terms or (if earlier) with effect from the date of **De-energisation** or **Disconnection** of that **BM Unit** for any reason pursuant to the relevant **Bilateral Agreement** or the **CUSC**.

Appendix 3

Technical Data

Section 1
Reactive Utilisation Data

This Section 1 of Appendix 3 specifies the technical data to be used to determine the utilisation payments to be made in accordance with Appendix 1 and Appendix 2. For the purposes thereof, the following terms shall have the following meanings:-

U_{lead} = leading Mvarh produced by the relevant **BM Unit** at the **Commercial Boundary** in the relevant **Settlement Period** measured by metering meeting the requirements of Appendix 4 and as specified in the relevant **Mandatory Services Agreement** and/or **Market Agreement** where the **User** has complied with a **Reactive Despatch Instruction** in accordance with **Grid Code BC** 2, otherwise 0;

U_{lag} = lagging Mvarh produced by the relevant **BM Unit** at the **Commercial Boundary** in the relevant **Settlement Period** measured by metering meeting the requirements of Appendix 4 and as specified in the relevant **Mandatory Services Agreement** and/or **Market Agreement** where the **User** has complied with a **Reactive Despatch Instruction** in accordance with **Grid Code BC** 2, otherwise 0;

U = the total Mvarh (leading and lagging)

where

$U = U_{lead} + U_{lag}$ *[Mvarh per **Settlement Period** per **BM Unit**]*

For the avoidance of doubt, leading Mvarh shall mean Mvarh imported by the **BM Unit** at the **Commercial Boundary** irrespective of the direction of **Active Power** flow, and lagging Mvarh shall mean Mvarh exported by the **BM Unit** at the **Commercial Boundary** irrespective of the direction of **Active Power** flow.

Section 2
Reactive Power Capability Data and Redeclarations

This Section 2 of Appendix 3 specifies the technical data to be used to determine the capability payments to be made in accordance with Appendix 2.

1. For the purposes thereof, the following terms shall have the following meanings:-

Q_{lead} = min (QR_{lead}, QC_{lead}) *[Mvar]*

Q_{lag} = min (QR_{lag}, QC_{lag}) *[Mvar]*

where

QC = as specified in the relevant **Mandatory Services Agreement** and/or **Market Agreement**, being either (1) the high voltage value (specified in whole Mvar) equivalent at the **Commercial Boundary** to the low voltage Mvar capability (leading or lagging) of the relevant **BM Unit** as described in paragraph 2 below, or (2) where applicable, the high voltage Mvar capability (leading or lagging) of the relevant **BM Unit** as described in paragraph 2 below, in each case representing the capability to supply continuously leading or lagging Mvar (as the case may be);

QR = as determined in accordance with the relevant **Mandatory Services Agreement** and/or **Market Agreement**, being, in relation to a **Settlement Period**, either (1) the high voltage value (specified in whole Mvar) equivalent to the redeclared low voltage Mvar capability (leading or lagging) or (2) the redeclared high voltage Mvar capability (leading or lagging), in each case of the relevant **BM Unit** (or, in the absence of such redeclaration, such high voltage value reasonably determined by **The Company** as a result of monitoring and/or testing as provided in the relevant **Mandatory Services Agreement** and/or **Market Agreement**), and QR_{lead} and QR_{lag} shall be construed accordingly.

2. (a) In respect of capability payments made in accordance with Appendix 1:-

(i) QC shall be the low voltage (or high voltage, as the case may be) capability required to ~~provide~~be provided under and in accordance with the **Connection Conditions** of the **Grid Code** (where applicable, as determined by any direction in force from time to time and issued by the **Authority** relieving the relevant **User** from the

obligation under its **Licence** to comply with such part or parts of the **Grid Code** as may be specified therein); and

(ii) QC and QR shall represent the high voltage (or high voltage value equivalent) capability (or redeclared capability) at **Rated MW** at the **Commercial Boundary**.

(b) In respect of capability payments made pursuant to a **Market Agreement** in accordance with Appendix 2:-

(i) QC shall be the capability required to be provided under and in accordance with the **Connection Conditions** of the **Grid Code** or, where the **Market Agreement** is in respect of a **Tender** for terms for the provision of the **Enhanced Reactive Power Service** specified in sub-Paragraph 1.3(a) of this Part I, a capability agreed to be provided in excess of that required under and in accordance with the **Connection Conditions** of the **Grid Code** but so that in such a case QC cannot exceed TQ3 (defined in Appendix 5);

(ii) QC shall represent the high voltage value equivalent at a nominated **Registered Capacity** specified by a **Tenderer** in the **Tender** at the **Commercial Boundary** within the system voltage range specified in the relevant **Market Agreement**; and

(iii) QR shall represent the high voltage value equivalent at the then current **Registered Capacity** at the **Commercial Boundary** within the system voltage range specified in the relevant **Market Agreement**.

(c) For the purposes of this Section 2, the figures for QC and QR shall be determined in a manner consistent with the principles and methodologies set out in a document published or to be published from time to time by **The Company** for this purpose.

For the avoidance of doubt, leading capability shall mean the ability to import **Reactive Power** at the **Commercial Boundary** irrespective of the direction of **Active Power** flow, and lagging capability shall mean the ability to export **Reactive Power** at the **Commercial Boundary** irrespective of the direction of **Active Power** flow.

Appendix 4
Metering

1 Balancing and Settlement Code

For the avoidance of doubt, nothing in this Appendix shall affect the rights and obligations of **The Company** and those **Users** also bound by the **Balancing and Settlement Code** by virtue of being a party to the **BSC Framework Agreement** with regard to **Metering Equipment** and **Metering Systems** insofar as such provisions relate to **Reactive Energy**.

2. BM Units

2.1 For the purposes of this Part I and the Appendices, subject always to sub-paragraph 2.2, the quantities of Mvarh imported and exported by a **BM Unit** shall be derived from the relevant **Metering System** for that **BM Unit** registered pursuant to Section K of the **Balancing and Settlement Code**.

2.2 Where the existing **Metering System** for the **BM Unit** registered pursuant to Section K of the **Balancing and Settlement Code** does not incorporate **Metering Equipment** capable of measuring and recording Mvarh imports and exports for that **BM Unit** for each **Settlement Period**, then the relevant **User** shall register or procure that there is registered pursuant to Section K of the **Balancing and Settlement Code** a **Metering System** which does incorporate such **Metering Equipment**.

2.3 All relevant **Metering Equipment** identification and location codes shall be set out in the relevant **Mandatory Services Agreement**, and the **User** hereby agrees to facilitate agreement between **The Company** and that **User** with respect thereto by providing **The Company** as soon as reasonably practicable following request with all necessary supporting diagrams and other written documentation.

2.4 Where the configuration of the **Metering System** is such that:-

2.4.1 Mvarh import and export values for the **BM Unit** are not measured at the **Commercial Boundary**; and/or

2.4.2 Mvarh import and export values for the **BM Unit** are measured by more than one **Meter**; and/or

2.4.3 the Mvarh import and export values for the **BM Unit** are measured by a **Meter** which also measures the Mvarh import and export values of one or more other **Generating Units**, **DC Converters**, **Power Park Modules**, **Plant** and **Apparatus** or other equipment,

then appropriate loss adjustment factors and aggregation methodologies (as the case may be) shall be used to determine on a **Settlement Period** basis the Mvarh import value and Mvarh export value for the relevant **BM Unit** at the **Commercial Boundary** to be used for the purposes of this Part I.

The appropriate factors and methodologies for each relevant **BM Unit** shall be agreed by **The Company** and each relevant **User** (both acting reasonably) in the relevant **Mandatory Services Agreement** by adoption of one or more of the factors or methodologies set out in the document entitled "Methodology Document for the Aggregation of Reactive Power Metering" (as amended from time to time) published by **The Company** for this purpose. This document shall specify the respective factors and methodologies to be applied for particular **Metering System** configurations in order to determine so far as reasonably practicable the Mvarh import value and Mvarh export value for the relevant **BM Unit** at the **Commercial Boundary** as required by this sub-paragraph ~~2.4~~2.4.

3. Other Plant and/or Apparatus (or other equipment)

In all other cases not covered by paragraph 2, unless otherwise agreed in writing by The Company, the following provisions shall apply:-

3.1 The quantities of Mvarh imported and exported shall be measured and recorded through **Meters** complying with all relevant **Codes of Practice** to the extent applying to **Reactive Energy**, which shall include without limitation those relating to calibration, testing and commissioning.

3.2 Such **Meters** shall be capable of providing a Mvarh import and export value for each **Settlement Period** for each item of **Plant** and/or **Apparatus** or other equipment.

3.3 Such **Meters** shall be situated as close as reasonably practicable to the **Commercial Boundary** taking into account relevant financial considerations.

3.4 The principles set out in paragraph 2.4 in relation to adjustment and aggregation shall apply.

3.5 For the purposes of remote interrogation the relevant **Mandatory Services Agreement** shall include appropriate terms with regard to the provision and maintenance of all communication links.

CUSC Schedule 3 - INDICATIVE DRAFTING RELATING TO CAP169

INDICATIVE DRAFTING RELATING TO CAP169

Appendix 5
Submission of Tenders

The provisions of this Appendix 5 specify the manner in which **Users** shall complete **Tenders** comprising prices and **Tendered Capability Breakpoints** relating to the **Obligatory Reactive Power Service** and terms for the provision of the **Enhanced Reactive Power Service** specified in sub-Paragraph 1.3 (a) of this Part I, in each case in respect of **BM Units**.

A **Tender** shall include (inter alia) details of the **Reactive Power** range, the prices tendered for utilisation and capability and an indexation mechanism as set out below. Each **Tender** must relate to one **BM Unit** only. **Users** wishing to tender in relation to more than one **BM Unit** must therefore submit separate **Tenders** for each **BM Unit**.

1. Reactive Power Capability

1.1 In respect of each **BM Unit**, a **Tenderer** must nominate a **Registered Capacity** which it anticipates will be the actual **Registered Capacity** on the **Contract Start Day** for that **BM Unit** (in this Appendix 5 referred to as "**Nominated Registered Capacity**") to be used for the duration of the **Market Agreement**. All capability data used for the purpose of a **Tender** must be expressed as the capability of a **BM Unit** at the **Commercial Boundary** and must represent the value of **Reactive Power** output which can be supplied continuously at the **Commercial Boundary** when the **BM Unit** is operating at the **Nominated Registered Capacity**.

1.2 In respect of each **BM Unit**, all capability data relating to the provision of the **Enhanced Reactive Power Service** specified in sub-Paragraph 1.2(a) of this Part I must be expressed as the capability of that **BM Unit** at the **Commercial Boundary** across a system voltage range to be specified by the **Tenderer** in its **Tender** (or otherwise in accordance with directions given by **The Company**).

1.3 All **Reactive Power** capability data in respect of a **BM Unit** must be expressed as positive, whole numbers in Mvar, with leading and lagging capability data distinguished by the subscripts $_{lead}$ and $_{lag}$.

1.4 In respect of each **BM Unit**, and subject to any directions issued from time to time by **The Company** with regard to such values, the **User** must submit at least one **Reactive Power** capability value and may in addition submit up to a further two **Reactive Power** capability values (all three being "**Tendered Capability Breakpoints**"), for both leading and lagging Mvar. One of these **Tendered Capability Breakpoints**, in respect of both leading and lagging Mvar, must be equivalent to the minimum **Reactive Power** capability of a **BM Unit** which a **User** is obliged to provide under and in accordance with the **Connection Conditions** of the **Grid Code** (to the nearest whole Mvar) after application of the principles

set out in sub-paragraphs 1.2 and 1.3 above and as further described in the package of information referred to in sub-Paragraph 3.3(b)(i) of this Part I.

1.5 The **Tendered Capability Breakpoints** shall be defined for the purposes of this Appendix as TQ1, TQ2, TQ3, for leading and lagging Mvar as the case may be, where:-

$$TQ3_{lead} > TQ2_{lead} > TQ1_{lead} > 0$$

and $$TQ3_{lag} > TQ2_{lag} > TQ1_{lag} > 0$$

1.6 Where only two **Tendered Capability Breakpoints** are tendered, for leading or lagging Mvar as the case may be, then the value of TQ3 shall be deemed to be null for the purposes of calculating payments for capability and utilisation and no additional payments for capability will fall due and payable in respect of a **BM Unit** for the provision of **Reactive Power** capability above **Tendered Capability Breakpoint** TQ2.

1.7 Where only one **Tendered Capability Breakpoint** is tendered, for leading or lagging Mvar as the case may be, then the values of TQ2 and TQ3 shall be deemed to be null for the purposes of calculating payments for capability and utilisation and no additional payments for capability will fall due and payable in respect of a **BM Unit** for the provision of **Reactive Power** capability above **Tendered Capability Breakpoint** TQ1.

1.8 The **Reactive Power** capability value at zero Mvar (referred to in paragraph 2 below as Q0) shall be treated as a **Tendered Capability Breakpoint** for the purposes of tendering capability and utilisation prices and calculating capability and utilisation payments.

2. Prices

In respect of each **Tendered Capability Breakpoint**, prices submitted by **Users** must be zero or positive, quoted in pounds sterling to the nearest tenth of a penny and shall otherwise be tendered as described in sub-paragraphs 2.1, 2.2 and 2.3 below. The prices shall be described using the following notation:-

$C1_{lag}$ is the price applicable between **Tendered Capability Breakpoints** Q0 and $TQ1_{lag}$ including $TQ1_{lag}$

$C2_{lag}$ is the price applicable between **Tendered Capability Breakpoints** $TQ1_{lag}$ and $TQ2_{lag}$ including $TQ2_{lag}$

$C3_{lag}$ is the price applicable between **Tendered Capability Breakpoints** $TQ2_{lag}$ and $TQ3_{lag}$ including $TQ3_{lag}$

$C1_{lead}$ is the price applicable between **Tendered Capability Breakpoints** Q0 and $TQ1_{lead}$ including $TQ1_{lead}$

$C2_{lead}$ is the price applicable between **Tendered Capability Breakpoints** $TQ1_{lead}$ and $TQ2_{lead}$ including $TQ2_{lead}$

$C3_{lead}$ is the price applicable between **Tendered Capability Breakpoints** $TQ2_{lead}$ and $TQ3_{lead}$ including $TQ3_{lead}$

where C shall represent CU, CA or CS as the case may be.

2.1 Utilisation Prices (CU)

(a) Utilisation prices submitted by **Users** must be:-

(i) quoted in units of £/Mvarh; and

(ii) no greater than £999.999/Mvarh.

(b) Utilisation prices must increase across the **Reactive Power** capability range, for leading or lagging Mvar as the case may be, such that:-

$CU3_{lead} \geq CU2_{lead} \geq CU1_{lead} \geq 0$

$CU3_{lag} \geq CU2_{lag} \geq CU1_{lag} \geq 0$

(c) Utilisation payments shall be made for metered **Reactive Power** output and shall be calculated in accordance with Appendix 2.

2.2 Available Capability Prices (CA)

(a) Available capability prices submitted by **Users** must be:-

(i) quoted in units of £/Mvar/h; and

(ii) no greater than £999.999/Mvar/h.

(b) Available capability prices must increase across the **Reactive Power** capability range, for leading or lagging Mvar as the case may be, such that:-

$CA3_{lead} \geq CA2_{lead} \geq CA1_{lead} \geq 0$

$CA3_{lag} \geq CA2_{lag} \geq CA1_{lag} \geq 0$

(c) Available capability payments shall be calculated in accordance with Appendix 2

2.3 Synchronised Capability Prices (CS)

(a) Synchronised capability prices submitted by **Users** must be:-

(i) quoted in units of £/Mvar/h; and

(ii) no greater than £999.999/Mvar/h.

(b) Synchronised capability prices must increase across the **Reactive Power** capability range, for leading or lagging Mvar as the case may be, such that:-

$CS3_{lead} \geq CS2_{lead} \geq CS1_{lead} \geq 0$

$CS3_{lag} \geq CS2_{lag} \geq CS1_{lag} \geq 0$

(c) Synchronised capability payments shall be calculated in accordance with Appendix 2.

3. Indexation

Where a **Tender** is submitted in respect of a period which exceeds the minimum twelve month period required by sub-Paragraph 3.3(d)(v) of this Part I, then the **User** shall submit one mechanism for calculating indexation on an annual basis which shall apply to all prices submitted in the **Tender** for all subsequent periods of twelve months following the minimum twelve month period to which the **Tender** applies. Such mechanism shall be based on either the Retail Prices Index (as referred to in paragraph 3 of Appendix 1), a fixed percentage (which may be positive, zero or negative) or a summation of such Retail Prices Index and such fixed percentage.

