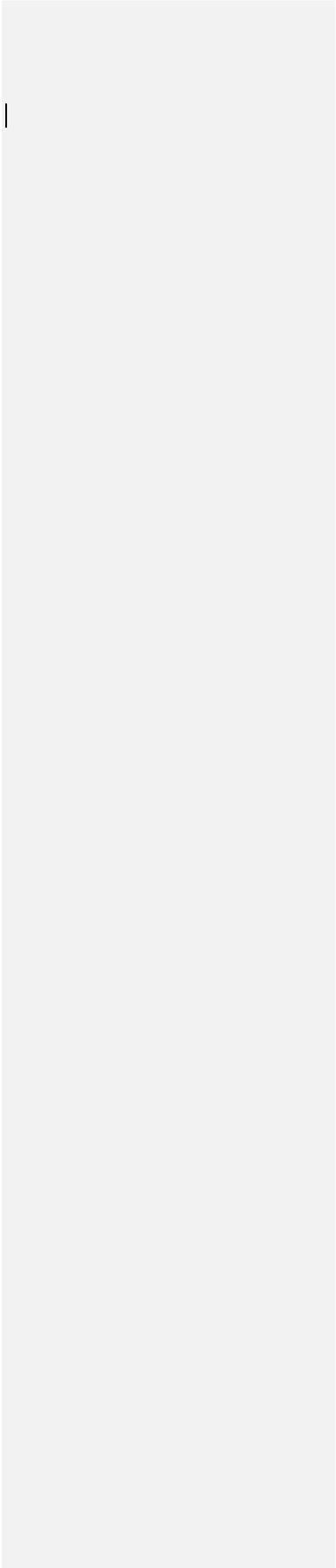


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DRC.1 INTRODUCTION

DRC.1.1 The **Data Registration Code ("DRC")** presents a unified listing of all data required by **NGET** from **Users** and by **Users** from **NGET**, from time to time under the **Grid Code**. The data which is specified in each section of the **Grid Code** is collated here in the **DRC**. Where there is any inconsistency in the data requirements under any particular section of the **Grid Code** and the **Data Registration Code** the provisions of the particular section of the **Grid Code** shall prevail.

DRC.1.2 The **DRC** identifies the section of the **Grid Code** under which each item of data is required.

DRC.1.3 The Code under which any item of data is required specifies procedures and timings for the supply of that data, for routine updating and for recording temporary or permanent changes to that data. All timetables for the provision of data are repeated in the **DRC**.

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DRC.1.4 Various sections of the **Grid Code** also specify information which ~~the~~ **Users** will receive from **NGET**. This information is summarised in a single schedule in the **DRC** (Schedule 9).

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DRC.1.5 The categorisation of data into **DPD I** and **DPD II** is indicated in the **DRC** below.

DRC.2 OBJECTIVE

The objective of the **DRC** is to:

DRC.2.1 List and collate all the data to be provided by each category ~~of User~~ **of User** to **NGET** under the **Grid Code**.

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DRC.2.2 List all the data to be provided by **NGET** to each category ~~of User~~ **of User** under the **Grid Code**.

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DRC.3 SCOPE

DRC.3.1 The **DRC** applies to **NGET** and ~~to Users~~ **to Users**, which in this **DRC** means:-

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- (a) **Generators** (including those undertaking **OTSDUW** and/or those who own and/or operate **DC Connected Power Park Modules**);
- (b) **Network Operators**;
- (c) **DC Converter Station owners** and **HVDC System Owners**;
- (d) **Suppliers**;
- (e) **Non-Embedded Customers** (including, for the avoidance of doubt, a **Pumped Storage Generator** in that capacity);
- (f) **Externally Interconnected System Operators**;
- (g) **Interconnector Users**; and
- (h) **BM Participants**.

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DRC.3.2 For the avoidance of doubt, the **DRC** applies to both **GC Code Users** and **EU Code Users** **User's**.

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DRC.4 DATA CATEGORIES AND STAGES IN REGISTRATION

DRC.4.1.1 Within the **DRC** each data item is allocated to one of the following three categories:

- (a) **Standard Planning Data (SPD)**
- (b) **Detailed Planning Data (DPD)**
- (c) **Operational Data**

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- DRC.4.2 Standard Planning Data (SPD)
- DRC.4.2.1 The **Standard Planning Data** listed and collated in this **DRC** is that data listed in Part 1 of the Appendix to the **PC**.
- DRC.4.2.2 **Standard Planning Data** will be provided to **NGET** in accordance with PC.4.4 and PC.A.1.2.
- DRC.4.3 Detailed Planning Data (DPD)
- DRC.4.3.1 The **Detailed Planning Data** listed and collated in this **DRC** is categorised as **DPD I** and **DPD II** and is that data listed in Part 2 of the Appendix to the **PC**.
- DRC.4.3.2 **Detailed Planning Data** will be provided to **NGET** in accordance with PC.4.4, PC.4.5 and PC.A.1.2.
- DRC.4.4 Operational Data
- DRC.4.4.1 **Operational Data** is data which is required by the **Operating Codes** and the **Balancing Codes**. Within the **DRC**, **Operational Data** is sub-categorised according to the Code under which it is required, namely **OC1**, **OC2**, **BC1** or **BC2**.
- DRC.4.4.2 **Operational Data** is to be supplied in accordance with timetables set down in the relevant **Operating Codes** and **Balancing Codes** and repeated in tabular form in the schedules to the **DRC**.
- DRC.5 PROCEDURES AND RESPONSIBILITIES
- DRC.5.1 Responsibility For Submission And Updating Of Data
- In accordance with the provisions of the various sections of the **Grid Code**, each **User** must submit data as summarised in DRC.6 and listed and collated in the attached schedules.
- DRC.5.2 Methods Of Submitting Data
- DRC.5.2.1 Wherever possible the data schedules to the **DRC** are structured to serve as standard formats for data submission and such format must be used for the written submission of data to **NGET**.
- DRC.5.2.2 Data must be submitted to the **Transmission Control Centre** notified by **NGET** or to such other department or address as **NGET** may from time to time advise. The name of the person at the **User Site** who is submitting each schedule of data must be included.
- DRC.5.2.3 Where a computer data link exists between a ~~User~~**User** and **NGET**, data may be submitted via this link. **NGET** will, in this situation, provide computer files for completion by the **User** containing all the data in the corresponding **DRC** schedule.
- Data submitted can be in an electronic format using a proforma to be supplied by **NGET** or other format to be agreed annually in advance with **NGET**. In all cases the data must be complete and relate to, and relate only to, what is required by the relevant section of the **Grid Code**.
- DRC.5.2.4 Other modes of data transfer, such as magnetic tape, may be utilised if **NGET** gives its prior written consent.
- DRC.5.2.5 **Generators, HVDC System Owners** and **DC Converter Station** owners submitting data for a **Power Generating Module, Generating Unit, DC Converter, HVDC System, Power Park Module (including DC Connected Power Park Modules)** or **CCGT Module** before the issue of a **Final Operational Notification** should submit the **DRC** data schedules and compliance information required under the **CP** electronically using the **User Data File Structure** unless otherwise agreed with **NGET**.