4. Other Technical Information

A **User** shall submit with a **Tender** such other technical information as reasonably directed by **The Company** in accordance with sub-Paragraph 3.3 (b)(i) of this Part I. Such information may include (without limitation):-

4.1 in relation to a **Tender** for the **Enhanced Reactive Power Service** specified in sub-Paragraph 1.2 (a) of this Part I, details of the capability of the **Generating Unit**, **DC Converter** or **Power Park Module** (as the case may be) to provide **Reactive Power** either:-

(a) in case of a **Generating Unit**, at the generator stator terminals; or

(b) in the case of a **DC Converter** or **Power Park Module**, either at 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,**

in each case by reference to the **Generator Performance Chart** submitted in accordance with **Operating Condition** 2.4.2 of the **Grid Code**, which capability must represent the true operating characteristics of that **Generating Unit**, **DC Converter** or **Power Park Module**; and

4.2 details of the system voltage range over which the **User** proposes to make available from the **Generating Unit**, **DC Converter** or **Power Park Module** such **Enhanced Reactive Power Service** (and in each case any restrictions thereto); and

4.3 in relation to a **Tender** for the **Enhanced Reactive Power Service** specified in sub-Paragraph 1.2 (a) of this Part I, the ambient air temperature at which such **Enhanced Reactive Power Service** is specified, and variations to such **Enhanced Reactive Power Service** in accordance with any air temperature range specified by **The Company**; and

4.4 details, including prices, of any additional services offered as part of any **Enhanced Reactive Power Service** (not being the **Enhanced Reactive Power Service** specified in sub-Paragraph 1.2 (a) of this Part I); and

4.5 any restrictions on **The Company** selecting part of an **Enhanced Reactive Power Service**.

Appendix 6
Qualification and Evaluation Criteria

Section A – Qualification Criteria

1. Without prejudice to the requirements of sub-Paragraph 3.3 of this Part I, all **Tenders** must satisfy the following mandatory qualification criteria:-

   1.1 in relation to a **Tender** for provision of the **Enhanced Reactive Power Service** specified in sub-Paragraph 1.2 (a) of this Part I, the leading and/or lagging capability (as the case may be) comprised therein, being the capability in excess of that required under and in accordance with the **Connection Conditions** of the **Grid Code**, must be at least 15 Mvar leading and/or 15 Mvar lagging (as the case may be) or (if lower) such amount of Mvar representing an additional 10% of that required under and in accordance with the **Connection Conditions** of the **Grid Code** (in each case as measured at the **Commercial Boundary**); and

   1.2 in relation to a **Tender** for provision of any other **Enhanced Reactive Power Service**, the leading and/or lagging capability (as the case may be) comprised therein must ~~be at least 15 Mvar leading and/or 15 Mvar lagging (as the case may be) (as measured at the **Commercial Boundary**)~~meet the requirements of sub-Paragraph 2.8(a) of this Part I; and

   1.3 the tendered capability must be subject to Mvar metering meeting the requirements of Appendix 4; and

   1.4 the tendered capability must be subject to Mvar despatch facilities reasonably acceptable to **The Company**, incorporating the ability for **The Company** to receive from the **Tenderer** relevant technical, planning and other data in **The Company's** reasonable opinion necessary in connection therewith; and

   1.5 the site in question must be the subject of an agreement for connection to, and/or use of, the **GB Transmission System** or (as the case may be) a **Distribution System**.

Section B – Evaluation Criteria

2. The overall economic value of a **Tender** (and where appropriate any part thereof) will be assessed by reference to the following criteria (which are not listed in any order of importance or priority):-

2.1 in relation to a **Generating Unit**, **DC Converter** or **Power Park Module** providing the **Obligatory Reactive Power Service**, a comparison with the default payment arrangements for that **Generating Unit**, **DC Converter** or **Power Park Module** including the effect (if any) of the balance of tendered capability and utilisation prices as a hedge against forecast costs of that **Generating Unit**, **DC Converter** or **Power Park Module** pursuant to the default payment arrangements;

2.2 the location of the tendered capability and its effectiveness in providing voltage support for the **GB Transmission System**;

2.3 its interaction with other **Tenders**, in terms (inter alia) of relatives prices and capability tendered and relative effectiveness in providing voltage support as referred to in sub-paragraph 2.2 above;

2.4 forecast savings (if any) in constraint costs resulting from the consequential effect on power flows; and

2.5 any forecast benefit or detriment attributable to it in the context of the investment planning process referred to at paragraph 4 below.

3. Particular factors affecting the value of a **Tender** (and where appropriate any part thereof) may include (without limitation) the following evaluation criteria (which are not listed in any order of importance or priority):-

3.1 the amount of leading and lagging Mvar tendered and the impact (if any) of any changes in the technical data, the **Registered Capacity** and other information submitted to **The Company** pursuant to the **Data Registration Codes** of the **Grid Code** since the date of submission of the **Tender**;

3.2 prices and other terms offered within the **Tender**;

3.3 the number of months over which capability is tendered;

3.4 forecast Mvarh output, including any revised forecast of Mvarh output taking into account tendered utilisation prices (for the avoidance of doubt of the **Tender** and of all other **Tenders** pursuant to sub-paragraph 2.3 above);

3.5 in relation to a **Generating Unit**, **DC Converter** or **Power Park Module**, forecast MW output and MW availability;

3.6 the expected availability and quality of capability tendered, in terms of reliability and dependability for despatch purposes, derived from:-

(i) historical performance (where relevant);

(ii) expected reliability of capability tendered signalled by tendered prices;

(iii) any programme agreed with **The Company** for the restoration of capability;

3.7 the availability of suitable monitoring facilities;

3.8 the capability (if any) of a **Generating Unit**, **DC Converter** or **Power Park Module** to provide voltage support services when not providing **Active Power** (for example pumped storage plant operating in spin-gen mode or when pumping and open cycle gas turbine plant when declutched and operating in **Synchronous Compensation** mode);

3.9 the complexity of the terms offered within the **Tender**;

3.10 the results of any testing carried out pursuant to sub-Paragraph 4.3 (e) (ii) of this Part I and (where applicable) the absence of any such testing; and

3.11 any other factors enhancing or constraining the capability tendered, derived (inter alia) from technical and other information made available to **The Company** (including without limitation operational and planning data provided to **The Company** pursuant to the **Grid Code**).

4. For the avoidance of doubt, **Tenders** will be considered in the investment planning process of **The Company's Transmission Business** only if, and to the extent, required to enable **The Company** to comply with its obligations under the **Act** and the **Transmission Licence**, and in such a case any consequential benefit or detriment attributable to the **Tender** will be taken into account in the tender evaluation process and **Tenders** will be evaluated accordingly.

5. For the avoidance of doubt:-

(a) extant voltage support for the **GB Transmission System** whether via contracted services from third parties or assets owned and/or operated by **The Company's Transmission Business**; and

(b) forecast Mvarh **Demand** on the **GB Transmission System** and at **Grid Supply Points**

in each case as at the relevant **Market Day** and as anticipated by **The Company** at the subsequent **Contract Start Day** and throughout the term of the **Tender**, will be taken into account in the tender evaluation process and **Tenders** will be evaluated accordingly.

CUSC Schedule 3 - INDICATIVE DRAFTING RELATING TO CAP169

INDICATIVE DRAFTING RELATING TO CAP169

Appendix 7
Charging Principles

In accordance with the relevant provisions of this Part I, the following principles are intended to form the basis of the default payment arrangements for the provision of the **Obligatory Reactive Power Service** set out in this Part I and are intended to be taken into account in any review of the indexation factor referred to in Appendix 1. However, they are not intended to stifle innovation in the development of the default payment arrangements or the giving of appropriate economic signals.

1. The totality of payments that would be made pursuant to the default payment arrangements in the absence of **Market Agreements** shall be based and founded upon the following variable costs (actual or estimated) incurred or to be incurred in respect of, and aggregated across, all **Generating Units**, **DC Converters** and **Power Park Modules** providing the **Obligatory Reactive Power Service**:-

   1.1 the additional heat losses incurred as a consequence of producing **Reactive Power**, measured at the high voltage side of the generator/transformer terminals, the calculation of such heat losses to take account of the square law relationship between the electric current and the additional heat losses incurred; and

   1.2 maintenance costs incurred as a direct result of **Reactive Power** output (including a sum in respect of any reduction in the working life of **Generating Unit**, **DC Converter** or **Power Park Module** components consequent upon **Reactive Power** output).

2. For the avoidance of doubt, and without limitation, the totality of payments referred to in paragraph 1 above shall not take into account in respect of any **Generating Unit**, **DC Converter** or **Power Park Module** providing the **Obligatory Reactive Power Service** the fixed costs incurred in achieving initial compliance with the relevant provisions of the **Grid Code**.

3. Further for the avoidance of doubt, the totality of payments referred to in paragraph 1 above shall, to the extent affecting the specific costs therein identified, take due account of any change in or amendments to, or replacement of, the **Pooling and Settlement Agreement**, the **Balancing and Settlement Code**, the **Grid Code** and any other statutory or regulatory obligation, in each case coming into force or effect after 1st October, 1997 and affecting the provision of the **Obligatory Reactive Power Service**.

Appendix 8
Calculation of Reactive Power Capability at the Commercial Boundary

Part 1

In accordance with the terms of the **Mandatory Services Agreement,** ~~these~~where applicable the formulae in this Part 1 will be used to convert **Reactive Power** capability of a **BM Unit** at the generator stator terminals to the capability at the **Commercial Boundary**.

$$Q_{lead} = (Q_{Glead} + Q_U) + \left[\frac{[(P_G - P_U)^2 + (Q_{Glead} + Q_U)^2] * F * X_t}{100.\,MVA_X}\right] + Q_{ts}$$

Where the **BM Unit** has a **Reactive Power** capability (leading), this shall be expressed as a positive integer. Where the **BM Unit** does not have a **Reactive Power** capability (leading), Q_{lead} and/or Q_{Glead} shall be the minimum **Reactive Power** capability (lagging) expressed as a negative integer or zero.

$$Q_{lag} = (Q_{Glag} - Q_U) - \left[\frac{[(P_G - P_U)^2 + (Q_{Glag} - Q_U)^2] * F * X_t}{100.\,MVA_X}\right] - Q_{ts}$$

Where the **BM Unit** has a **Reactive Power** capability (lagging), this shall be expressed as a positive integer. Where the **BM Unit** does not have a **Reactive Power** capability (lagging), Q_{lag} and/or Q_{Glag} shall be the minimum **Reactive Power** capability (leading) expressed as a negative integer or zero.

Where:

Q_{lead} = the **Reactive Power** capability (leading) of the **BM Unit** at **Rated MW** at the **Commercial Boundary** in Mvar;

Q_{lag} = the **Reactive Power** capability (lagging) of the **BM Unit** at **Rated MW** at the **Commercial Boundary** in Mvar;

P_G = **Rated MW** referred to in Schedule 1 of **Grid Code DRC**;

P_U = normal auxiliary load (**Active Power**) supplied by the **BM Unit** at **Rated MW** referred to in Schedule 1 of **Grid Code DRC** in MW;

Q_U = normal auxiliary lagging load (**Reactive Power**) supplied by the **BM Unit** at **Rated MW** referred to in Schedule 1 of **Grid Code DRC** in Mvar;

X_t = positive sequence reactance, nominal tap, of the **BM Unit** step-up transformer in percentage of rating as referred to in Schedule 1 of **Grid Code DRC**;

F = the factor (if any) identified as such in the **Mandatory Services Agreement** representing the number of station transformers, otherwise 1;

Q_{Glag} = the **Reactive Power** capability (lagging) of the **BM Unit** at **Rated MW** at the generator stator terminals, where applicable as set out in Table B of Appendix 1, Section A, Part I of the **Mandatory Services Agreement** or as redeclared by the **User** pursuant to **Grid Code BC**;

Q_{Glead} = the **Reactive Power** capability (leading) of the **BM Unit** at **Rated MW** at the generator stator terminals, where applicable as set out in Table B of Appendix 1, Section A, Part I of the **Mandatory Services Agreement** or as redeclared by the **User** pursuant to **Grid Code BC**;

Q_{ts} = the relevant reactive load applicable to each of the relevant **BM Unit** shown in the relevant table in the **Mandatory Services Agreement**, the summation of which represents the lagging reactive load in Mvar taken by a **Trading Unit** calculated in accordance with the values for **Demand** (**Active Power**) and **Power Factor** referred to in **Grid Code** PC.A.4.3.1(a) or **Grid Code** PC.A.5.2.2(a) (as the case may be), or as agreed between **The Company** and the **User** from time to time (and where such load is leading, Q_{ts} will be negative);

MVA_X = **BM Unit** step-up transformer rated MVA referred to in Schedule 1 of **Grid Code DRC**.

N.B. All of the above factors referred to in **Grid Code DRC** shall be expressed in such units as are specified in **Grid Code DRC** and to the same number of significant figures as also specified therein (as varied from time to time).

Part 2

In accordance with the terms of the **Mandatory Services Agreement**, where applicable the formulae in Section 1 of this Part 2 will be used by **The Company** to convert **Reactive Power** capability of a **CCGT Unit** at the generator stator terminals to the capability at the HV side of the **Generating Unit** step-up transformer, and the formulae in Section 2 of this Part 2 will be used to calculate the **Reactive Power** capability of the **BM Unit** at the **Commercial Boundary**.

Section 1

$$CQ_{lead} = (Q_{Glead} + Q_u) + \left[\frac{[(P_G - P_U)^2 + (Q_{Glead} + Q_U)^2] * F * X_t}{100.MVA_X}\right]$$

Where the **CCGT Unit** has a **Reactive Power** capability (leading), this shall be expressed as a positive integer. Where the **CCGT Unit** does not have a **Reactive Power** capability (leading), Q_{lead} and/or Q_{Glead} shall be the minimum **Reactive Power** capability (lagging) expressed as a negative integer or zero.

$$CQ_{lag} = (Q_{Glag} - Q_u) - \left[\frac{[(P_G - P_U)^2 + (Q_{Glag} - Q_U)^2] * F * X_t}{100.MVA_X}\right]$$

Where the **CCGT Unit** has a **Reactive Power** capability (lagging), this shall be expressed as a positive integer. Where the **CCGT Unit** does not have a **Reactive Power** capability (lagging), Q_{lag} and/or Q_{Glag} shall be the minimum **Reactive Power** capability (leading) expressed as a negative integer or zero.

Where:

CQ_{lead}	=	the **Reactive Power** capability (leading) of the **CCGT Unit** at **Rated MW** at the HV side of the **Generating Unit** step-up transformer in Mvar;
CQ_{lag}	=	the **Reactive Power** capability (lagging) of the **CCGT Unit** at **Rated MW** at the HV side of the **Generating Unit** step-up transformer in Mvar;
P_G	=	**Rated MW** of a **CCGT Unit** referred to in Schedule 1 of **Grid Code DRC**;
P_U	=	normal auxiliary load **(Active Power)** supplied by the **CCGT Unit** at **Rated MW** referred to in Schedule 1 of **Grid ~~CodeDRC~~Code DRC** in MW;
Q_U	=	normal auxiliary lagging load (**Reactive Power**) supplied by the **CCGT Unit** at **Rated MW** referred to in Schedule 1 of **Grid Code DRC** in Mvar;

F	=	the factor (if any) identified as such in the **Mandatory Services Agreement** representing the number of station transformers, otherwise 1;
X_t	=	positive sequence reactance, nominal tap, of the **CCGT Unit** step-up transformer in percentage of rating as referred to in Schedule 1 of **Grid Code DRC**;
Q_{Glag}	=	the **Reactive Power** capability (lagging) of the **CCGT Unit** at **Rated MW** at the **User** stator terminals as set out in Table B of Appendix 1, Part I of the **Mandatory Services Agreement** or as redeclared by the **User** pursuant to **Grid Code BC**;
Q_{Glead}	=	the **Reactive Power** capability (leading) of the **CCGT Unit** at **Rated MW** at the **User** stator terminals as set out in Table B of Appendix 1, Part I of the **Mandatory Services Agreement** or as redeclared by the **User** pursuant to **Grid Code BC**;
MVA_X	=	**Generating Unit** step-up transformer rated MVA referred to in Schedule 1 of **Grid Code DRC**.

Section 2

Q_{lead} = $\left(\sum_{n}^{CCGTunits} CQlead \right) + Qts$

Q_{lag} = $\left(\sum_{n}^{CCGTunits} CQlag \right) - Qts$

Where

Q_{lead}	=	the **Reactive Power** capability (leading) of the **BM Unit** at the **Commercial Boundary** in Mvar;
$\sum_{n}^{CCGTUnits}$	=	the summation over each relevant **CCGT Unit**;
Q_{lag}	=	the **Reactive Power** capability (lagging) of the **BM Unit** at the **Commercial Boundary** in Mvar;
Q_{ts}	=	the relevant reactive load applicable to each of the **BM Units** shown in the relevant table in the **Mandatory Services Agreement**, the summation of which represents the lagging

reactive load in Mvar taken by a **Trading Unit** calculated in accordance with the values for **Demand (Active Power)** and **Power Factor** referred to in **Grid Code PC.A.4.3.1(a)** or **Grid Code PC.A.5.2.2(a)** (as the case may be), or as agreed between **The Company** and the **User** from time to time (and where such load is leading, Q_{ts} will be negative).

N.B. All of the above factors referred to in **Grid Code DRC** shall be expressed in such units as are specified in **Grid Code DRC** and to the same number of significant figures as also specified therein (as varied from time to time).

Part 3

In accordance with the terms of the **Mandatory Services Agreement**, where applicable the formulae in Section 1 of this Part 3 will be used by **The Company** to convert **Reactive Power** capability of a **Power Park Unit** at the generator stator terminals to the capability at the HV side of the **Generating Unit** step-up transformer, and the formulae in Section 2 of this Part 3 will be used to calculate the **Reactive Power** capability of the **Power Park Module** at the **Commercial Boundary**.

Section 1

$$CQ_{lead} = (Q_{Glead} + Q_u) + \left[\frac{[(P_G - P_U)^2 + (Q_{Glead} + Q_U)^2] * F * X_t}{100.MVA_X}\right]$$

Where the **Power Park Unit** has a **Reactive Power** capability (leading), this shall be expressed as a positive integer. Where the **Power Park Unit** does not have a **Reactive Power** capability (leading), Q_{lead} and/or Q_{Glead} shall be the minimum **Reactive Power** capability (lagging) expressed as a negative integer or zero.

$$CQ_{lag} = (Q_{Glag} - Q_u) - \left[\frac{[(P_G - P_U)^2 + (Q_{Glag} - Q_U)^2] * F * X_t}{100.MVA_X}\right]$$

Where the **Power Park Unit** has a **Reactive Power** capability (lagging), this shall be expressed as a positive integer. Where the **Power Park Unit** does not have a **Reactive Power** capability (lagging), Q_{lag} and/or Q_{Glag} shall be the minimum **Reactive Power** capability (leading) expressed as a negative integer or zero.

Where:

CQ_{lead} = the **Reactive Power** capability (leading) of the **Power Park Unit** at **Rated MW** at the HV side of the **Generating Unit** step-up transformer in Mvar;

CQ_{lag} = the **Reactive Power** capability (lagging) of the **Power Park Unit** at **Rated MW** at the HV side of the **Generating Unit** step-up transformer in Mvar;

P_G = **Rated MW** of a **Power Park Unit** referred to in Schedule 1 of **Grid Code DRC**;

P_U = normal auxiliary load **(Active Power)** supplied by the **Power Park Unit** at **Rated MW** referred to in Schedule 1 of **Grid Code DRC** in MW;

Q_U = normal auxiliary lagging load (**Reactive Power**) supplied by the **Power Park Unit** at **Rated MW** referred to in Schedule 1 of **Grid Code DRC** in Mvar;

F = the factor (if any) identified as such in the **Mandatory Services Agreement** representing the number of **Power Park Units** transformers, otherwise 1;

X_t = positive sequence reactance, nominal tap, of the **Power Park Unit** step-up transformer in percentage of rating as referred to in Schedule 1 of **Grid Code DRC**;

Q_{Glag} = the **Reactive Power** capability (lagging) of the **Power Park Unit** at **Rated MW** at the **User** stator terminals as set out in Table B of Appendix 1, Part I of the **Mandatory Services Agreement** or as redeclared by the **User** pursuant to **Grid Code BC**;

Q_{Glead} = the **Reactive Power** capability (leading) of the **Power Park Unit** at **Rated MW** at the **User** stator terminals as set out in Table B of Appendix 1, Part I of the **Mandatory Services Agreement** or as redeclared by the **User** pursuant to **Grid Code BC**;

MVA_X = **Generating Unit** step-up transformer rated MVA referred to in Schedule 1 of **Grid Code DRC**.

Section 2

$$Q_{lead} = \left(\sum_{n}^{PPUnits} CQ_{lead} \right) + Q_{ts} + \left[\frac{\left[(P1_G - P1_U)^2 + (Q1_{Glead} + Q1_U)^2 \right] * F1 * X1_t}{100.MVA1_x} \right]$$

$$Q_{lag} = \left(\sum_{n}^{PPUnits} CQ_{lag} \right) - Q_{ts} - \left[\frac{\left[(P1_G - P1_U)^2 + (Q1_{Glag} - Q1_U)^2 \right] * F1 * X1_t}{100.MVA1_x} \right]$$

Where

Q_{lead} = the **Reactive Power** capability (leading) of the **Power Park Module** at the **Commercial Boundary** in Mvar;

$\sum_{n}^{PPUnits}$ = the summation over each relevant **Power Park Unit**;

Q_{lag} = the **Reactive Power** capability (lagging) of the **BM Unit** at the **Commercial Boundary** in Mvar;

Q_{ts} = [the relevant reactive load applicable to the **Power Park Module** shown in the relevant table in the **Mandatory Services Agreement**, the summation of which represents the lagging reactive load in Mvar taken by a **Trading Unit** calculated in accordance with the values for **Demand (Active Power)** and **Power Factor** referred to in **Grid Code PC.A.4.3.1(a)** or **Grid Code PC.A.5.2.2(a)** (as the case may be), or as agreed between **The Company** and the **User** from time to time (and where such load is leading, Q_{ts} will be negative).]

$P1_G = \sum_{n}^{PPUnits} P_G$

$P1_U = \sum_{n}^{PPUnits} P_U$

$Q1_{Glag} = \sum_{n}^{PPUnits} Q_{Glag}$

$Q1_{Glead} = \sum_{n}^{PPUnits} Q_{Glead}$

$F1$ = the factor (if any) identified as such in the **Mandatory Services Agreement** representing the number of station transformers, otherwise 1;

$X1_t$ = positive sequence reactance, nominal tap, of the **Power Park Module** step up transformer in percentage of rating as referred to in Schedule 1 of **Grid Code DRC**

$MVA1_x$ = **Power Park Module** step-up transformer rated MVA referred to in Schedule 1 of **Grid Code DRC**

N.B. All of the above factors referred to in **Grid Code DRC** shall be expressed in such units as are specified in **Grid Code DRC** and to the same number of significant figures as also specified therein (as varied from time to time).

Appendix 9
Redundant Provisions

1. Introduction

This Appendix 9 is included in this Part I for information purposes only as more particularly described in Paragraph 6 of this Part I.

2. Definitions - Paragraph 1.1 of MCUSA, Schedule 5.

In this Appendix 9, except where the context otherwise requires, the following expressions shall have the following meanings:-

"Reactive Power Zone"	means those separate areas of England and Wales identified as zones in the Seven Year Statement for 1997 for the purpose of specifying local Reactive Power capability and need;
"Relevant Zone"	means in relations to any Despatch Unit, the Reactive Power Zone to which the Despatch Unit is allocated as specified in an Ancillary Services Agreement~~.~~;
"Transmission Users Group"	means the group established pursuant to paragraph 4 of Schedule 4 to this Agreement.

3. Variations and Review – Paragraph 2.5 of MCUSA Schedule 5

The Parties acknowledge and agree that the Transmission Users Group shall be requested to review each of the matters described in Appendix 7 by the respective date (if any) shown opposite each therein. In carrying out such review, the Transmission Users Group shall be requested to take into account the respective applicable principles (if any) set out therein and to give due and proper consideration to any matter referred to it by the Director. For the avoidance of doubt, following each such review The Company or any User may raise a Proposed Variation with respect thereto in accordance with sub-paragraph 2.2(a). It is further agreed that:-

(a) **The Company** shall consider and no later than 31st December 1999, report to the Transmission Users Group on the practicalities of establishing a unified mechanism for the provision of voltage support for **The Company** Transmission System; and

(b) the Transmission Users Group shall be requested, no later than 31st March 2000 to invite the Grid Code Review Panel to review the provisions of the Grid Code with respect to Reactive Power in light of this Schedule.

4. Obligatory Reactive Power Service – Default Payment Arrangements – Paragraph 4 of MCUSA, Schedule 5

4.1 ---

4.2 Subject always to Paragraph 5, and notwithstanding:-

(a) the provisions of the Works Programme for reactive power ancillary services agreed by Pool Members on 1st March 1994, as adopted from 1st August 1994; and

(b) the provisions of any **Ancillary Services Agreement** now or hereafter in effect (but subject always to sub-Paragraph 6.2),

the payments to be made by **The Company** to **Users** for the provision of the **Obligatory Reactive Power Service** in all **Mandatory Services Agreements** under which **Users** are or will be paid for the **Obligatory Reactive Power Service** shall, subject always to sub-Paragraph 4.5 and 4.7, comprise solely payments for utilisation determined in respect of each **Settlement Period** in accordance with sub-Paragraph 4.3.

4.3 ---

4.4 The Parties acknowledge and agree that, as at the date this Schedule comes into effect:-

(a) the totality of payments for the provision of the **Obligatory Reactive Power Service**, determined in accordance with the provisions of this Paragraph 4, reflect so far as reasonably practicable the overall variable costs (on the basis of the charging principles set out in Appendix 8) incurred across the relevant **Generating Units** of the provision of the **Obligatory Reactive Power Service** (whether or not payments are made in respect of those **Generating Units** pursuant to this Paragraph 4 or pursuant to **Market Agreements** entered into in accordance with Paragraph 5); and

(b) without prejudice to the review of the indexation factor specified as item 4 in Appendix 7, such totality of payments will continue to reflect those overall variable costs notwithstanding all and any variations thereto reasonably anticipated at such date.

4.5 It is hereby agreed and acknowledged that nothing in this Schedule and the Appendices shall affect in any way the obligation on each **User** to comply with the provisions of the **Grid Code** insofar as they relate to **Reactive Power**. For the avoidance of doubt, and without limiting the foregoing, it is hereby agreed and acknowledged that, notwithstanding that the payments for the **Obligatory Reactive Power Service** with affect from 1st April 2000, subject always to sub-paragraph 2.5 shall comprise solely payments for utilisation, nothing in this Schedule and the Appendices shall relieve **Users** from the obligations to comply with the provisions of the **Grid Code** in relation to **Reactive Power** by virtue of Sub-Clause 9.3 of this Agreement or otherwise howsoever.

4.6 ---

4.7 ---

4.8 ---

5. Obligatory Reactive Power Service (Default Payment Arrangements) – Appendix 1 of MCUSA, Schedule 5

The provisions of this Appendix 1, as referred to in sub-paragraph 4.2 of this Schedule shall apply to the calculation of default payments for provision of the **Obligatory Reactive Power Service** from **BM Units**. All payments shall be expressed in pounds sterling.

1. Total Payment

Total Payment (PT) = PU+PC

Where, subject always to Paragraph 7 and 8 below:

PU = the utilisation payment in respect of a **BM Unit** for a **Settlement Period** determined in accordance with Paragraph 2 below.

PC = the capability payment in respect of BM Unit for a Settlement Period determined in accordance with paragraph 3 below.

2. Utilisation Payment

PU = BP_U*U [£ per **Settlement Period** per **BM Unit**]

Where

$BP_U = \frac{46{,}270{,}000 * 1 * X}{42{,}054{,}694}$ [£/Mvarh]

Where

I = defined in Paragraph 5 below;

X = a factor which should be:-

(i) in respect of any Settlement Period from (and including) 1st October, 1997 to (and including) 31st March 1998, 0.2; and

(ii) in respect of any Settlement Period from (and including) 1st April 1998 to (and including 31st March 1999, 0.5 (subject as provided below); and

(iii) subject always to sub-paragraph 2.5 of this Schedule, in respect of any Settlement Period from (and including) 1st April 1999 to (and including) 31st March 2000, 0.75 (subject as provided below); and

(iv) subject always to sub-paragraph 2.5 of this Schedule, in respect of all Settlement Periods thereafter, 1.00 (subject as provided below);

Provided always that with effect from 1st April 1998, X shall be 0.2 in all **Settlement Periods** from (and including) that in which:-

(a) the relevant **BM Unit** (or, in relation to a **CCGT Module**, any relevant **CCGT Unit**) fails a **Reactive Test** until (and including) the **Settlement Period** in which a subsequent **Reactive Test** is passed in relation to that **BM Unit** (or **CCGT Unit** (as the case may be)); or

(b) the **User** fails (other than pursuant to an instruction given by **The Company** or as permitted by the **Grid Code**) to set the Automatic Voltage Regulator of the **BM Unit** (or, in relation to a **CCGT Module**, any relevant **CCGT Unit**) to a voltage following mode until

(and including) the **Settlement Period** in which the **User** notifies **The Company** that the Automatic Voltage Regulator is so set; or

(c) the **BM Unit** fails to comply with a **Reactive Despatch Instruction** due to the fact that the **BM Unit** (or, in relation to a **CCGT Module**, any relevant **CCGT Unit**) is unable to increase and/or decrease its Mvar output (other than as a direct result of variations in **System** voltage) until (and including) the **Settlement Period** in which the **User** notifies **The Company** that the **BM Unit** is so able to comply; or

(d) the **BM Unit** fails to have a Mvar range which includes the ability to provide zero Mvar at the Commercial Boundary until (and including) the **Settlement Period** in which the **User** notifies **The Company** that the **BM Unit** has or once more has such rang; and

U = defined in Section 1 of Appendix 3

3. Capability Payment

PC = $[[BP_c * ZWF_{lead} * QC_{lead} * QSF_{lead}) + (BP_c * ZWF_{lag} * QC_{lag} * QSF_{lag})] * J]$

[£ per Settlement Period per Despatch Unit]

Provided always that PC shall be 0 in all Settlement Periods from (and including) that in which:-

(i) the User fails (other than pursuant to an instruction given by The Company or as permitted by the Grid Code) to set the Automatic Voltage Regulator of the Despatch Unit (or, in relation to a Centrally Despatched CCGT Module, any relevant CCGT Unit) to a voltage following mode until (and including) the Settlement Period in which the User notifies The Company that the Automatic Voltage Regulator is so set; or

(ii) the Despatch Unit fails to comply with a Reactive Despatch Instruction due to the fact that the Despatch Unit (or in relation to a Centrally Despatched CCGT Module, any relevant CCGT Unit) is unable to increase and/or decrease its Mvar output (other than as a direct result of variations in System voltage) until (and including) the Settlement Period in which the User notifies The Company that the Despatch Unit is so able to comply; or

(iii) the Despatch Unit fails to have a Mvar range which includes the ability to provide zero Mvar at the Commercial Boundary until (and including) the Settlement Period in which the User notifies The

Company that the Despatch Unit has or once more has such range; or

(iv) a continuous period of unavailability of a Despatch Unit to be Despatched by The Company in accordance with Grid Code SDC extends beyond 75 consecutive days until (and including) the Settlement Period in which the Despatch Unit is subsequently declared available in accordance with Grid Code SDC.

where

BP_c = $\frac{46{,}270{,}000 * 1 * Y}{0.868178624 * 16{,}112 * 8{,}760 * 2}$ [£/Mvar per Settlement Period]

Where

I = defined in paragraph 5 below;

Y = a factor which shall be:-

(i) in respect of any Settlement Period from (and including) 1st October, 1997 to (and including) 31st March 1998, 0.8; and

(ii) in respect of any Settlement period from (and including) 1st April, 1998 to (and including) 31st March, 1999, 0.5; and

(iii) subject always to sub-paragraph 2.5 of this Schedule, in respect of any Settlement Period from (and including) 1st April, 1999 to (and including) 31st March, 2000, 0.25; and

(iv) subject always to sub-paragraph 2.5 of this Schedule, in respect of all Settlement Periods thereafter, 0;

ZWF = the provisional Zonal Weighting Factor defined in paragraph 4 below (expressed to apply to both leading and lagging Mvar) subject to reconciliation in accordance with that paragraph:

QC = defined in Section 2 of Appendix 3 (expressed to apply to both leading and lagging Mvar);

QSF = the shortfall factor relating to the capability payment (expressed as either QSF_{lead} or QSF_{lag} to apply respectively to capability leading and capability lagging as applicable), being:-

$$\min\left(1,\left(\frac{QR}{QC}\right)^2\right)$$

where

QR = defined in Section 2 of Appendix 3 (expressed to apply to both leading and lagging Mvar); and

J = 1 in each Settlement Period in which, in relation to the Despatch Unit in question, Genset Registered Capacity is greater than 2MW, otherwise 0.