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- DRC.5.3 Changes To Users' Data
- DRC.5.3.1 Whenever ~~a User~~**User**, becomes aware of a change to an item of data which is registered with **NGET** the **User** must notify **NGET** in accordance with each section of the Grid Code. The method and timing of the notification to **NGET** is set out in each section of the Grid Code.
- DRC.5.4 Data Not Supplied
- DRC.5.4.1 **Users** and **NGET** are obliged to supply data as set out in the individual sections of the **Grid Code** and repeated in the **DRC**. If a **User** fails to supply data when required by any section of the **Grid Code**, **NGET** will estimate such data if and when, in the **NGET's** view, it is necessary to do so. If **NGET** fails to supply data when required by any section of the **Grid Code**, ~~the User~~**the User**, to whom that data ought to have been supplied, will estimate such data if and when, in that **User's** view, it is necessary to do so. Such estimates will, in each case, be based upon data supplied previously for the same **Plant** or **Apparatus** or upon corresponding data for similar **Plant** or **Apparatus** or upon such other information as **NGET** or ~~that User~~**that User**, as the case may be, deems appropriate.
- DRC.5.4.2 **NGET** will advise ~~a User~~**User** in writing of any estimated data it intends to use pursuant to DRC.5.4.1 relating directly to that **User's Plant** or **Apparatus** in the event of data not being supplied.
- DRC.5.4.3 ~~A User~~**A User** will advise **NGET** in writing of any estimated data it intends to use pursuant to DRC.5.4.1 in the event of data not being supplied.
- DRC.5.5 Substituted Data
- DRC.5.5.1 In the case of PC.A.4 only, if the data supplied by ~~a User~~**User** does not in **NGET's** reasonable opinion reflect the equivalent data recorded by **NGET**, **NGET** may estimate such data if and when, in the view of **NGET**, it is necessary to do so. Such estimates will, in each case, be based upon data supplied previously for the same **Plant** or **Apparatus** or upon corresponding data for similar **Plant** or **Apparatus** or upon such other information as **NGET** deems appropriate.
- DRC.5.5.2 **NGET** will advise ~~a User~~**User** in writing of any estimated data it intends to use pursuant to DRC.5.5.1 relating directly to that **User's Plant** or **Apparatus** where it does not in **NGET's** reasonable opinion reflect the equivalent data recorded by **NGET**. Such estimated data will be used by **NGET** in place of the appropriate data submitted by the **User** pursuant to PC.A.4 and as such shall be deemed to accurately represent the **User's** submission until such time as the **User** provides data to **NGET's** reasonable satisfaction.
- DRC.6 DATA TO BE REGISTERED
- DRC.6.1 Schedules 1 to 19 attached cover the following data areas.
- DRC.6.1.1 Schedule 1 -- ~~Power Generating Module, Generating Unit (or, CCGT Module), Power Park Module (including including DC Connected Power Park Module and Power Park Unit) And, HVDC System and DC Converter Technical Data.~~
 Comprising **Power Generating Module, Generating Unit (and CCGT Module), Power Park Module (including DC Connected Power Park Module and Power Park Unit) and DC Converter** fixed electrical parameters.
- DRC.6.1.2 Schedule 2 - Generation Planning Parameters
 Comprising the **Genset** parameters required for **Operational Planning** studies.
- DRC.6.1.3 Schedule 3 - Large Power Station Outage Programmes, Output Usable And Inflexibility Information.
 Comprising generation outage planning, **Output Usable** and inflexibility information at timescales down to the daily **BM Unit Data** submission.

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- DRC.6.1.4 Schedule 4 - Large Power Station Droop And Response Data.
Comprising data on governor **Droop** settings and **Primary, Secondary and High Frequency Response** data for **Large Power Stations**.
- DRC.6.1.5 Schedule 5 – User’s System Data.
Comprising electrical parameters relating to **Plant** and **Apparatus** connected to the **National Electricity Transmission System**.
- DRC.6.1.6 Schedule 6 – Users Outage Information.
Comprising the information required by **NGET** for outages on the **UsersUser, System**, including outages at **Power Stations** other than outages of **Gensets**
- DRC.6.1.7 Schedule 7 - Load Characteristics.
Comprising the estimated parameters of load groups in respect of, for example, harmonic content and response to frequency.
- DRC.6.1.8 Schedule 8 - BM Unit Data.
- DRC.6.1.9 Schedule 9 - Data Supplied By NGET To Users.
- DRC.6.1.10 Schedule 10 - Demand Profiles And Active Energy Data
Comprising information relating to the **Network Operators’** and **Non-Embedded Customers’** total **Demand** and **Active Energy** taken from the **National Electricity Transmission System**
- DRC.6.1.11 Schedule 11 - Connection Point Data
Comprising information relating to **Demand**, demand transfer capability and the **Small Power Station, Medium Power Station** and **Customer** generation connected to the **Connection Point**
- DRC.6.1.12 Schedule 12 - Demand Control Data
Comprising information related to **Demand Control**
- DRC.6.1.13 Schedule 13 - Fault Infeed Data
Comprising information relating to the short circuit contribution to the **National Electricity Transmission System** from **Users** other than **Generators, HVDC System Owners, and DC Converter Station** owners.
- DRC.6.1.14 Schedule 14 - Fault Infeed Data (Generators Including Unit And Station Transformers)
Comprising information relating to the Short Circuit contribution to the **National Electricity Transmission System** from **Generators, HVDC System Owners, and DC Converter Station** owners.
- DRC.6.1.15 Schedule 15 – Mothballed Power Generating Module, Mothballed Generating Unit, Mothballed Power Park Module, (including Mothballed DC Connected Power Park Modules), Mothballed HVDC Systems, Mothballed HVDC Converters At A, Mothballed DC Converters at a DC Converter Station And Alternative Fuel Data
Comprising information relating to estimated return to service times for **Mothballed Power Generating Modules, Mothballed Generating Units, Mothballed Power Park Modules (including Mothballed DC Connected Power Park Modules), Mothballed HVDC Systems, Mothballed HVDC Converters, and Mothballed DC Converters at a DC Converter Station** and the capability of gas-fired **Generating Units** to operate using alternative fuels.
- DRC.6.1.16 Schedule 16 – Black Start Information
Comprising information relating to **Black Start**.
- DRC.6.1.17 Schedule 17 – Access Period Schedule