4. Zonal Weighting Factors

ZWF = the Provisional Zonal Weighting Factor (expressed as either ZWF_{lead} or ZWF_{lag} to apply respectively to the zonal weighting factor leading and the zonal weighting factor lagging) for the Despatch Unit, calculated as follows:-

(a) In respect of the period from (and including) 1st October, 1997 to (and including) 31st March, 1998 and in respect of each subsequent twelve month period ending 31st March, provisional zonal weighting factors ("the Provisional Zonal Weighting Factors") shall be calculated by The Company in respect of both leading and lagging Reactive Power by reference to:-

(i) the leading or lagging (as the case may be) Mvar "need" for leading or lagging (as the case may be) Reactive Power for that period in each Relevant Zone, divided by

(ii) the total leading or lagging (as the case may be) Mvar capability for that period in each Relevant Zone as forecast by The Company ("the Total Forecast Capability"),

with the result of that division in each case being multiplied by an adjustment factor being:-

$$\frac{\mathbf{16112}}{\text{TAN}}$$

Where

TAN = a figure being, for the period from (and including) 1st October, 1997 to (and including) 31st March

1998, 14,775, and for each subsequent twelve month period ending 31st March, a figure being the sum total of the leading Mvar "need" for leading Reactive Power plus the sum total of the lagging Mvar "need" for lagging Reactive Power in all Reactive Power Zones for the twelve month period in question, as given each year in the Seven Year Statement,

provided that each Provisional Zonal Weighting Factor (both leading and lagging) shall not in any event be greater than 3.000 and provided further that (for the avoidance of doubt) no determination of $ZWF_{lead,}$ ZWF_{lag} and TAN shall be made in respect of any such twelve month period when Y = 0.

(b) The Provisional Zone Weighting Factors, together with the Total Forecast Capability, will be notified by The Company as soon as reasonably practicable by publication in the first practicable Seven Year Statement (or any update thereof).

Reconciliation

As soon as reasonably practicable following the expiry of each twelve month period ending 31st March, The Company shall recalculate ZWF_{lead} and ZWF_{lag} for that twelve month period in accordance with the above provision for calculation of the Provisional Zonal Weighting Factors but substituting for the Total Forecast Capability the actual total leading or lagging (as the case may be) Mvar capability for that twelve month period in each Relevant Zone as determined by The Company ("the Total Actual Capability"). Such recalculation of ZWF_{lead} and ZWF_{lag} shall be undertaken by The Company in a manner consistent with the principles and methodologies set out in the document entitled "Methodology Document for the Recalculation of Zonal Weighting Factors" published by The Company for this purpose. Such recalculated figures for ZWF_{lead} and ZWF_{lag} ("the Final Zonal Weighting Factors"), together with the Total Actual Capability, shall be published by The Company in the Seven Year Statement. Each Final Zonal Weighting Factor (both leading and lagging) shall not in any event be greater than 3.000 and (for the avoidance of doubt) no determination of ZWF_{lead} ZWF_{lag} and TAN shall be made in respect of any such twelve month period when Y=0.

The Company shall derive the Total Actual Capability from the Mvar capability (required under and in accordance with the Connection Conditions of the Grid Code) of Generating Units in respect of which

Ancillary Services Agreements have been or will be amended or concluded to give effect to the provisions of sub-paragraphs 4.2 and 4.3 of this Schedule. In respect of any twelve month period ending 31st March, such Mvar capability shall be reduced pro rata for all Settlement Periods in such twelve month period in respect of which no capability payments referred to in this Appendix 1 shall fall due:-

(a) by virtue of paragraph 7 below (with effect from the commencement of the twelve month period in question); and

(b) by virtue of paragraph 8 below (until the end of the twelve month period in question); and

(c) by virtue of factor J referred to in paragraph 3 above being set to zero (at any time during the twelve month period in question).

As soon as reasonably practicable following publication of the relevant Seven Year Statement, The Company shall pay to each relevant User or be paid by each relevant User such sum as will reconcile:-

(i) capability payments made to that User and calculated in accordance with paragraph 3 above by reference to the Provisional Zonal Weighting Factors,

with

(ii) capability payments due to or from that User and calculated in accordance with paragraph 3 above by reference to the Final Zonal Weighting Factors.

For the avoidance of doubt, such reconciliation will include the payment of interest at the Base Rate from the date of payment by The Company to that User of the capability payments referred to at (i) above.

For clarification purposes, each reference in this paragraph 4 to "need" does not imply actual Reactive Power need but is used merely to refer to the figure identified as "need" in the Seven Year Statement. Such figure shall be determined each year using the same principles and methodologies as used to determine the zonal weighting factors for the twelve month periods ended on 31st March 1996 and 31st March 1997.

5. Indexation

The indexation factor I used in the formulae in Paragraph 2 above shall [1][, with effect form 1st October 1997 in respect of the period from (and

including) that date to (and including) 31st March 1998,] with effect from 1st April in respect of each subsequent twelve month period ending 31st March, be determined as follows:-

$$I = \frac{RP1_2}{RP1_1}$$

where

For the period from (and including) 1st October, 1997 to (and including) 31st March, 1998 RPI_2 =155.4, and thereafter RPI_2 is the RPI for March of the immediately preceding twelve month period ending 31st March.

RPI_1 is the RPI for March, 1994 (142.5).

The index used is the Retail Price Index (RPI) with 1987 = 100 base. The source of the RPI index is the monthly Department of Employment "Employment Gazette".

Subject always to sub-paragraph 2.5 of this Schedule, In respect of all periods from (and including) 1st April, 2001 the indexation factor I applicable for the period from (and including) 1st April, 2000 to (and including) 31st March 2001 shall apply.

6. ---

7. ---

8. ---

9. Reconciliation

As soon as practicable after this Schedule has taken effect and Ancillary Services Agreements have been amended so as to give effect thereto, The Company will pay to each relevant user or be paid by each relevant User such sum as will reconcile:-

(a) payments (if any) made to such User for the provision of the Obligatory Reactive Power Service from BM Units in respect of the period from 1st October, 1997 to (and including) the date of such reconciliation by The Company

with

(b) payments due to or from such User pursuant to any Ancillary Services Agreement giving effect to this Schedule in respect of

the period from 1st October, 1997 to the date of such reconciliation (both dates inclusive) as if such Ancillary Services Agreements had then been effective. For the avoidance of doubt, such reconciliation will include the payment of interest at Base Rate from the date of the relevant payment by The Company referred to at sub-paragraph 9(a) above.

6. Metering – Appendix 4 of MCUSA Schedule 5

2.4 Subject always to sub-paragraph 2.5, the appropriate factors and methodologies for each relevant **BM Unit** shall be agreed by **The Company** and each relevant **User** (both acting reasonably) in the relevant **Mandatory Services Agreement** by adoption of one or more of the factors or methodologies set out in the document entitled "Methodology Document for the Aggregation of Reactive Power Metering" (as amended from time to time) published by **The Company** for this purpose. This document shall specify the respective factors and methodologies to be applied for particular **Metering System** configurations in order to determine so far as reasonably practicable the Mvarh import value and Mvarh export value for the relevant **BM Unit** at the **Commercial Boundary** as required by this sub-paragraph 2.4.

2.5 Loss adjustment factors and aggregation methodologies need not be agreed between **The Company** and the relevant **User** in connection with any configuration described in sub-paragraph 2.4.3 in respect of periods prior to (1st April 1998).

7. Matters for Review - Appendix 7 of MCUSA, Schedule 5

	Matter	**Date of review**
1.	The values of X and Y referred to in Appendix 1 in respect of Settlement Periods from (and including) 1st April 1999. Applicable principle: The degree and extent to which a competitive market has been established in accordance with the provisions of this Schedule (taking into account, inter alia, the amount of Mvar capability the subject of	1st October 1998

Market Agreements and the utilisation thereof).	
2. Any payment arrangements formulated by The Company in conjunction with any unlicensed providers . Applicable principle: The extent to which it is reasonably practicable to achieve consistency with the provisions of Appendix 1 or Appendices 2 and 5 (as the case may be). 3. The treatment of Trading Units for the purposes of metering and calculation of Mvar capability in connection with this Schedule. Applicable principle: None	1st October 1999 1st October 1999
The indexation factor referred to in Appendix 1 to apply in respect of all periods from (and including) 1st April 2001. Applicable principles: Those charging principles set out in Appendix 8.	1st October 2000
5. (a) The extent of any change in the nature of, or extent of recovery under the Balancing and Settlement Code of, variable costs incurred or to be incurred by Generating Units providing the Obligatory Reactive Power Service; and (b) the extent to which such	Not applicable

changes should lead to a change in the specific costs identified in paragraph 1 of Appendix 8 upon which the totality of payments referred to therein is based and founded. Applicable principle: That, to the extent innovation in the development of the default payment arrangements or the giving of appropriate economic signals is not thereby stifled, the specific costs from time to time identified in paragraph 1 of Appendix 8 (and upon which the totality of payments referred to therein is based and founded) should continue to comprise the totality of variable costs (actual or estimated) incurred or to be incurred in respect of, and aggregated across, all Generating Units providing the Obligatory Reactive Power Service, provided always that each of those specific costs from time to time identified shall only be a variable cost not recovered under the Balancing and Settlement Code which:- (i) is not being incurred at the date this Schedule comes into effect; or (ii) is being incurred at the date this Schedule comes into effect and as at that date is either identified as a	

	specific cost in paragraph 1 of Appendix 8 or is being recovered under the Balancing and Settlement Code.	

8. Charging Principles - Appendix 8 of MCUSA Schedule 5

In accordance with the relevant provisions of this Part I, the following principles are intended to form the basis of the default payment arrangements for the provision of the **Obligatory Reactive Power Service** set out in this Schedule I and are intended to be taken into account in any review of the indexation factor referred to in Appendix 1. However, they are not intended to stifle innovation in the development of the default payment arrangements or the giving of appropriate economic signals. It is therefore the Parties' intention that, upon any change in the nature of, or extent of recovery under the Balancing and Settlement Code of, variable costs (actual or estimated) incurred or to be incurred by Generating Units providing the Obligatory Reactive Power Service, the specific costs identified in paragraph 1 below shall be a matter for review by the Transmission Users Group as more particularly referred to as item 5 of Appendix 7.

Part II

Not Used

PART B – PROPOSED LEGAL TEXT TO MODIFY THE CUSC - Text to give effect to the draft Working Group Alternative Amendment 1

Please note this legal text is draft for the purposes of the Working Group Consultation and has not been fully agreed by the Working Group.

In addition to the changes proposed for the original, draft WGAA1 will require introduction of an additional definition for Temporary Enduring Reactive Despatch Network Restriction, and an alternative proposal for the changes to Schedule 3 (appendix 1 and 2). For the purposes of this consultation only these additional changes are included in this Part B of Working Group Consultation Volume 2, with all other changes (not repeated here) in Part A of Working Group Consultation Volume 2 also being applicable.

WGAA1 – Proposed drafting CUSC

"**Temporary Enduring Reactive Despatch Network Restriction**"	means, with respect to any **Embedded Generating Unit**, **Embedded Power Park Module** or **DC Converter** at an **Embedded DC Converter Station**, a **Reactive Despatch Network Restriction** (not being a **Pre-Connection Reactive Despatch Network Restriction**) which either: (a) has been in place at the relevant time for more than 12 consecutive months; or (b) when combined with any one or more previous **Reactive Despatch Network Restrictions** (including for the avoidance of doubt any **Pre-Connection Reactive Despatch Network Restriction**), has affected the relevant **Embedded Generating Unit**, **Embedded Power Park Module** or **DC Converter** for an aggregate period of more than 12 months in any consecutive 24 month period;

Schedule 3, APPENDIX 1

Obligatory Reactive Power Service – Default Payment Arrangements

The provisions of this Appendix 1, as referred to in sub-Paragraph 2.2 of this Part I, shall apply to the calculation of default payments for provision of the **Obligatory Reactive Power Service** from **BM Units**. All payments shall be expressed in pounds sterling.

1. **Total Payment**

Total Payment (PT) = PU *[£ per **Settlement Period** per **BM Unit**]*

where, subject always to paragraphs 5 and 6 below:

PU = the utilisation payment in respect of a **BM Unit** for a **Settlement Period** determined in accordance with paragraph 2 below.

2. **Utilisation Payment**

PU = BP_U * U *[£ per **Settlement Period** per **BM Unit**]*

Where

BP_U = $\frac{46{,}270{,}000*I*X}{42{,}054{,}693}$ *[£/Mvarh]*

Where

I = defined in paragraph 3 below;

X = 1 (unless the circumstances in sub-paragraphs (a) through to (e) ~~(d)~~ **(e)** apply)

And where X shall be 0.2 in all **Settlement Periods** from (and including) that in which:-

(a) the relevant **BM Unit** (or, in relation to a **CCGT Module**, any relevant **CCGT Unit**) fails a **Reactive Test** until (and including) the **Settlement Period** in which a subsequent **Reactive Test** is passed in relation to that **BM Unit** (or **CCGT Unit** (as the case may be)); or

(b) the **User** fails (other than pursuant to an instruction given by **The Company** or as permitted by the **Grid Code**) to set the automatic voltage regulator of the **BM Unit** (or, in relation to a **CCGT Module**, any relevant **CCGT Unit**) to a voltage following mode until (and including) the **Settlement Period** in which the **User** notifies **The Company** that the automatic voltage regulator is so set; or

(c) the **BM Unit** fails to comply with a **Reactive Despatch Instruction** due to the fact that the **BM Unit** (or, in relation to a **CCGT Module**, any relevant **CCGT Unit**) is unable to increase and/or decrease its Mvar output (other than as a direct result of variations in **System** voltage) until (and including) the **Settlement Period** in which the **User** notifies **The Company** that the **BM Unit** is so able to comply; or

(d) the **BM Unit** fails to have a Mvar range which includes the ability to provide zero Mvar at the **Commercial Boundary** until (and including) the **Settlement Period** in which the **User** notifies **The Company** that the **BM Unit** has or once more has such range; ~~**and**~~ **or**

(e) **the BM Unit is affected by either a Pre-Connection Reactive Despatch Network Restriction or a Temporary Enduring Reactive Despatch Network Restriction, in each case until (and including) the Settlement Period in which notification is given to The Company pursuant to the Grid Code that such Reactive Despatch Network Restriction is no longer affecting that BM Unit; and**

U = defined in Section 1 of Appendix 3

Schedule 3, Appendix 2

Obligatory Reactive Power Service and Enhanced Reactive Power Services – Market Payment Mechanism

The provisions of this Appendix 2, as referred to in sub-Paragraph 3.3(d)(i) of this Part I, shall apply to the calculation of payments in respect of **Tenders** comprising prices for and **Tendered Capability Breakpoints** relating to the **Obligatory Reactive Power Service** and in respect of **Tenders** comprising terms for the provision of the **Enhanced Reactive Power Services** specified in sub-Paragraph 1.2(a) of this Part I, in each case in respect of **BM Units**. All payments shall be expressed in pounds sterling. All algebraic terms contained in this Appendix 2 shall bear the meanings set out in paragraph 1 below unless the context otherwise requires.

1. **Definitions**

For the purposes of this Appendix 2, unless the context otherwise requires, the following terms shall have the following meanings:-

CA1,CA2 and CA3	=	the available capability prices (expressed to apply to both leading and lagging) (£/Mvar/h) (as more particularly described in paragraph 2 of Appendix 5) as specified in the relevant **Market Agreement**;
CS1,CS2 and CS3	=	the synchronised capability prices (expressed to apply to both leading and lagging) (£/Mvar/h) (as more particularly described in paragraph 2 of Appendix 5) as specified in the relevant **Market Agreement**;
CU1,CU2 and CU3	=	the utilisation prices (expressed to apply to both leading and lagging) (£/Mvarh) (as more particularly described in paragraph 2 of Appendix 5) as specified in the relevant **Market Agreement**;
K	=	in respect of **CCGT Modules**, the relevant configuration factor as specified in the relevant **Market Agreement**, otherwise 1;
Q_{lead}	=	defined in Section 2 of Appendix 3;
Q_{lag}	=	defined in Section 2 of Appendix 3;
QM_{ij}	=	**BM Unit Metered Volume** (as defined in the **Balancing and Settlement Code**);
Q1, Q2 and Q3	=	the contracted capability breakpoints (expressed to apply to both leading and lagging) in whole Mvar as may be specified in the relevant **Market Agreement**, where:

(i) Q1 = TQ1,
Q2 = TQ2
and Q3 = QC
where $TQ2 < QC \leq TQ3$

(ii) Q1 = TQ1,
Q2 = QC
Q3 = null

where TQ1 < QC≤TQ2

(iii) Q1 = QC,
Q2 = null
Q3 = null
where 0≤ QC≤TQ1

SPD	=	the duration of a **Settlement Period**, being 0.5;
TQ1, TQ2 and TQ3	=	defined in Appendix 5;
U_{lead}	=	defined in Section 1 of Appendix 3;
U_{lag}	=	defined in Section 1 of Appendix 3;
V	=	the system voltage range performance factor (expressed to apply to both leading and lagging) as calculated in accordance with the formulae set out in the relevant **Market Agreement**, otherwise 1;
$MEL_i(t)$	=	**Maximum Export Limit** (as defined in the **Balancing and Settlement Code**).