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Comprising **Access Period** information for **Transmission Interface Circuits** within an **Access Group**.

DRC.6.1.18 Schedule 18 – Generators Undertaking OTSDUW Arrangements

Comprising electrical parameters relating to **OTSDUW Plant and Apparatus** between the **Offshore Grid Entry Point** and **Transmission Interface Point**.

DRC.6.1.19 Schedule 19 – User Data File Structure

Comprising information relating to the **User Data File Structure**.

DRC.6.2 The **Schedules** applicable to each class of **User** are as follows:

<u>User</u>	<u>Schedule</u>
Generators with Large Power Stations	1, 2, 3, 4, 9, 14, 15, 16, 19
Generators with Medium Power Stations (see notes 2, 3, 4)	1, 2 (part), 9, 14, 15, 19
Generators with Small Power Stations directly connected to the National Electricity Transmission System	1, 6, 14, 15, 19
Generators undertaking OTSDUW (see note 5)	18, 19
All Users connected directly to the National Electricity Transmission System	5, 6, 9
All Users connected directly to the National Electricity Transmission System other than Generators	10,11,13,17
All Users connected directly to the National Electricity Transmission System with Demand	7, 9
A Pumped Storage Generator, Externally Interconnected System Operator and Interconnector Users	12 (as marked)
All Suppliers	12
All Network Operators	12
All BM Participants	8
All DC Converter Station owners	1, 4, 9, 14, 15, 19

Notes:

- (1) **Network Operators** must provide data relating to **Small Power Stations** and/or **Customer Generating Plant Embedded** in their **Systems** when such data is requested by **NGET** pursuant to PC.A.3.1.4 or PC.A.5.1.4.
- (2) The data in schedules 1, 14 and 15 need not be supplied in relation to **Medium Power Stations** connected at a voltage level below the voltage level of the **Subtransmission System** except in connection with a **CUSC Contract** or unless specifically requested by **NGET**.
- (3) Each **Network Operator** within whose **System** an **Embedded Medium Power Station** not subject to a **Bilateral Agreement** or **Embedded DC Converter Station** not subject to a **Bilateral Agreement** is situated shall provide the data to **NGET** in respect of each such **Embedded Medium Power Station** or **Embedded DC Converter Station** or HVDC System.

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- (4) In the case of Schedule 2, **Generators**, **HVDC System Owners**, **DC Converter Station** owners or **Network Operators** in the case of **Embedded Medium Power Stations** not subject to a **Bilateral Agreement** or **Embedded DC Converter Stations** not subject to a **Bilateral Agreement**, would only be expected to submit data in relation to **Standard Planning Data** as required by the **Planning Code**.
- (5) In the case of **Generators** undertaking **OTSDUW**, the **Generator** will need to supply **User** data in accordance with the requirements of **Large** or **Small Power Stations** (as defined in DRC.6.2) up to the **Offshore Grid Entry Point**. In addition, the **User** will also need to submit **Offshore Transmission System** data in between the **Interface Point** and its **Connection Points** in accordance with the requirements of Schedule 18.

SCHEDULE 1 — POWER GENERATING MODULE, GENERATING UNIT (OR CCGT MODULE), POWER PARK MODULE, DC CONNECTED POWER PARK MODULE, HVDC SYSTEM AND DC CONVERTER TECHNICAL DATA

PAGE 1 OF 19

ABBREVIATIONS:

SPD = Standard Planning Data

% on MVA = % on Rated MVA

% on 100 = % on 100 MVA

DPD = Detailed Planning Data

RC = Registered Capacity

MC = Maximum Capacity

OC1, BC1, etc = Grid Code
for which data is required

CUSC Contract = User data which may be submitted to the **Relevant Transmission Licensees** by **NGET**, following the acceptance by a **User** of a **CUSC Contract**.

CUSC App. Form = User data which may be submitted to the **Relevant Transmission Licensees** by **NGET**, following an application by a **User** for a **CUSC Contract**.

Note:

All parameters, where applicable, are to be measured at nominal **System Frequency**

- + these **SPD** items should only be given in the data supplied with the application for a **CUSC Contract**.
- * Asterisk items are not required for **Small Power Stations** and **Medium Power Stations**
Information is to be given on a **Unit** basis, unless otherwise stated. Where references to **CCGT Modules** are made, the columns "G1" etc should be amended to read "M1" etc, as appropriate
- These data items may be submitted to the **Relevant Transmission Licensees** from **NGET** in respect of the **National Electricity Transmission System**. The data may be submitted to the **Relevant Transmission Licensees** in a summarised form e.g. network model; the data transferred will have been originally derived from data submitted by **Users** to **NGET**.
- these data items may be submitted to the **Relevant Transmission Licensee** from **NGET** in respect to **Relevant Units** only. The data may be submitted to the **Relevant Transmission Licensee** in a summarised form e.g. network model; the data transferred will have been originally derived from data submitted by **Users** to **NGET**.

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SCHEDULE 1 — POWER GENERATING MODULE, GENERATING UNIT (OR CCGT MODULE), POWER PARK MODULE, DC CONNECTED POWER PARK MODULE, HVDC SYSTEM AND DC CONVERTER TECHNICAL DATA
PAGE 2 OF 19

POWER STATION NAME: _____

DATE: _____

DATA DESCRIPTION	UNITS	DATA to		DATA CAT.	GENERATING UNIT OR STATION DATA						
		CUSC Cont ract	CUSC App. Form		F.Yr. 0	F.Yr. 1	F.Yr. 2	F.Yr. 3	F.Yr. 4	F.Yr. 5	F.Yr. 6
<p>GENERATING STATION DEMANDS: Demand associated with the Power Station supplied through the National Electricity Transmission System or the Generator's the Generator's User System (PC.A.5.2)</p> <ul style="list-style-type: none"> - The maximum Demand that could occur. - Demand at specified time of annual peak half hour of National Electricity Transmission System Demand at Annual ACS Conditions. - Demand at specified time of annual minimum half-hour of National Electricity Transmission System Demand. <p>(Additional Demand supplied through the unit transformers to be provided below)</p>	<p>MW MVA_r MW MVA_r</p> <p>MW MVA_r</p>	<p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p><input type="checkbox"/> <input type="checkbox"/></p>	<p>DPD I DPD I DPD II DPD II</p> <p>DPD II DPD II</p>								
<p>INDIVIDUAL GENERATING UNIT (OR AS THE CASE MAY BE, <u>SYNCHRONOUS POWER GENERATING MODULE OR CCGT MODULE</u>) DATA</p> <p>Point of connection to the National Electricity Transmission System (or the Total System if embedded) of the Generating Unit or Synchronous Power Generating Module (other than a CCGT Unit) or the CCGT Module, as the case may be in terms of geographical and electrical location and system voltage (PC.A.3.4.1)</p> <p>If the busbars at the Connection Point are normally run in separate sections identify the section to which the Generating Unit (other than a CCGT Unit) or Synchronous Power Generating Module or CCGT Module, as the case may be is connected (PC.A.3.1.5)</p>	<p>Text</p> <p>Section Number</p>	<p><input type="checkbox"/> <input type="checkbox"/></p>	<p><input checked="" type="checkbox"/> <input checked="" type="checkbox"/></p>	<p>SPD SPD</p>	G1	G2	G3	G4	G5	G6	STN

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Type of Unit (steam, Gas Turbine
Combined Cycle Gas Turbine Unit,
tidal, wind, etc.)
(PC.A.3.2.2 (h))

□

SCHEDULE 1 — POWER GENERATING MODULE, GENERATING UNIT (OR CCGT MODULE), POWER PARK MODULE, DC CONNECTED POWER PARK MODULE, HVDC SYTEM AND DC CONVERTER TECHNICAL DATA

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INDIVIDUAL <u>SYNCHRONOUS POWER GENERATING MODULE</u> GENERATING UNIT (OR AS THE CASE MAY BE, <u>CCGT MODULE</u>) DATA					G1	G2	G3	G4	G5	G6	STN
<p>A list of the <u>Generating Units and CCGT Units</u> within a <u>Synchronous Power Generating Module or CCGT Module</u>, identifying each <u>CCGT Unit</u>, and the <u>Power Generating Module or CCGT Module</u> of which it forms part, unambiguously. In the case of a Range CCGT Module, details of the possible configurations should also be submitted. (P.C.A.3.2.2 (g))</p>	□	■	SPD								

SCHEDULE 1 — POWER GENERATING MODULE, GENERATING UNIT (OR CCGT MODULE), POWER PARK MODULE, DC CONNECTED POWER PARK MODULE, HVDC SYSTEM AND DC CONVERTER TECHNICAL DATA

DATA DESCRIPTION	UNITS	DATA to		DATA CAT.	GENERATING UNIT (OR CCGT MODULE, AS THE CASE MAY BE)							
		RTL			G1	G2	G3	G4	G5	G6	STN	
Rated MVA (PC.A.3.3.1)	MVA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+								
Rated MW (PC.A.3.3.1)	MW	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+								
Rated terminal voltage (PC.A.5.3.2.(a) & PC.A.5.4.2 (b))	kV	<input type="checkbox"/>	<input type="checkbox"/>	DPD I								
*Performance Chart at Onshore Synchronous Generating Unit stator terminals (PC.A.3.2.2(f)(i))				SPD	(see OC2 for specification)							
*Performance Chart of the Offshore Synchronous Generating Unit at the Offshore Grid Entry Point (PC.A.3.2.2(f)(ii))												
*Synchronous Generating Unit Performance Chart (PC.A.3.2.2(f))												
*Power Generating Module Performance Chart of the Synchronous Power Generating Module (PC.A.3.2.2(f))												
*Maximum terminal voltage set point (PC.A.5.3.2.(a) & PC.A.5.4.2 (b))	kV	<input type="checkbox"/>	<input type="checkbox"/>	DPD I								
*Terminal voltage set point step resolution – if not continuous (PC.A.5.3.2.(a) & PC.A.5.4.2 (b))	kV	<input type="checkbox"/>	<input type="checkbox"/>	DPD I								
*Output Usable (on a monthly basis) (PC.A.3.2.2(b))	MW			SPD	(except in relation to CCGT Modules when required on a unit basis under the Grid Code, this data item may be supplied under Schedule 3)							
Turbo-Generator inertia constant (for synchronous machines) (PC.A.5.3.2(a))	MW secs /MVA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+								
Short circuit ratio (synchronous machines) (PC.A.5.3.2(a))		<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+								
Normal auxiliary load supplied by the Generating Unit at rated MW output (PC.A.5.2.1)	MW	<input type="checkbox"/>	<input type="checkbox"/>	DPD II								
Rated field current at rated MW and MVA output and at rated terminal voltage (PC.A.5.3.2 (a))	MVA	<input type="checkbox"/>	<input type="checkbox"/>	DPD II								
Rated field current at rated MW and MVA output and at rated terminal voltage (PC.A.5.3.2 (a))	A	<input type="checkbox"/>	<input type="checkbox"/>	DPD II								
Field current open circuit saturation curve (as derived from appropriate manufacturers' test certificates): (PC.A.5.3.2 (a))												
120% rated terminal volts	A	<input type="checkbox"/>	<input type="checkbox"/>	DPD II								
110% rated terminal volts	A	<input type="checkbox"/>	<input type="checkbox"/>	DPD II								
100% rated terminal volts	A	<input type="checkbox"/>	<input type="checkbox"/>	DPD II								
90% rated terminal volts	A	<input type="checkbox"/>	<input type="checkbox"/>	DPD II								
80% rated terminal volts	A	<input type="checkbox"/>	<input type="checkbox"/>	DPD II								
70% rated terminal volts	A	<input type="checkbox"/>	<input type="checkbox"/>	DPD II								
60% rated terminal volts	A	<input type="checkbox"/>	<input type="checkbox"/>	DPD II								
50% rated terminal volts	A	<input type="checkbox"/>	<input type="checkbox"/>	DPD II								
IMPEDANCES:												
(Unsatrated)												
Direct axis synchronous reactance (PC.A.5.3.2(a))	% on MVA	<input type="checkbox"/>	<input type="checkbox"/>	DPD I								
Direct axis transient reactance (PC.A.3.3.1(a)& PC.A.5.3.2(a))	% on MVA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+								
Direct axis sub-transient reactance (PC.A.5.3.2(a))	% on MVA	<input type="checkbox"/>	<input type="checkbox"/>	DPD I								
Quad axis synch reactance (PC.A.5.3.2(a))	% on MVA	<input type="checkbox"/>	<input type="checkbox"/>	DPD I								
Quad axis sub-transient reactance (PC.A.5.3.2(a))	% on MVA	<input type="checkbox"/>	<input type="checkbox"/>	DPD I								
Stator leakage reactance (PC.A.5.3.2(a))	% on MVA	<input type="checkbox"/>	<input type="checkbox"/>	DPD I								