2. **Total Payment**

Total Payment (PTM) = PUM + PCA + PCS *[£ per **Settlement Period** per **BM Unit**]*

where, subject always to paragraphs 6, 7 and 8 below:

PUM = the utilisation payment in respect of a **BM Unit** for a **Settlement Period** determined in accordance with paragraph 3 below;

PCA = the available capability payment in respect of a **BM Unit** for a **Settlement Period** determined in accordance with paragraph 4 below; and

PCS = the synchronised capability payment in respect of a **BM Unit** for a **Settlement Period** determined in accordance with paragraph 5 below.

Provided always that PTM shall be 0 in all **Settlement Periods** from and including that in which:-

(a) the relevant **BM Unit** (or, in relation to a **CCGT Module**, any relevant **CCGT Unit**) fails a **Reactive Test** or a **Contract Test** until (and including) the **Settlement Period** in which a subsequent **Reactive Test** or **Contract Test** (as the case may be) is passed in relation to that **BM Unit** (or **CCGT Unit** (as the case may be)); or

(b) the **User** fails (other than pursuant to an instruction given by **The Company** or as permitted by the **Grid Code**) to set the automatic voltage regulator of the **BM Unit** (or, in relation to a **CCGT Module**, any relevant **CCGT Unit**) to a voltage following mode until (and including) the **Settlement Period** in which the **User** notifies **The Company** that the automatic voltage regulator is so set; or

(c) the **BM Unit** fails to comply with a **Reactive Despatch Instruction** due to the fact that the **BM Unit** (or, in relation to a **CCGT Module**, any relevant **CCGT Unit**) is unable to increase and/or decrease its Mvar **Output** (other than as a direct result of variations in **System** voltage) until (and including) the **Settlement Period** in which the **User** notifies **The Company** that the **BM Unit** is so able to comply; or

(d) the **BM Unit** fails to have a Mvar range which includes the ability to provide zero Mvar at the **Commercial Boundary** until (and including) the **Settlement Period** in which the **User** notifies **The Company** that the **BM Unit** has or once more has such range**; or**

(e) the BM Unit is affected by either a Pre-Connection Reactive Despatch Network Restriction or a Temporary Enduring Reactive Despatch Network Restriction, in each case until (and including) the Settlement Period in which notification is given to The Company pursuant to the Grid Code that such Reactive Despatch Network Restriction is no longer affecting that BM Unit.

PART C – PROPOSED LEGAL TEXT TO MODIFY THE CUSC - Text to give effect to the draft Working Group Alternative Amendment 2

The text required to give effect to WGAA2 will be all the text outlined in Part A of Working Group Consultation Volume 2, apart from the text specifically associated with part 3 of the original CAP169.

To be clear, this will include changes to:

- Part 1: Section 1, Section 4, Section 11, Schedule 2 and Schedule 3
- Part 2: Schedule 3 (2.8ii and Appendix 6, 1.2)

But will not include changes to:

- Part 3: Section 11 (definitions for Network Operator, Reactive Despatch Network Restriction and Pre-Connection Reactive Despatch Network Restriction) and Schedule 3 (Appendix 1, 2e and Appendix 2, 2e)

PART D - PROPOSED LEGAL TEXT TO MODIFY THE GRID CODE - Text to give effect to the CUSC original Amendment Proposal

Please note this legal text is draft for the purposes of the Working Group Consultation and has not been fully agreed by the Working Group.

The proposed corresponding revisions for CAP169 to the Grid Code are outlined below:

- With regards part 1 of CAP169 - the appropriate capability data table for submission of revised Mvar capability by Power Park Modules is required within BC2 Appendix 3.

- With regards part 3 of CAP169 changes to PC.A.3.2.2 to facilitate communication of the specified connection restriction from both the DNO and the embedded generator (with corresponding changes required to DRC Schedule 11 and OC2).

- Additional definitions for Reactive Despatch Instruction, Commercial Boundary and Reactive Despatch Network Restriction.

1 – BC2, Appendix 3

2 – PC.A.3.2.2

3 – OC2

4 – DRC Schedule 11

5 – Glossary and Definitions

Appendix 3 – Submission of Revised Mvar Capability

BC2.A.3.1 For the purpose of submitting revised Mvar data the following terms shall apply:

Full Output	In the case of a **Synchronous Generating Unit** (as defined in the Glossary and Definitions and not limited by BC2.2) is the MW output measured at the generator stator terminals representing the LV equivalent of the **Registered Capacity** at the **Grid Entry Point**, and in the case of a **Non-Synchronous Generating Unit** (excluding **Power Park Units**), **DC Converter** or **Power Park Module** is the **Registered Capacity** at the **Grid Entry Point**
Minimum Output	In the case of a **Synchronous Generating Unit** (as defined in the Glossary and Definitions and not limited by BC2.2) is the MW output measured at the generator stator terminals representing the LV equivalent of the **Minimum Generation** at the **Grid Entry Point**, and in the case of a **Non-Synchronous Generating Unit** (excluding **Power Park Units**), **DC Converter** or **Power Park Module** is the **Minimum Generation** at the **Grid Entry Point**

BC2.A.3.2 The following provisions apply to faxed submission of revised Mvar data:

(a) The fax must be transmitted to **NGET** (to the relevant location in accordance with GC6) and must contain all the sections from the relevant part of Annexure~~s~~ 1 and **from either Annexure** 2 **or 3 (as applicable)** but with only the data changes set out. The "notification time" must be completed to refer to the time of transmission, where the time is expressed as London time.

(b) Upon receipt of the fax, **NGET** will acknowledge receipt by sending a fax back to the **User**. The acknowledgement will either state that the fax has been received and is legible or will state that it (or part of it) is not legible and will request re-transmission of the whole (or part) of the fax.

(c) Upon receipt of the acknowledging fax the **User** will, if requested, re-transmit the whole or the relevant part of the fax.

(d) The provisions of paragraphs (b) and (c) then apply to that re-transmitted fax.

APPENDIX 3 - ANNEXURE 1

Optional Logo

Company name REVISED Mvar DATA

TO: **NGET** Transmission Control Centre Fax telephone No.

Number of pages inc. header:.....

Sent By : .....

Return Acknowledgement Fax to .....

For Retransmission or Clarification ring.....

Acknowledged by **NGET**: (Signature)

.....

Acknowledgement time and date .....

Legibility of FAX : Acceptable ☐

Unacceptable ☐ (Resend FAX)
(List pages if appropriate)

APPENDIX 3 - ANNEXURE 2

To: **NGET** Transmission Control Centre

From : [*Company Name & Location*]

REVISED Mvar DATA – GENERATING UNITS EXCLUDING POWER PARK UNITS AND DC CONVERTERS

NOTIFICATION TIME:	HRS MINS DD MM YY . / /

GENERATING UNIT* ~~/POWER PARK MODULE~~ ~~DC CONVERTER~~	

Start Time/Date (if not effective immediately)

REACTIVE POWER CAPABILITY AT SYNCHRONOUS GENERATING UNIT STATOR TERMINAL (at rated terminal volts) ~~**OR AT THE CONNECTION POINT FOR OTHER GENSETS AND DC CONVERTERS**~~

	MW	LEAD (Mvar)	LAG (Mvar)
AT **RATED MW**			
AT FULL OUTPUT (MW)			
AT MINIMUM OUTPUT (MW)			

GENERATING UNIT STEP-UP TRANSFORMER DATA, WHERE APPLICABLE

TAP CHANGE RANGE (+%,-%)	TAP NUMBER RANGE

OPTIONAL INFORMATION (for Ancillary Services use only) **-**
REACTIVE POWER CAPABILITY AT COMMERCIAL BOUNDARY (at rated stator terminal and nominal system volts)

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

Predicted End Time/Date (to be confirmed by redeclaration)

Redeclaration made by (Signature) _____

Generating Unit has the meaning given in the Glossary and Definitions and is not limited by BC2.2.
* For a CCGT, the redeclaration is for an individual CCGT unit and not the entire module.

APPENDIX 3 - ANNEXURE 3

To: **NGET** Transmission Control Centre

From : [*Company Name & Location*]

REVISED Mvar DATA – POWER PARK UNITS AND DC CONVERTERS

NOTIFICATION TIME:

HRS MINS DD MM YY
____ . ____ / __ / __

POWER PARK MODULE/ DC CONVERTER	

Start Time/Date (if not effective immediately)

REACTIVE POWER CAPABILITY AT GRID ENTRY POINT (ENGLAND AND WALES) OR HV SIDE OF RELEVANT TRANSFORMER (SCOTLAND) OR USER SYSTEM ENTRY POINT (IF EMBEDDED) OF THE POWER PARK MODULE OR DC CONVERTER OR THE AGGREGATED CAPABILITY OF THE POWER PARK UNITS AT THE POWER PARK UNIT TERMINALS

	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			

Confirmation that the above figures are at **HV** ☐ or **LV** ☐

POWER PARK MODULE OR DC CONVERTER STEP-UP TRANSFORMER DATA, WHERE APPLICABLE

TAP CHANGE RANGE (+%,-%)	TAP NUMBER RANGE

Predicted End Time/Date (to be confirmed by redeclaration)

Redeclaration made by (Signature) _____

GRID CODE PCA.3 – CAP169 corresponding drafting

PC.A.3 **GENERATING UNIT AND DC CONVERTER DATA**

PC.A.3.1 Introduction

Directly Connected

PC.A.3.1.1 Each **Generator** and **DC Converter Station** owner with an existing, or proposed, **Power Station** or **DC Converter Station** directly connected, or to be directly connected, to the **GB Transmission System**, shall provide **NGET** with data relating to that **Power Station** or **DC Converter Station**, both current and forecast, as specified in PC.A.3.2 to PC.A.3.4.

Embedded

PC.A.3.1.2 (a) Each **Generator** and **DC Converter Station** owner in respect of its existing, and/or proposed, **Embedded Large Power Stations** and/or **Embedded DC Converter Stations** and/or its **Embedded Medium Power Stations** subject to a **Bilateral Agreement** and each **Network Operator** in respect of its **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** and/or **Embedded DC Converter Stations** not subject to a **Bilateral Agreement** within such **Network Operator's System** in each case connected to the **Subtransmission System**, shall provide **NGET** with data relating to that **Power Station** or **DC Converter Station,** both current and forecast, as specified in PC.A.3.2 to PC.A.3.4.

(b) No data need be supplied in relation to any **Small Power Station** or any **Medium Power Station** or installations of direct current converters which do not form a **DC Converter Station,** connected at a voltage level below the voltage level of the **Subtransmission System** except:-

(i) in connection with an application for, or under, a **CUSC Contract**, or

(ii) unless specifically requested by **NGET** under PC.A.3.1.4.

PC.A.3.1.3 (a) Each **Network Operator** shall provide **NGET** with the data specified in PC.A.3.2.2(c)**(i) and (ii)** and PC.A.3.2.2(i).

(b) **Network Operators** need not submit planning data in respect of an **Embedded Small Power Station** unless required to do so under PC.A.1.2(b) or unless specifically requested under PC.A.3.1.4 below, in which case they will supply such data.

PC.A.3.1.4 (a) PC.A.4.2.4(b) and PC.A.4.3.2(a) explain that the forecast **Demand** submitted by each **Network Operator** must be net of the output of all **Small Power Stations** and **Medium Power Stations** and **Customer Generating Plant** and all installations of direct current converters which do not form a **DC Converter Station**, **Embedded** within that **Network Operator's System**. The **Network Operator** must inform **NGET** of the number of such **Embedded Power Stations** and such **Embedded** installations of direct current converters (including the number of **Generating Units** or **Power**

Park Modules or **DC Converters**) together with their summated capacity.

(b) On receipt of this data, the **Network Operator** or **Generator** (if the data relates to **Power Stations** referred to in PC.A.3.1.2) may be further required, at **NGET's** reasonable discretion, to provide details of **Embedded Small Power Stations** and **Embedded Medium Power Stations** and **Customer Generating Plant** and **Embedded** installations of direct current converters which do not form a **DC Converter Station**, both current and forecast, as specified in PC.A.3.2 to PC.A.3.4. Such requirement would arise where **NGET** reasonably considers that the collective effect of a number of such **Embedded Power Stations** and **Customer Generating Plants** and **Embedded** installations of direct current converters may have a significant system effect on the **GB Transmission System**.

Busbar Arrangements

PC.A.3.1.5 Where **Generating Units**, which term includes **CCGT Units** and **Power Park Modules,** and **DC Converters,** are connected to the **GB Transmission System** via a busbar arrangement which is or is expected to be operated in separate sections, the section of busbar to which each **Generating Unit, DC Converter** or **Power Park Module** is connected is to be identified in the submission.

PC.A.3.2 Output Data

PC.A.3.2.1 (a) **Large Power Stations** and **Gensets**

Data items PC.A.3.2.2 (a), (b), (c), (d), (e), (f) and (h) are required with respect to each **Large Power Station** and each **Generating Unit** and **Power Park Module** of each **Large Power Station** and for each **Genset** (although (a) is not required for **CCGT Units** and (b), (d) and (e) are not normally required for **CCGT Units** and (a), (b), (c), (d), (e), (f) and (h) are not normally required for **Power Park Units**).

(b) **Embedded Small Power Stations** and **Embedded Medium Power Stations**

Data item PC.A.3.2.2 (a) is required with respect to each **Embedded Small Power Station** and **Embedded Medium Power Station** and each **Generating Unit** and **Power Park Module** of each **Embedded Small Power Station** and **Embedded Medium Power Station** (although (a) is not required for **CCGT Units** or **Power Park Units**). In addition, data item PC.A.3.2.2(c)(ii) is required with respect to each **Embedded Medium Power Station**.

(c) **CCGT Units/Modules**

(i) Data item PC.A.3.2.2 (g) is required with respect to each **CCGT Unit**;

(ii) data item PC.A.3.2.2 (a) is required with respect to each **CCGT Module**; and

(iii) data items PC.A.3.2.2 (b), (c), (d) and (e) are required with respect to each **CCGT Module** unless **NGET** informs the relevant **User** in advance of the submission that it needs the data items with respect to each **CCGT Unit** for particular studies, in which case it must be supplied on a **CCGT Unit** basis.

Where any definition utilised or referred to in relation to any of the data items does not reflect **CCGT Units**, such definition shall be deemed to relate to **CCGT Units** for the purposes of these data items. Any **Schedule** in the DRC which refers to these data items shall be interpreted to incorporate the **CCGT Unit** basis where appropriate;

(d) **Cascade Hydro Schemes**

Data item PC.A.3.2.2(i) is required with respect to each **Cascade Hydro Scheme**.

(e) **Power Park Units/Modules**

Data items PC.A.3.2.2 (j) is required with respect to each **Power Park Module.**

(f) **DC Converters**

Data items PC.A.3.2.2 (a), (b), (c), (d) (e) (f) (h) and (i) are required with respect to each **DC Converter Station** and each **DC Converter** in each **DC Converter Station.** For installations of direct current converters which do not form a **DC Converter Station** only data item PC.A.3.2.2.(a) is required.