Armature winding direct current resistance. (PC.A.5.3.2(a))	% on MVA	<input type="checkbox"/>		DPD I																
In Scotland, negative sequence resistance (PC.A.2.5.6 (a) (iv))	% on MVA	<input type="checkbox"/>		DPD I																

Note:- the above data item relating to armature winding direct-current resistance need only be provided by **Generators** in relation to **Generating Units or Synchronous Generating Units within Power Generating Modules** commissioned after 1st March 1996 and in cases where, for whatever reason, the **Generator** is aware of the value of the data item.

SCHEDULE 1 — POWER GENERATING MODULE, GENERATING UNIT (OR CCGT MODULE), POWER PARK MODULE, DC CONNECTED POWER PARK MODULE, HVDC SYSTEM AND DC CONVERTER TECHNICAL DATA

PAGE 5 OF 19

DATA DESCRIPTION	UNITS	DATA to		DATA CAT.	GENERATING UNIT OR STATION DATA						
		CUSC Contract	CUSC App. Form		G1	G2	G3	G4	G5	G6	STN
TIME CONSTANTS (Short-circuit and Unsaturated)											
Direct axis transient time constant (PC.A.5.3.2(a))	S	<input type="checkbox"/>		DPD I							
Direct axis sub-transient time constant (PC.A.5.3.2(a))	S	<input type="checkbox"/>		DPD I							
Quadrature axis sub-transient time constant (PC.A.5.3.2(a))	S	<input type="checkbox"/>		DPD I							
Stator time constant (PC.A.5.3.2(a))	S	<input type="checkbox"/>		DPD I							
MECHANICAL PARAMETERS (PC.A.5.3.2(a))											
The number of turbine generator masses		<input type="checkbox"/>		DPD II							
Diagram showing the Inertia and parameters for each turbine generator mass for the complete drive train	Kgm ²	<input type="checkbox"/>		DPD II							
Diagram showing Stiffness constants and parameters between each turbine generator mass for the complete drive train	Nm/rad	<input type="checkbox"/>		DPD II							
Number of poles		<input type="checkbox"/>		DPD II							
Relative power applied to different parts of the turbine	%	<input type="checkbox"/>		DPD II							
Torsional mode frequencies	Hz	<input type="checkbox"/>		DPD II							
Modal damping decrement factors for the different mechanical modes		<input type="checkbox"/>		DPD II							
GENERATING UNIT STEP-UP TRANSFORMER											
Rated MVA (PC.A.3.3.1 & PC.A.5.3.2)	MVA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+ DPD I							
Voltage Ratio (PC.A.5.3.2)	-	<input type="checkbox"/>		DPD I							
Positive sequence reactance: (PC.A.5.3.2)											
Max tap	% on MVA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+							
Min tap	% on MVA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+							
Nominal tap	% on MVA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+							
Positive sequence resistance: (PC.A.5.3.2)											
Max tap	% on MVA	<input type="checkbox"/>		DPD II							
Min tap	% on MVA	<input type="checkbox"/>		DPD II							
Nominal tap	% on MVA	<input type="checkbox"/>		DPD II							
Zero phase sequence reactance (PC.A.5.3.2)	% on MVA	<input type="checkbox"/>		DPD II							
Tap change range (PC.A.5.3.2)	+% / -%	<input type="checkbox"/>		DPD II							
Tap change step size (PC.A.5.3.2)	%	<input type="checkbox"/>		DPD II							
Tap changer type: on-load or off-circuit (PC.A.5.3.2)	On/Off	<input type="checkbox"/>		DPD II							

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SCHEDULE 1 — POWER GENERATING MODULE, GENERATING UNIT (OR CCGT MODULE), POWER PARK MODULE, DC CONNECTED POWER PARK MODULE, HVDC SYSTEM AND DC CONVERTER TECHNICAL DATA

DATA DESCRIPTION	UNITS	DATA to		DATA CAT.	GENERATING UNIT OR STATION DATA						
		RTL	Form		G1	G2	G3	G4	G5	G6	STN
<u>EXCITATION:</u>											
<u>Note:</u> The data items requested under Option 1 below may continue to be provided by Generators in relation to Generating Units on the System at 9 January 1995 (in this paragraph, the "relevant date") or they may provide the new data items set out under Option 2. Generators must supply the data as set out under Option 2 (and not those under Option 1) for Generating Unit and Synchronous Power Generating Unit excitation control systems commissioned after the relevant date, those Generating Unit or Synchronous Power Generating Unit excitation control systems recommissioned for any reason such as refurbishment after the relevant date and Generating Unit or Synchronous Power Generating Unit excitation control systems where, as a result of testing or other process, the Generator is aware of the data items listed under Option 2 in relation to that Generating Unit- or Synchronous Power Generating Unit .											
Option 1											
DC gain of Excitation Loop (PC.A.5.3.2(c))			<input type="checkbox"/>	DPD II							
Max field voltage (PC.A.5.3.2(c))	V		<input type="checkbox"/>	DPD II							
Min field voltage (PC.A.5.3.2(c))	V		<input type="checkbox"/>	DPD II							
Rated field voltage (PC.A.5.3.2(c))	V		<input type="checkbox"/>	DPD II							
Max rate of change of field volts: (PC.A.5.3.2(c))											
Rising	V/Sec		<input type="checkbox"/>	DPD II							
Falling	V/Sec		<input type="checkbox"/>	DPD II							
Details of Excitation Loop (PC.A.5.3.2(c)) Described in block diagram form showing transfer functions of individual elements	Diagram		<input type="checkbox"/>	DPD II	(please attach)						
Dynamic characteristics of over- excitation limiter (PC.A.5.3.2(c))			<input type="checkbox"/>	DPD II							
Dynamic characteristics of under-excitation limiter (PC.A.5.3.2(c))			<input type="checkbox"/>	DPD II							
Option 2											
Exciter category, e.g. Rotating Exciter , or Static Exciter etc (PC.A.5.3.2(c))	Text		<input type="checkbox"/>	SPD							
Excitation System Nominal Response (PC.A.5.3.2(c))	Sec ⁻¹		<input type="checkbox"/>	DPD II							
V_E											
Rated Field Voltage (PC.A.5.3.2(c)) U_{IN}	V		<input type="checkbox"/>	DPD II							
No-load Field Voltage (PC.A.5.3.2(c)) U_{IO}	V		<input type="checkbox"/>	DPD II							
Excitation System On-Load (PC.A.5.3.2(c))			<input type="checkbox"/>								
Positive Ceiling Voltage U_{pL+}	V		<input type="checkbox"/>	DPD II							
Excitation System No-Load (PC.A.5.3.2(c))			<input type="checkbox"/>								
Positive Ceiling Voltage U_{pO+}	V		<input type="checkbox"/>	DPD II							
Excitation System No-Load (PC.A.5.3.2(c))			<input type="checkbox"/>								
Negative Ceiling Voltage U_{pO-}	V		<input type="checkbox"/>	DPD II							
Power System Stabiliser (PSS) fitted (PC.A.3.4.2)	Yes/No		<input type="checkbox"/>	SPD							
<u>Stator Current Limit</u> (PC.A.5.3.2(c))	A		<input type="checkbox"/>	DPD II							
Details of Excitation System (PC.A.5.3.2(c)) (including PSS if fitted) described in block diagram form showing transfer functions of individual elements.	Diagram		<input type="checkbox"/>	DPD II							
Details of Over-excitation Limiter (PC.A.5.3.2(c)) described in block diagram form showing transfer functions of individual elements.	Diagram		<input type="checkbox"/>	DPD II							

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Details of Under-excitation Limiter

(PC.A.5.3.2(c))

described in block diagram form showing transfer functions of individual elements.

Diagram

□

DPD II

SCHEDULE 1 – POWER GENERATING MODULE, GENERATING UNIT (OR CCGT MODULE), POWER PARK MODULE, DC CONNECTED POWER PARK MODULE, HVDC SYSTEM AND DC CONVERTER TECHNICAL DATA

DATA DESCRIPTION	UNITS	DATA to		DATA CAT.	GENERATING UNIT OR STATION DATA						
		CUSC Contract	CUSC App. Form		G1	G2	G3	G4	G5	G6	STN
GOVERNOR AND ASSOCIATED PRIME MOVER PARAMETERS											
<p>Note: The data items requested under Option 1 below may continue to be provided by Generators in relation to Generating Units on the System at 9 January 1995 (in this paragraph, the "relevant date") or they may provide the new data items set out under Option 2. Generators must supply the data as set out under Option 2 (and not those under Option 1) for Generating Unit and Synchronous Power Generating Unit governor control systems commissioned after the relevant date, those Generating Unit and Synchronous Power Generating Unit governor control systems recommissioned for any reason such as refurbishment after the relevant date and Generating Unit and Synchronous Power Generating Unit governor control systems where, as a result of testing or other process, the Generator is aware of the data items listed under Option 2 in relation to that Generating Unit and Synchronous Power Generating Unit.</p>											
Option 1											
GOVERNOR PARAMETERS (REHEAT UNITS) (PC.A.5.3.2(d) – Option 1(i))											
HP Governor average gain	MW/Hz	<input type="checkbox"/>		DPD II							
Speeder motor setting range	Hz	<input type="checkbox"/>		DPD II							
HP governor valve time constant	S	<input type="checkbox"/>		DPD II							
HP governor valve opening limits		<input type="checkbox"/>		DPD II							
HP governor valve rate limits		<input type="checkbox"/>		DPD II							
Re-heat time constant (stored Active Energy in reheater)	S	<input type="checkbox"/>		DPD II							
IP governor average gain	MW/Hz	<input type="checkbox"/>		DPD II							
IP governor setting range	Hz	<input type="checkbox"/>		DPD II							
IP governor time constant	S	<input type="checkbox"/>		DPD II							
IP governor valve opening limits		<input type="checkbox"/>		DPD II							
IP governor valve rate limits		<input type="checkbox"/>		DPD II							
Details of acceleration sensitive elements HP & IP in governor loop		<input type="checkbox"/>		DPD II	(please attach)						
Governor block diagram showing transfer functions of individual elements		<input type="checkbox"/>		DPD II	(please attach)						
GOVERNOR (Non-reheat steam and Gas Turbines) (PC.A.5.3.2(d) – Option 1(ii))											
Governor average gain	MW/Hz	<input type="checkbox"/>		DPD II							
Speeder motor setting range		<input type="checkbox"/>		DPD II							
Time constant of steam or fuel governor valve	S	<input type="checkbox"/>		DPD II							
Governor valve opening limits		<input type="checkbox"/>		DPD II							
Governor valve rate limits		<input type="checkbox"/>		DPD II							
Time constant of turbine	S	<input type="checkbox"/>		DPD II							
Governor block diagram		<input type="checkbox"/>		DPD II	(please attach)						