PC.A.3.2.2 Items (a), (b), (d), (e), (f), (g), (h), (i), (j) and (k) are to be supplied by each **Generator , DC Converter Station** owner or **Network Operator** (as the case may be) in accordance with PC.A.3.1.1, PC.A.3.1.2, PC.A.3.1.3 and PC.A.3.1.4. Item (c) is to be supplied by each **Network Operator** in all cases:-

(a) **Registered Capacity** (MW);

(b) **Output Usable** (MW) on a monthly basis;

(c) with respect to any **Embedded Generating Unit, Embedded Power Park Module** or **DC Converter** at an **Embedded DC Converter Station**:-

(i) **System Constrained Capacity** (MW) ie. any constraint placed on the capacity of the **Embedded Generating Unit, Embedded Power Park Module,** or **DC Converter** at an **Embedded DC Converter Station** due to the **Network Operator's System** in which it is embedded. Where **Generating Units** (which term includes **CCGT Units**), **Power Park Modules** or **DC Converters** are connected to a **Network Operator's User System** via a busbar arrangement which is or is expected to be operated in separate sections, details of busbar running arrangements and connected circuits at the substation to which the **Embedded Generating Unit**, **Embedded Power Park Module** or **Embedded DC Converter** is connected sufficient for **NGET** to determine where the **MW** generated by each **Generating Unit**, **Power Park Module** or **DC Converter** at that **Power Station** or **DC Converter Station** would appear onto the **GB Transmission System**;

(ii) any **Reactive Despatch Network Restrictions**;

(d) **Minimum Generation** (MW);

(e) MW obtainable from **Generating Units, Power Park Modules** or **DC Converters** at a **DC Converter Station** in excess of **Registered Capacity**;

(f) **Generator Performance Chart:**

(i) at the **Synchronous Generating Unit** stator terminals

(ii) at the electrical point of connection to the **GB Transmission System** (or **User System** if **Embedded**) for a **Non Synchronous Generating Unit** (excluding a **Power Park Unit), Power Park Module** and **DC Converter** at a **DC Converter Station**;

Where a **Reactive Despatch Network Restriction** applies, its existence and details should be highlighted on the **Generator Performance Chart**, in sufficient detail for **NGET** to determine the nature of the restriction;

(g) a list of the **CCGT Units** within a **CCGT Module**, identifying each **CCGT Unit**, and the **CCGT Module** of which it forms part, unambiguously. In the case of a **Range CCGT Module**, details of the possible configurations should also be submitted, together:-

(i) (in the case of a **Range CCGT Module** connected to the **GB Transmission System)** with details of the single **Grid Entry Point** (there can only be one) at which power is provided from the **Range CCGT Module**;

(ii) (in the case of an **Embedded Range CCGT Module**) with details of the single **User System Entry Point** (there can only be one) at which power is provided from the **Range CCGT Module**;

Provided that, nothing in this sub-paragraph (g) shall prevent the busbar at the relevant point being operated in separate sections;

(h) expected running regime(s) at each **Power Station** or **DC Converter Station** and type of **Generating Unit**, eg. **Steam Unit**, **Gas Turbine Unit**, **Combined Cycle Gas Turbine Unit**, **Power Park Module, Novel Units** (specify by type), etc;

(i) a list of **Power Stations** and **Generating Units** within a **Cascade Hydro Scheme**, identifying each **Generating Unit** and **Power Station** and the **Cascade Hydro Scheme** of which each form part unambiguously. In addition:

(i) details of the **Grid Entry Point** at which **Active Power** is provided, or if **Embedded** the **Grid Supply Point(s)** within which the **Generating Unit** is connected;

(ii) where the **Active Power** output of a **Generating Unit** is split between more than one **Grid Supply Points** the percentage that would appear under normal and outage conditions at each **Grid Supply Point**.

(j) The following additional items are only applicable to **DC Converters** at **DC Converter Stations**.

Registered Import Capacity (MW);

Import Usable (MW) on a monthly basis;

Minimum Import Capacity (MW);

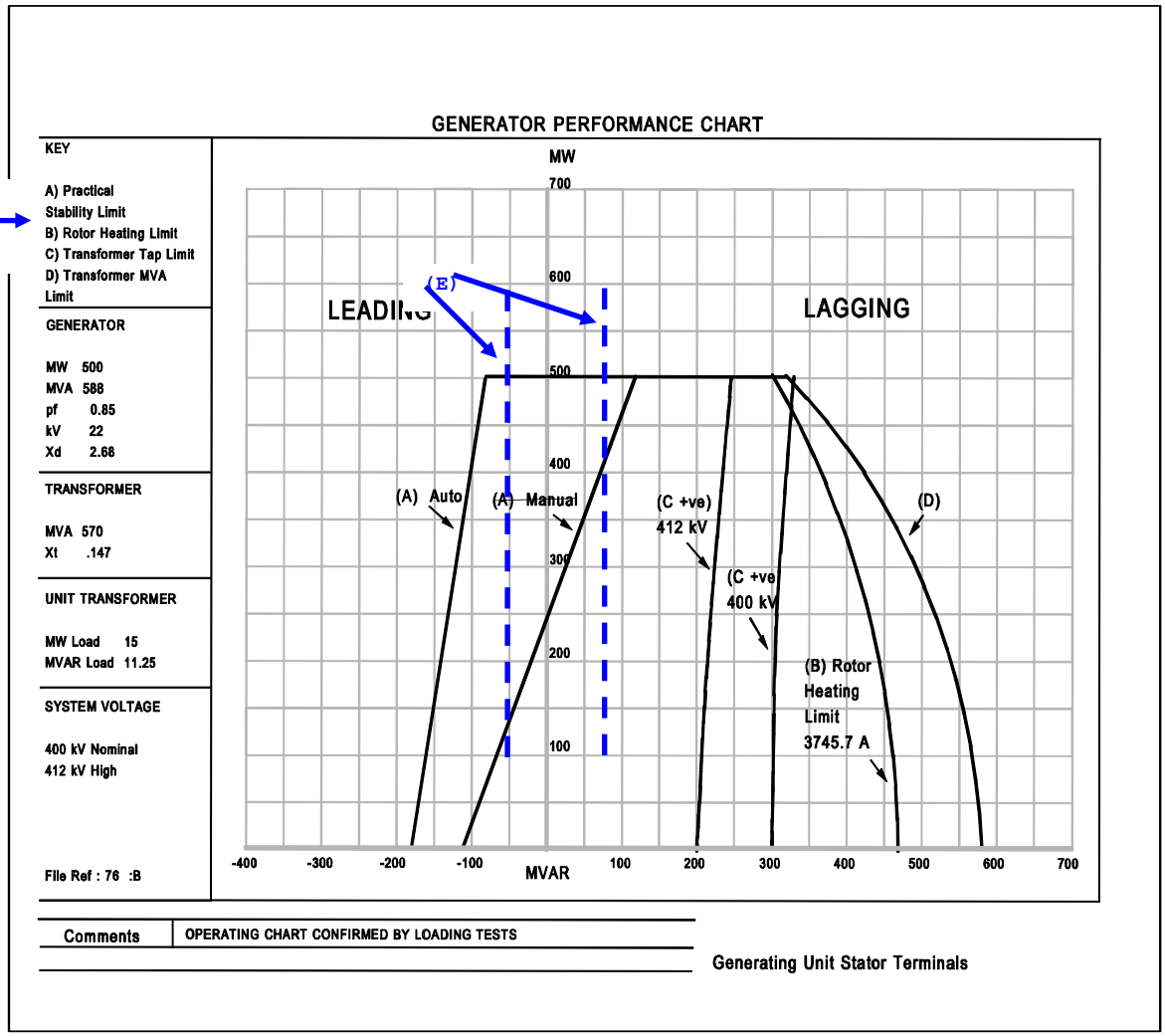
MW that may be absorbed by a **DC Converter** in excess of **Registered Import Capacity** and the duration for which this is available;

(k) the number and types of the **Power Park Units** within a **Power Park Module**, identifying each **Power Park Unit**, and the **Power Park Module** of which it forms part, unambiguously. In the case of a **Power Station** directly connected to the **GB Transmission System** with multiple **Power Park Modules** where **Power Park Units** can be selected to run in different **Power Park Modules**, details of the possible configurations should also be submitted.

GRID CODE OC2 Appendix 1 – CAP169 corresponding changes

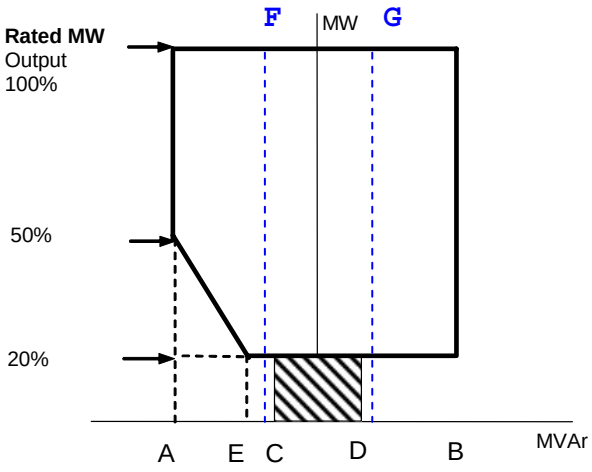
OC2, Appendix 1

(E) User System



GRID CODE OC2 Appendix 1 – CAP169 corresponding changes

POWER PARK MODULE PERFORMANCE CHART
AT THE CONNECTION POINT OR USER'S SYSTEM ENTRY POINT



LEADING LAGGING

Point A is equivalent (in MVAr) to: 0.95 leading **Power Factor** at **Rated MW** output
Point B is equivalent (in MVAr) to: 0.95 lagging **Power Factor** at **Rated MW** output
Point C is equivalent (in MVAr) to: -5% of **Rated MW** output
Point D is equivalent (in MVAr) to: +5% of **Rated MW** output
Point E is equivalent (in MVAr) to: -12% of **Rated MW** output
Line F is equivalent (in MVAr) to: Leading **Power Factor Reactive Despatch Network Restriction**
Line G is equivalent (in MVAr) to: Lagging **Power Factor Reactive Despatch Network Restriction**

DATA REGISTRATION CODE

SCHEDULE 11
Page 1 of 2

CONNECTION POINT DATA

The following information is required from each **Network Operator** and from each **Non-Embedded Customer**. The data should be provided in calendar week 24 each year (although **Network Operators** may delay the submission until calendar week 28).

Connection Point: _____

Connection Point Demand at the time of - (select each one in turn) (Provide data for each Access Period associated with the Connection Point)	a) maximum **Demand** b) peak **GB Transmission System Demand** *(specified by **NGET**)* c) minimum **GB Transmission System Demand** *(specified by **NGET**)* d) maximum **Demand** during **Access Period** e) specified by either **NGET** or a **User**	
Name of **Transmission Interface Circuit** out of service during **Access Period** *(if reqd)*.		**PC.A.4.1.4.2**

DATA DESCRIPTION *(CUSC Contract □ & CUSC Application Form ■)*	Outturn	Outturn Weather Corrected	F.Yr 1	F.Yr 2	F.Yr. 3	F.Yr. 4	F.Yr. 5	F.Yr 6	F.Yr 7	F.Yr 8	DATA CAT
Date of a), b), c), d) or e) as denoted above.											**PC.A.4.3.3**
Time of a), b), c), d) or e) as denoted above.											**PC.A.4.3.3**
Connection Point Demand (MW)											**PC.A.4.3.1**
Connection Point Demand (MVAr)											**PC.A.4.3.1**
Deduction made at **Connection Point** for **Small Power Stations**, **Medium Power Stations** and **Customer Generating Plant** (MW)											**PC.A.4.3.2(a)**
Reference to valid **Single Line Diagram**											**PC.A.4.3.5**
Reference to node and branch data.											**PC.A.2.2**

Note: The following data block can be repeated for each post fault network revision that may impact on the Transmission System.

Reference to post-fault revision of **Single Line Diagram**											**PC.A.4.5**
Reference to post-fault revision of the node and branch data associated with the **Single Line Diagram**											**PC.A.4.5**
Reference to the description of the actions and timescales involved in effecting the post-fault actions (e.g. auto-switching, manual, teleswitching, overload protection operation etc)											**PC.A.4.5**

Access Group:		

*Note: The following data block to be repeated for each **Connection Point** with the **Access Group**.*

Name of associated **Connection Point** within the same **Access Group:**											**PC.A.4.3.1**
Demand at associated **Connection Point** (MW)											**PC.A.4.3.1**
Demand at associated **Connection Point** (MVAr)											**PC.A.4.3.1**
Deduction made at associated **Connection Point** for **Small Power Stations**, **Medium Power Stations** and **Customer Generating Plant** (MW)											**PC.A.4.3.2(a)**

Embedded Generation Data											
Connection Point:											
DATA DESCRIPTION	Outturn	Outturn Weather Corrected	F.Yr 1	F.Yr 2	F.Yr. 3	F.Yr. 4	F.Yr. 5	F.Yr 6	F.Yr 7	F.Yr 8	DATA CAT
Small Power Station, Medium Power Station and **Customer** Generation Summary	For each **Connection Point** where there are **Embedded Small Power Stations, Medium Power Stations** or **Customer Generating Stations** the following information is required:										
No. of **Small Power Stations, Medium Power Stations** or **Customer Power Stations**											**PC.A.3.1.4(a)**
Number of **Generating Units** within these stations											**PC.A.3.1.4(a)**
Summated Capacity of all these **Generating Units**											**PC.A.3.1.4(a)**

Where the **Network Operator's System** places a constraint on the capacity of an **Embedded Large Power Station**											
Station Name											**PC.A.3.2.2(c)(i)**
Generating Unit											**PC.A.3.2.2(c)(i) and (ii)**
System Constrained Capacity											**PC.A.3.2.2(c)(i) and (ii)**
Reactive Despatch Network Restriction											**PC.A.3.2.2(c)(ii)**

NOTES:

1. 'F.Yr.' means '**Financial Year**'. F.Yr. 1 refers to the current financial year.

2. All **Demand** data should be net of the output (as reasonably considered appropriate by the **User**) of all **Embedded Small Power Stations, Medium Power Stations** and **Customer Generating Plant**. Generation and / or Auxiliary demand of **Embedded Large Power Stations** should not be included in the demand data submitted by the **User**. **Users** should refer to the **PC** for a full definition of the **Demand** to be included.

3. Peak **Demand** should relate to each **Connection Point** individually and should give the maximum demand that in the **User's** opinion could reasonably be imposed on the **GB Transmission System**. **Users** my submit the **Demand** data at each node on the **Single Line Diagram** instead of at a **Connection Point** as long the user reasonably believe such data relates to the peak (or minimum) at the **Connection Point**.

   In deriving **Demand** any deduction made by the **User** (as detailed in note 2 above) to allow for **Embedded Small Power Stations, Medium Power Stations** and **Customer Generating Plant** is to be specifically stated as indicated on the Schedule.

4. **NGET** may at its discretion require details of any **Embedded Small Power Stations** or **Embedded Medium Power Stations** whose output can be expected to vary in a random manner (eg. wind power) or according to some other pattern (eg. tidal power)

5. Where more than 95% of the total **Demand** at a **Connection Point** is taken by synchronous motors, values of the **Power Factor** at maximum and minimum continuous excitation may be given instead. **Power Factor** data should allow for series reactive losses on the **User's System** but exclude reactive compensation network susceptance specified separately in Schedule 5.

GLOSSARY AND DEFINITIONS

Commercial Boundary	Has the meaning set out in the **CUSC**
Reactive Despatch Instruction	Has the meaning set out in the **CUSC**
Reactive Despatch Network Restriction	A restriction placed upon an **Embedded Generating Unit**, **Embedded Power Park Module** or **DC Converter** at an **Embedded DC Converter Station** by the **Network Operator** that prevents the **Generator** or **DC Converter Station** owner in question (as applicable) from complying with any **Reactive Despatch Instruction** with respect to that **Embedded Generating Unit**, **Embedded Power Park Module** or **DC Converter** at an **Embedded DC Converter Station**, whether to provide zero Mvars at the **Commercial Boundary** or to provide Mvars over the full range referred to in CC 6.3.2 or otherwise.

PART E - PROPOSED LEGAL TEXT TO MODIFY THE GRID CODE - Text to give effect to the CUSC draft Working Group Alternative Amendment 1

Please note this legal text is draft for the purposes of the Working Group Consultation and has not been fully agreed by the Working Group.

In addition to the changes proposed for the Grid Code with regards the original CAP169 (as outlined in Part D of Working Group Consultation Volume 2) draft WGAA1 will require additional Grid Code changes to be introduced to facilitate communication of operational restrictions, with the proposal to amend BC1.6 and BC2 Appendix 3.