SCHEDULE 1 – POWER GENERATING MODULE, GENERATING UNIT (OR CCGT MODULE), POWER PARK MODULE, DC CONNECTED POWER PARK MODULE, HVDC SYSTEM AND DC CONVERTER TECHNICAL DATA

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DATA DESCRIPTION	UNITS	DATA to		DATA CAT.	GENERATING UNIT OR STATION DATA						
		CUSC Contract	CUSC App. Form		G1	G2	G3	G4	G5	G6	STN
<i>(PC.A.5.3.2(d) – Option 1(iii))</i>											
BOILER & STEAM TURBINE DATA*											
Boiler time constant (Stored Active Energy)	S			DPD II							
HP turbine response ratio: (Proportion of Primary Response arising from HP turbine)	%			DPD II							
HP turbine response ratio: (Proportion of High Frequency Response arising from HP turbine)	%			DPD II							
End of Option 1											
Option 2											
<u>All Generating Units and Synchronous Power Generating Units</u>											
Governor Block Diagram showing transfer function of individual elements including acceleration sensitive elements		<input type="checkbox"/>		DPD II							
Governor Time Constant <i>(PC.A.5.3.2(d) – Option 2(i))</i>	Sec	<input type="checkbox"/>		DPD II							
#Governor Deadband <i>(PC.A.5.3.2(d) – Option 2(i))</i>											
- Maximum Setting	±Hz			DPD II							
- Normal Setting	±Hz			DPD II							
- Minimum Setting	±Hz			DPD II							
Speeder Motor Setting Range <i>(PC.A.5.3.2(d) – Option 2(i))</i>	%	<input type="checkbox"/>		DPD II							
Average Gain <i>(PC.A.5.3.2(d) – Option 2(i))</i>	MW/Hz	<input type="checkbox"/>		DPD II							
Steam Units											
<i>(PC.A.5.3.2(d) – Option 2(ii))</i>											
HP Valve Time Constant	sec	<input type="checkbox"/>		DPD II							
HP Valve Opening Limits	%	<input type="checkbox"/>		DPD II							
HP Valve Opening Rate Limits	%/sec	<input type="checkbox"/>		DPD II							
HP Valve Closing Rate Limits	%/sec	<input type="checkbox"/>		DPD II							
HP Turbine Time Constant	sec	<input type="checkbox"/>		DPD II							
<i>(PC.A.5.3.2(d) – Option 2(ii))</i>											
IP Valve Time Constant	sec	<input type="checkbox"/>		DPD II							
IP Valve Opening Limits	%	<input type="checkbox"/>		DPD II							
IP Valve Opening Rate Limits	%/sec	<input type="checkbox"/>		DPD II							
IP Valve Closing Rate Limits	%/sec	<input type="checkbox"/>		DPD II							
IP Turbine Time Constant	sec	<input type="checkbox"/>		DPD II							
<i>(PC.A.5.3.2(d) – Option 2(ii))</i>											
LP Valve Time Constant	sec	<input type="checkbox"/>		DPD II							
LP Valve Opening Limits	%	<input type="checkbox"/>		DPD II							
LP Valve Opening Rate Limits	%/sec	<input type="checkbox"/>		DPD II							
LP Valve Closing Rate Limits	%/sec	<input type="checkbox"/>		DPD II							
LP Turbine Time Constant	sec	<input type="checkbox"/>		DPD II							
<i>(PC.A.5.3.2(d) – Option 2(ii))</i>											
Reheater Time Constant	sec			DPD II							
Boiler Time Constant	sec			DPD II							
HP Power Fraction	%			DPD II							
IP Power Fraction	%			DPD II							

Where the generating unit or synchronous power generating unit governor does not have a selectable deadband facility, then the actual value of the deadband need only be provided.

SCHEDULE 1 — POWER GENERATING MODULE, GENERATING UNIT (OR CCGT MODULE), POWER PARK MODULE, DC CONNECTED POWER PARK MODULE, HVDC SYSTEM AND DC CONVERTER TECHNICAL DATA