1 – BC1.6

2 – BC2 Appendix 3

BC1.6 Special Provisions relating to **Network Operators**

BC1.6.1 **User System** Data from **Network Operators**

(a) Subject to (d) below, By 1000 hours each day each **Network Operator** will submit to **NGET** in writing, confirmation or notification of the following in respect of the next **Operational Day**:

(i) constraints on its **User System** which **NGET** may need to take into account in operating the **GB Transmission System**. In this BC1.6.1 the term "constraints" shall include restrictions on the operation of **Embedded CCGT Units,** and/or **Embedded Power Park Modules** as a result of the **User System** to which the **CCGT Unit** and/or **Power Park Module** is connected at the **User System Entry Point** being operated or switched in a particular way, for example, splitting the relevant busbar. It is a matter for the **Network Operator** and the **Generator** to arrange the operation or switching, and to deal with any resulting consequences. The **Generator,** after consultation with the **Network Operator**, is responsible for ensuring that no **BM Unit Data** submitted to **NGET** can result in the violation of any such constraint on the **User System**.

(ii) the requirements of voltage control and Mvar reserves which **NGET** may need to take into account for **System** security reasons.

(b) The form of the submission will be:

(i) that of a **BM Unit** output or consumption (for MW and for Mvar, in each case a fixed value or an operating range, on the **User System** at the **User System Entry Point**, namely in the case of a **BM Unit** comprising a **Generating Unit** (as defined in the Glossary and Definitions and not limited by BC1.2) on the higher voltage side of the generator step-up transformer, or in the case of a **Power Park Module**, at the point of connection) required for particular **BM Units** (identified in the submission) connected to that **User System** for each **Settlement Period** of the next **Operational Day**;

(ii) adjusted in each case for MW by the conversion factors applicable for those **BM Units** to provide output or consumption at the relevant **Grid Supply Points**.

(c) At any time and from time to time, between 1000 hours each day and the expiry of the next **Operational Day**, each **Network Operator** must submit to **NGET** in writing any revisions to the information submitted under this BC1.6.1.

(d) Where a **Network Operator** wishes to submit to **NGET** in writing a single confirmation or notification of constraints on its **User System** and/or requirements of voltage control and Mvar reserve with respect to more than one **Operational Day**, then the form of the submission will be:

(i) that of a **BM Unit** output or consumption (for MW and for Mvar, in each case a fixed value or an operating range, on the **User System**

at the **User System Entry Point**, namely in the case of a **BM Unit** comprising a **Generating Unit** (as defined in the Glossary and Definitions and not limited by BC1.2) on the higher voltage side of the generator step-up transformer, or in the case of a **Power Park Module**, at the point of connection) required for particular **BM Units** (identified in the submission) connected to that **User System**, together with the **Network Operator**'s best estimate of the duration of that restriction;

(ii) adjusted in each case for MW by the conversion factors applicable for those **BM Units** to provide output or consumption at the relevant **Grid Supply Points**.

(e) The confirmation or notification made in accordance with BC1.6.1(d) will be considered applicable until such time as a revision to the information submitted under BC1.6.1(d) has been received by **NGET** in writing from the relevant **Network Operator**.

BC1.6.2 Notification of Times to **Network Operators**

NGET will make available indicative **Synchronising** and **De-Synchronising** times to each **Network Operator**, but only relating to **BM Units** comprising a **Generating Unit** (as defined in the Glossary and Definitions and not limited by BC1.2) or a **Power Park Module** or a **CCGT Module Embedded** within that **Network Operator's User System** and those **Gensets** directly connected to the **GB Transmission System** which **NGET** has identified under **OC2** as being those which may, in the reasonable opinion of **NGET**, affect the integrity of that **User System**. If in preparing for the operation of the **Balancing Mechanism**, **NGET** becomes aware that a **BM Unit** directly connected to the **GB Transmission System** may, in its reasonable opinion, affect the integrity of that other **User System** which, in the case of a **BM Unit** comprising a **Generating Unit** (as defined in the Glossary and Definitions and not limited by BC1.2) or a **CCGT Module** or a **Power Park Module,** it had not so identified under **OC2**, then **NGET** may make available details of its indicative **Synchronising** and **De-Synchronising** times to that other **User** and shall inform the relevant **BM Participant** that it has done so, identifying the **BM Unit** concerned.

Appendix 3 – Submission of Revised Mvar Capability

BC2.A.3.1 For the purpose of submitting revised Mvar data the following terms shall apply:

Full Output	In the case of a **Synchronous Generating Unit** (as defined in the Glossary and Definitions and not limited by BC2.2) is the MW output measured at the generator stator terminals representing the LV equivalent of the **Registered Capacity** at the **Grid Entry Point**, and in the case of a **Non-Synchronous Generating Unit** (excluding **Power Park Units**), **DC Converter** or **Power Park Module** is the **Registered Capacity** at the **Grid Entry Point**
Minimum Output	In the case of a **Synchronous Generating Unit** (as defined in the Glossary and Definitions and not limited by BC2.2) is the MW output measured at the generator stator terminals representing the LV equivalent of the **Minimum Generation** at the **Grid Entry Point**, and in the case of a **Non-Synchronous Generating Unit** (excluding **Power Park Units**), **DC Converter** or **Power Park Module** is the **Minimum Generation** at the **Grid Entry Point**

BC2.A.3.2 The following provisions apply to faxed submission of revised Mvar data:

(a) The fax must be transmitted to **NGET** (to the relevant location in accordance with GC6) and must contain all the sections from the relevant part of Annexure~~s~~ 1 and **from either Annexure** 2 **or 3 (as applicable)** but with only the data changes set out. The "notification time" must be completed to refer to the time of transmission, where the time is expressed as London time.

(b) Upon receipt of the fax, **NGET** will acknowledge receipt by sending a fax back to the **User**. The acknowledgement will either state that the fax has been received and is legible or will state that it (or part of it) is not legible and will request re-transmission of the whole (or part) of the fax.

(c) Upon receipt of the acknowledging fax the **User** will, if requested, re-transmit the whole or the relevant part of the fax.

(d) The provisions of paragraphs (b) and (c) then apply to that re-transmitted fax.

APPENDIX 3 - ANNEXURE 1

Optional Logo

Company name REVISED Mvar DATA

TO: **NGET** Transmission Control Centre Fax telephone No.

Number of pages inc. header:.....

Sent By : .....

Return Acknowledgement Fax to .....

For Retransmission or Clarification ring.....

Acknowledged by **NGET**: (Signature)

.....

Acknowledgement time and date .....

Legibility of FAX : Acceptable ☐

Unacceptable ☐ (Resend FAX)
(List pages if appropriate)

APPENDIX 3 - ANNEXURE 2

To: **NGET** Transmission Control Centre

From : [*Company Name & Location*]

REVISED Mvar DATA – GENERATING UNITS EXCLUDING POWER PARK UNITS AND DC CONVERTERS

NOTIFICATION TIME:	HRS MINS DD MM YY . / /

GENERATING UNIT* ~~/POWER PARK MODULE DC CONVERTER~~	

Start Time/Date (if not effective immediately)

REACTIVE POWER CAPABILITY AT SYNCHRONOUS GENERATING UNIT STATOR TERMINAL (at rated terminal volts) ~~**OR AT THE CONNECTION POINT FOR OTHER GENSETS AND DC CONVERTERS**~~

	MW	LEAD (Mvar)	LAG (Mvar)
AT **RATED MW**			
AT FULL OUTPUT (MW)			
AT MINIMUM OUTPUT (MW)			

GENERATING UNIT STEP-UP TRANSFORMER DATA, WHERE APPLICABLE

TAP CHANGE RANGE (+%,-%)	TAP NUMBER RANGE

OPTIONAL INFORMATION (for Ancillary Services use only) **-**
REACTIVE POWER CAPABILITY AT COMMERCIAL BOUNDARY (at rated stator terminal and nominal system volts)

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

Predicted End Time/Date (to be confirmed by redeclaration)

This is a **REACTIVE DESPATCH NETWORK RESTRICTION** (please tick if appropriate) ☐

Redeclaration made by (Signature) _____

Generating Unit has the meaning given in the Glossary and Definitions and is not limited by BC2.2.

* For a CCGT, the redeclaration is for an individual CCGT unit and not the entire module.

APPENDIX 3 - ANNEXURE 3

To: **NGET** Transmission Control Centre

From : [*Company Name & Location*]

REVISED Mvar DATA – POWER PARK UNITS AND DC CONVERTERS

HRS MINS DD MM YY
. / /

NOTIFICATION TIME:

POWER PARK MODULE/ DC CONVERTER	

Start Time/Date (if not effective immediately)

REACTIVE POWER CAPABILITY AT GRID ENTRY POINT (ENGLAND AND WALES) OR HV SIDE OF RELEVANT TRANSFORMER (SCOTLAND) OR USER SYSTEM ENTRY POINT (IF EMBEDDED) OF THE POWER PARK MODULE OR DC CONVERTER OR THE AGGREGATED CAPABILITY OF THE POWER PARK UNITS AT THE POWER PARK UNIT TERMINALS

	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			

Confirmation that the above figures are at **HV** ☐ or **LV** ☐

POWER PARK MODULE OR DC CONVERTER STEP-UP TRANSFORMER DATA, WHERE APPLICABLE

TAP CHANGE RANGE (+%,-%)	TAP NUMBER RANGE

Predicted End Time/Date (to be confirmed by redeclaration)

This is a **REACTIVE DESPATCH NETWORK RESTRICTION** (please tick if appropriate) ☐

Redeclaration made by (Signature) _____

PART F - PROPOSED CHANGES TO THE METHODOLOGY FOR THE AGGREGATION OF REACTIVE POWER METERING

CHANGES UNDERLINED AND MARKED IN BLUE

OBLIGATORY AND ENHANCED REACTIVE POWER SERVICES

Methodology Document for the Aggregation of Reactive Power Metering

May 2009 ~~April 2007~~

Network Operations
National Grid
National Grid House
Warwick Technology Park
Gallows Hill
Warwick
CV34 6DA

CONTENTS

PAGE

Date of issue 18th May 2009

1. DEFINITIONS AND INTERPRETATIONS

National Grid Electricity Transmission plc ("The Company") is a member of the National Grid plc group of companies. National Grid is the trading name for National Grid plc.

In this document, except where the context otherwise requires, terms and expressions found in Schedule 3 to the Connection and Use of System Code (CUSC) have the same meanings, interpretations and constructions.

For the avoidance of doubt in this document, when considering the circuits that connect any source of Reactive Power to the GB Transmission System, the terms "leading reactive energy" and "lagging reactive energy" refer to "Mvarh import value" and "Mvarh export value" respectively, as defined in Appendix B of the Metering Codes of Practice 1 & 2[1] entitled "Labelling of Meters for Import and Export". The Metering Codes of Practice can be found on the Elexon website at:

http://www.elexon.co.uk/bscrelateddocs/codesofpractice/default.aspx

2. INTRODUCTION

This document contains the metering aggregation methodologies for use in calculating the payments for the provision of either an Obligatory or Enhanced Reactive Power Service from any reactive power equipment including, for the avoidance of doubt, BM Units, Non-BM Units, Generating Units, **Power Park Modules** and other Plant and Apparatus or equipment.

The various meter aggregation methodologies set out in this document (as amended or supplemented from time to time) are designed to simulate, as far as reasonably practicable, the presence of a single meter at the Commercial Boundary in order to ascertain, in respect of reactive power equipment, the Mvarh import and Mvarh export values to be used in the calculation of payments to be made by The Company for reactive power produced by the reactive power equipment.

Where the reactive power equipment has a single meter located at or close to the Commercial Boundary, there is no requirement to apply any of the aggregation methodologies contained in this document and payments will be based on the actual recorded reading of the meter. In these cases, the provisions relating to meter aggregation in the relevant Ancillary Services Agreement will be designated "Not Applicable".

1Entitled on the web site as "The metering of circuits with a rated capacity exceeding 100 MVa for settlement purposes" (Metering Codes of Practice 1) & "The metering of circuits with a rated capacity exceeding 100 MVa for settlement purposes" (Metering Codes of Practice 2)

Reactive power equipment can comprise inter alia:-

a) a single Generating Unit, Plant or Apparatus, with its own connection via a transformer to the Commercial Boundary with the GB Transmission System or the Distribution System of the host Public Distribution System Operator (PDSO)
b) a BM Unit comprising several separate Generating Units **or Power Park Units**. For example a combined cycle gas turbine module (CCGT Module) either directly connected or within an embedded power station, **or a Power Park Module**
c) a BM Unit comprising a single Generating Unit which shares a transformer or other connection to the Commercial Boundary with another Generating Unit
d) one of the above but with more than one possible route of connection to the Commercial Boundary

As at **May 2009 ~~April 2007~~**, four distinct Metering System configurations in respect of reactive power equipment have been identified as necessary as specified in sub-paragraph 2.4 of Appendix 4 of Schedule 3 to the CUSC. This document sets out below the four methodologies (referred to in this document as "Categories A, B, C and D") which can be applied to these specific Metering System configurations.

3. CATEGORY A

This category covers the following cases:-

(i) The reactive power equipment is metered by **one** set of Metering Equipment providing the Mvarh import and export values, which is located at the low voltage side of a generator step-up transformer.

(ii) The reactive power equipment is metered by **one** set of Metering Equipment providing the Mvarh import and export values, which is located at the high voltage side of the generator step-up transformer, but physically remote from the Commercial Boundary.

The following two figures illustrate the two cases described above to which the Category A methodology described below can be applied. For illustrative purposes only, the reactive power equipment is a BM Unit represented as a single Generating Unit in figure (i) and several Generating Units**/ Power Park Units** within a CCGT Module**/ Power Park Module** in figure (ii), each with meters located at points marked "M".

Figure (i) Metering Equipment positioned at the low voltage side of the generator step-up transformer.

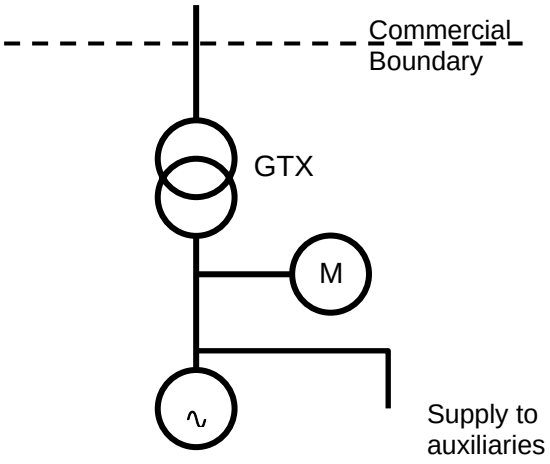
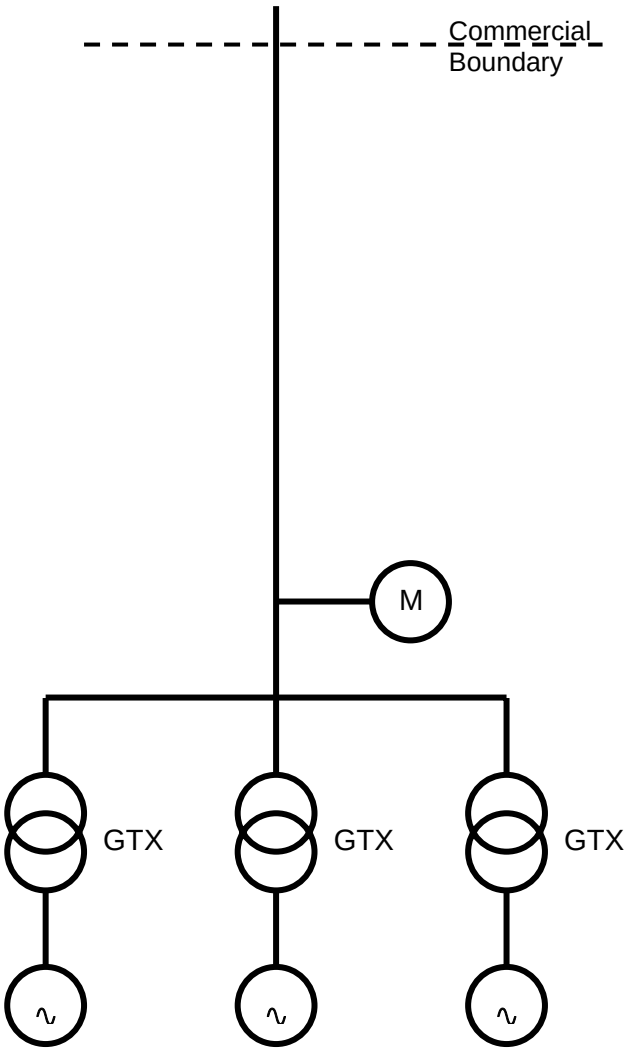


Figure (ii) Metering Equipment positioned at the high voltage side of the generator step-up transformer, but at a distance from the Commercial Boundary.



Methodology

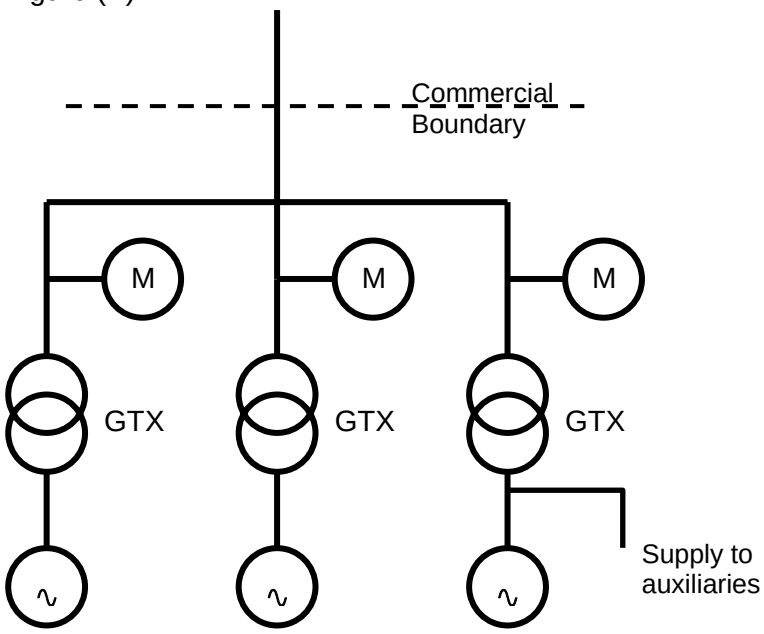
No meter aggregation is required. However, in order to provide Mvarh import and Mvarh export values for the reactive power equipment at the Commercial Boundary, appropriate loss adjustment factors must be agreed between the User and The Company. In some cases, and subject to agreement, it may be possible to perform the adjustment within the Metering Equipment itself. If not, the governing principles for any Meter loss adjustment will be the same as those used in the LV to HV conversion formulae used for the calculation of Reactive Power capability at the Commercial Boundary as specified in the relevant Ancillary Services Agreement.

4. CATEGORY B

This category covers the case where the reactive power equipment has two or more Meters measuring Mvarh import and export values. This includes the following cases:

- The reactive power equipment is a BM Unit comprising a single CCGT Module or an embedded power station made up of several Generating Units**/ Power Park Units**, each with its own Meter located at the High Voltage side of the transformer.
- Where any one or more of the Meters is not positioned at or close to the Commercial Boundary then a method of Meter loss adjustment must first be agreed in accordance with the Category A methodology above. The adjusted Meter readings derived applying the Category A methodology will then be used in the aggregation methodology described below.

Figure (iii)



Methodology

In order to reflect possible Reactive Power imbalances across the metered points, two aggregation methodologies will apply, namely *linear addition* and *separation of totals.*

LINEAR ADDITION

Linear addition is the straight forward addition of the readings of the Mvarh leading and Mvarh lagging Meters at each metered point to give total Mvarh leading and Mvarh lagging reactive energy readings respectively. Linear addition is only applicable when all the meter values for a Settlement Period are in the same sense (i.e. providing all leading or all lagging reactive energy), or when both the leading and lagging meter values for the Settlement Period are reasonably balanced across all the metered points. Hence its application is limited to the following specific circumstances when, during a Settlement Period all Generating Units or embedded loads within the BM Unit are supplying in:-

(a) always lagging (or zero) reactive energy; or

(b) always leading (or zero) reactive energy; or

(c) successive leading and lagging reactive energy or vice-versa, where both the leading and lagging values are each reasonably balanced.

SEPARATION OF TOTALS

In all other circumstances, separation of totals should be used to avoid the inclusion of Reactive Power which is circulating between individual Generating Units. By applying this aggregation methodology, the total of the metered leading reactive energy is subtracted from the total of the metered lagging reactive energy.

If the result is positive then the total is considered to be lagging reactive energy, and the lagging reactive energy for the BM Unit, (i.e. the CCGT Module **or Power Park Module** or embedded power station), is equal to the numeric value of the result and leading reactive energy is deemed to be zero.

If the result is negative then the total is considered to be leading reactive energy, and the leading reactive energy for the BM Unit, (i.e. the CCGT Module **or Power Park Module** or embedded power station), is equal to the numeric value of the result and lagging reactive energy is deemed to be zero.

The mathematical definitions of both the linear addition methodology and the separation of totals methodology are stated below, with the variables used in the mathematical definitions having the following definitions:-

n	The total number of units
$lead_{total}$	The calculated leading reactive energy in a Settlement Period for a BM Unit, in Mvarh (a positive number or zero)
lag_{total}	The calculated lagging reactive energy in a Settlement Period for a BM Unit, in Mvarh (a positive number or zero)

$lead_i$ The metered leading reactive energy in a Settlement Period for the *i*th unit within a BM Unit, in Mvarh (a positive number or zero)

lag_i The metered lagging reactive energy in a Settlement Period for the *i*th unit within a BM Unit, in Mvarh (a positive number or zero)

total A variable defined in the equations below which can be positive, negative or zero.

Linear Addition

$$lead_{total} = \sum_{i=1}^{n} lead_i$$

$$lag_{total} = \sum_{i=1}^{n} lag_i$$

Separation of Totals

$$total = \sum_{i=1}^{n} lag_i - \sum_{i=1}^{n} lead_i$$

If total >0

then

lag_{total} = total

$lead_{total}$ = 0

otherwise

lag_{total} = 0

$lead_{total}$ = |total|

Application Criteria for Linear Addition

Linear Addition will be applied where either:

(i) [$max(lag_i) = 0$ or $max(lead_i) = 0$]

(All Generating Units providing lagging (or zero) reactive energy or all Generating Units providing leading (or zero) reactive energy)

or:

(ii) [$min(lag_i) > 0$ and $min(lead_i) > 0$]

(All Generating Units providing both leading and lagging reactive energy where the group of leading and lagging metered values are such that the maximum group value is no greater than 1.1 times the minimum group value)

ie: maximum lagging metered value Ω 1.1 x minimum lagging metered value

maximum leading metered value Ω 1.1 x minimum leading metered value.

Otherwise separation of totals is the applicable methodology, rather than Linear Addition.

5. CATEGORY C

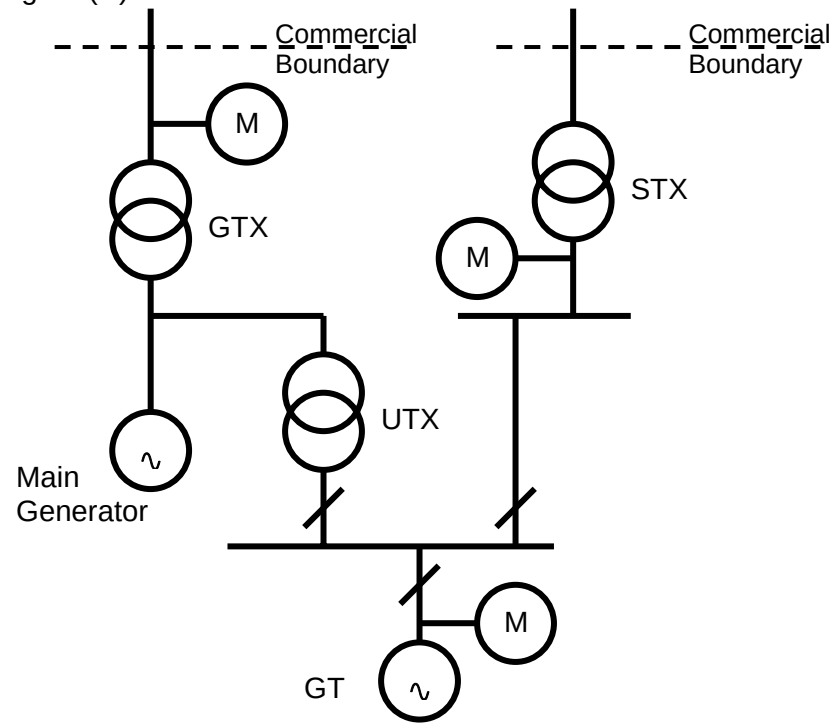
The following meter aggregation methodologies cover those cases where the reactive power equipment is an auxiliary gas turbine generating unit (GT), connected to the unit auxiliary board of a main Generating Unit.

In such cases the export from the GT is either via the unit (UTX) / generator (GTX) step-up transformer when the main Generating Unit is synchronised or via power station interconnectors and the station (STX) step-up transformer when the main Generating Unit is not synchronised. Figure (iv) shows one such arrangement and indicates the typical position of the Reactive Power Meters.

By applying tests to determine whether both or only one of the main Generating Unit and the GT are synchronised, the appropriate Meter loss adjustment and Meter aggregation methodologies for the operating conditions are determined.

When the GT is synchronised it may be producing both active and reactive power or operating as a synchronous compensator producing only reactive power.

Figure (iv)



In order to provide Mvarh import and Mvarh export values for the GT at the HV side of the generator and station step-up transformers when both the main Generating Unit and/or the GT are synchronised, appropriate Meter loss adjustment factors are required to be applied to the GT Meter readings. These will be dependent upon actual site/plant arrangement and agreed reference operating conditions. These will be subject to agreement on a site by site basis between The Company and the User.

Methodology

The main Generating Unit is identified as synchronised by the condition $A_{ij} > 5MWh$ in a Settlement Period.

The GT is identified as synchronised by the metered Mvarh import or export value, measured at the GT Meter, being greater than 2.5 Mvarh in a Settlement Period.

Let:

Grlag and Grlead	=	the Mvarh export and import values at the HV side of the generator step-up transformer.
Gtlagcomp and Gtleadcomp	=	the Mvarh export and import values of the GT as adjusted to the values at the Commercial Boundary by the application of a Meter loss adjustment factor based on a “predominant reactive energy flow

path", agreed between The Company and the User for that Meter. (ie One Meter loss adjustment factor will apply for export values and one Meter loss adjustment factor will apply to import values whether the reactive flow is via the generator or station step-up transformer.)

Three case scenarios are dealt with below

1. Where only the main Generating Unit is synchronised:-

   Payments will be made for the main Generating Unit only and will be calculated utilising the Grlag and/or Grlead Mvarh export and import values at the main Generating Unit payment rate.

2. Where only the GT is synchronised:-

   Payments will be made for the GT only and will be calculated utilising the appropriate GT Mvarh export and import values, adjusted in accordance with the appropriate meter loss adjustment factor at the GT payment rate.

3. Where both the main Generating Unit and the GT are synchronised:-

   (a) Where Grlag ΔGtlagcomp

   Payments will be calculated as follows:-

   i) For the main Generating Unit, (Grlag-Gtlagcomp) Mvarh export values at the main Generating Unit payment rate, and

   ii) For the GT, Gtlagcomp Mvarh export value at the GT payment rate.

   (b) Where Grlag < Gtlagcomp

   i) For the main Generating Unit, (Grlag-Gtlagcomp) Mvarh export values will be zero and so no payment will be due at the main Generating Unit payment rate, and

   ii) For the GT, Gtlagcomp Mvarh export value at the GT payment rate.

   (c) Where Grlead ΔGtleadcomp

   Payments will be calculated as follows:-

   i) For the main Generating Unit, (Grlead-Gtleadcomp) Mvarh import values at the main Generating Unit payment rate, and

   ii) For the GT, Gtleadcomp Mvarh import value at the GT payment rate.

(d) Where Grlead < Gtleadcomp

i) For the main Generating Unit, (Grlead-Gtleadcomp) Mvarh export values will be zero and so no payment will be due at the main Generating Unit payment rate, and

ii) For the GT, Gtleadcomp Mvarh export value at the GT payment rate.

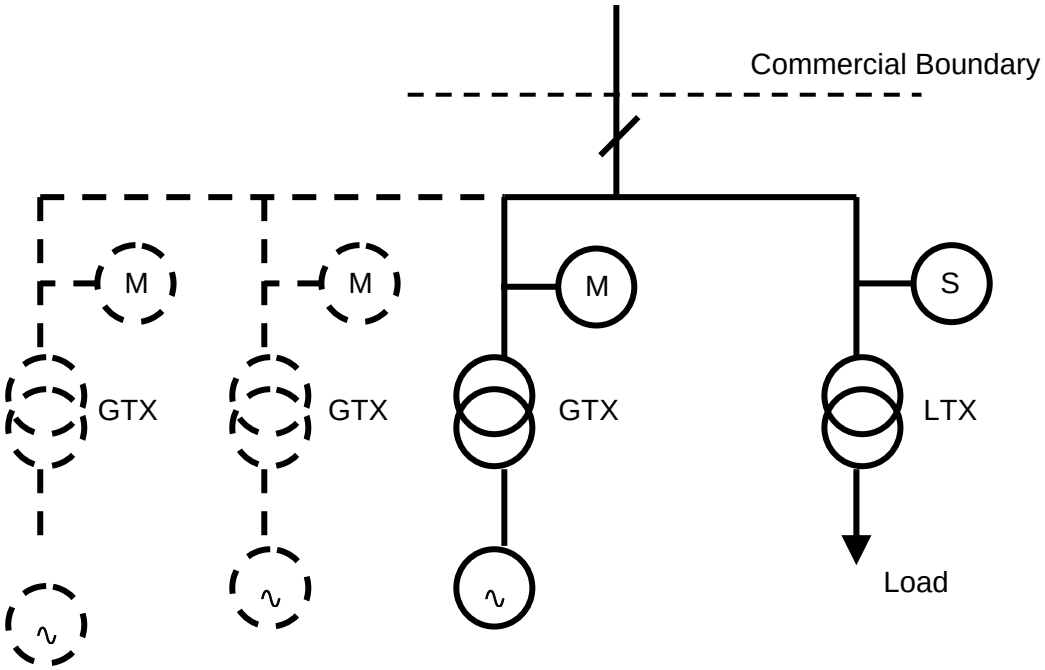
The above four cases apply to instances where there is all leading or all lagging reactive energy during a Settlement Period **and** where both leading and lagging operation occurs in a Settlement Period.

6. CATEGORY D

This category covers the case where the Generating Unit connected at the Commercial Boundary also supplies an embedded load.

In such cases the reactive power produced by the Generating Unit needs to be determined in relation to the reactive nature of the load and whether the Generating Unit has been despatched to provide lagging or leading reactive power. Figure (v) shows one such arrangement and indicates the typical positions of the Reactive Power Meters.

Figure (v)



Methodology

The Metering Codes of Practice One and Two define the following convention to be used for determining the flow of energy:

Flow of Active Energy	Power Factor	Flow of Reactive Energy
Import	LAGGING	Import
Import	LEADING	Export
Import	UNITY	Zero
Export	LAGGING	Export
Export	LEADING	Import
Export	UNITY	Zero

This means that for a Load, the Leading Mvars will be exporting (towards the Commercial Boundary), whereas leading Mvars for a Generating Unit will be importing (away from the Commercial Boundary).

In order to reflect the impact of the embedded load on the reactive power from the Generating Unit at the Commercial Boundary then three aggregation methodologies will need to apply.

Let

Grlag and Grlead = the Mvarh export and import values at the HV side of the Generating Unit step-up transformer (M in figure v).

Ldlag and Ldlead = the Mvarh import and export values at the HV side of the Embedded Load transformer (S in figure v).

Three case scenarios are dealt with below

1. Where both Unit and Load are exporting (Grlag and Ldlead) or when both Unit and Load are importing (Grlead and Ldlag):-

   Payments will be made for the Generating Unit only and will be calculated utilising the Grlag and/or Grlead Mvarh export and import values at the main Generating Unit payment rate.

2. Where Unit is exporting and Load importing (Grlag and Ldlag):-

   Payments will be made for the Generating Unit less the effect of the Embedded Load and will be calculated using (Grlag – Ldlag) values at the main Generating Unit payment rate. Where (Grlag – Ldlag) < 0 then the value at the main Generating Unit will be zero.

PART F – **PROPOSED CHANGES TO THE METHODOLOGY FOR THE AGGREGATION OF REACTIVE POWER METERING**

3. Where Unit is importing and Load exporting (Grlead and Ldlead):-

Payments will be made for the Generating Unit less the effect of the Embedded Load and will be calculated using (Grlead – Ldlead) values at the main Generating Unit payment rate. Where (Grlead – Ldlead) < 0 then the value at the main Generating Unit will be zero.

The above three cases apply to instances where there is all leading or all lagging reactive energy during a Settlement Period **and** where both leading and lagging operation occurs in a Settlement Period.

Where there is more than one Generating Unit (as indicated by the plant drawn by dotted lines in Figure v), then the total Generating Mvars (Grlead and Grlag) will be determined in accordance with Methodology B in this document.