DATA DESCRIPTION	UNITS	DATA to		DATA CAT.	GENERATING UNIT OR STATION DATA						
		CUSC Contract	CUSC App. Form		G1	G2	G3	G4	G5	G6	STN
Gas Turbine Units											
<i>(PC.A.5.3.2(d) – Option 2(iii))</i>											
Inlet Guide Vane Time Constant	sec		<input type="checkbox"/>	DPD II							
Inlet Guide Vane Opening Limits	%		<input type="checkbox"/>	DPD II							
Inlet Guide Vane Opening Rate Limits	%/sec		<input type="checkbox"/>	DPD II							
Inlet Guide Vane Closing Rate Limits	%/sec		<input type="checkbox"/>	DPD II							
<i>(PC.A.5.3.2(d) – Option 2(iii))</i>											
Fuel Valve Time Constant	sec		<input type="checkbox"/>	DPD II							
Fuel Valve Opening Limits	%		<input type="checkbox"/>	DPD II							
Fuel Valve Opening Rate Limits	%/sec		<input type="checkbox"/>	DPD II							
Fuel Valve Closing Rate Limits	%/sec		<input type="checkbox"/>	DPD II							
<i>(PC.A.5.3.2(d) – Option 2(iii))</i>											
Waste Heat Recovery Boiler Time Constant											
Hydro Generating Units											
<i>(PC.A.5.3.2(d) – Option 2(iv))</i>											
Guide Vane Actuator Time Constant	sec		<input type="checkbox"/>	DPD II							
Guide Vane Opening Limits	%		<input type="checkbox"/>	DPD II							
Guide Vane Opening Rate Limits	%/sec		<input type="checkbox"/>	DPD II							
Guide Vane Closing Rate Limits	%/sec		<input type="checkbox"/>	DPD II							
Water Time Constant	sec		<input type="checkbox"/>	DPD II							
End of Option 2											
UNIT CONTROL OPTIONS*											
<i>(PC.A.5.3.2(e))</i>											
Maximum droop	%			DPD II							
Normal droop	%		<input type="checkbox"/>	DPD II							
Minimum droop	%			DPD II							
Maximum frequency deadband	±Hz			DPD II							
Normal frequency deadband	±Hz			DPD II							
Minimum frequency deadband	±Hz			DPD II							
<u>Maximum frequency Insensitivity1Normal frequency Insensitivity1</u>	±Hz			<u>DPDII</u>							
<u>frequency Insensitivity1</u>	±Hz			<u>DPDII</u>							
<u>Minimum frequency Insensitivity1</u>	±Hz			<u>DPDII</u>							
Maximum Output deadband	±MW			DPD II							
Normal Output deadband	±MW			DPD II							
Minimum Output deadband	±MW			DPD II							
<u>Maximum Output Insensitivity1</u>	±Hz			<u>DPDII</u>							
<u>Normal Output Insensitivity1</u>	±Hz			<u>DPDII</u>							
<u>Minimum Output Insensitivity1</u>	±Hz			<u>DPDII</u>							
Frequency settings between which Unit Load Controller droop applies:											
Maximum	Hz			DPD II							
Normal	Hz			DPD II							
Minimum	Hz			DPD II							
Sustained response normally selected	Yes/No			DPD II							
<u>1 Data required only in respect of Power</u>											

Generating Modules

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SCHEDULE 1 — POWER GENERATING MODULE, GENERATING UNIT (OR CCGT MODULE), POWER PARK MODULE, DC CONNECTED POWER PARK MODULE, HVDC SYSTEM AND DC CONVERTER TECHNICAL DATA

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DATA DESCRIPTION	UNITS	DATA to RTL CUSC Contract <input type="checkbox"/> CUSC App. Form <input type="checkbox"/>	DATA CAT.	POWER PARK UNIT (OR POWER PARK MODULE, AS THE CASE MAY BE)						
				G1	G2	G3	G4	G5	G6	STN
Power Park Module Rated MVA <i>(PC.A.3.3.1(a))</i>	MVA	<input type="checkbox"/>	■ SPD+							
Power Park Module Rated MW <i>(PC.A.3.3.1(a))</i>	MW	<input type="checkbox"/>	■ SPD+							
*Performance Chart of a Power Park Module at the connection point <i>(PC.A.3.2.2(f)(ii))</i>			SPD	(see OC2 for specification)						
*Output Usable (on a monthly basis) <i>(PC.A.3.2.2(b))</i>	MW		SPD	(except in relation to CCGT Modules when required on a unit basis under the Grid Code , this data item may be supplied under Schedule 3)						
Number & Type of Power Park Units within each Power Park Module <i>(PC.A.3.2.2(k))</i> Number & Type of Offshore Power Park Units within each Offshore Power Park String and the number of Offshore Power Park Strings and connection point within each Offshore Power Park Module <i>(PC.A.3.2.2.(k))</i>		<input type="checkbox"/>	SPD							
In the case where an appropriate Manufacturer's Data & Performance Report is registered with NETG then subject to NETG's agreement, the report reference may be given as an alternative to completion of the following sections of this Schedule 1 to the end of page 11 with the exception of the sections marked thus # below.	Reference the Manufacturer's Data & Performance Report		SPD							
Power Park Unit Model - A validated mathematical model in accordance with PC.5.4.2 (a)	Transfer function block diagram and algebraic equations, simulation and measured test results	<input type="checkbox"/>	DPD II							

SCHEDULE 1 — POWER GENERATING MODULE, GENERATING UNIT (OR CCGT MODULE), POWER PARK MODULE DC CONNECTED POWER PARK MODULE, HVDC SYSTEM AND DC CONVERTER TECHNICAL DATA

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DATA DESCRIPTION	UNITS	DATA to		DATA CAT.	POWER PARK UNIT (OR POWER PARK MODULE, AS THE CASE MAY BE)							
		RTL	CUSC App-Form		G1	G2	G3	G4	G5	G6	STN	
Power Park Unit Data (where applicable)												
Rated MVA (PC.A.3.3.1(e))	MVA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+								
Rated MW (PC.A.3.3.1(e))	MW	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+								
Rated terminal voltage (PC.A.3.3.1(e))	V	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+								
Site minimum air density (PC.A.5.4.2(b))	kg/m ³	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DPD								
Site maximum air density	kg/m ³	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DPD								
Site average air density	kg/m ³	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DPD								
Year for which air density data is submitted		<input type="checkbox"/>	<input checked="" type="checkbox"/>	DPD								
Number of pole pairs		<input type="checkbox"/>	<input checked="" type="checkbox"/>	DPD								
Blade swept area	m ²	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DPD								
Gear Box Ratio		<input type="checkbox"/>	<input checked="" type="checkbox"/>	DPD								
Stator Resistance (PC.A.5.4.2(b))	% on MVA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+								
Stator Reactance (PC.A.3.3.1(e))	% on MVA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+								
Magnetising Reactance (PC.A.3.3.1(e))	% on MVA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+								
Rotor Resistance (at starting). (PC.A.5.4.2(b))	% on MVA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DPD								
Rotor Resistance (at rated running) (PC.A.3.3.1(e))	% on MVA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+								
Rotor Reactance (at starting). (PC.A.5.4.2(b))	% on MVA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	DPD								
Rotor Reactance (at rated running) (PC.A.3.3.1(e))	% on MVA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD								
Equivalent inertia constant of the first mass (e.g. wind turbine rotor and blades) at minimum speed (PC.A.5.4.2(b))	MW secs /MVA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+								
Equivalent inertia constant of the first mass (e.g. wind turbine rotor and blades) at synchronous speed (PC.A.5.4.2(b))	MW secs /MVA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+								
Equivalent inertia constant of the first mass (e.g. wind turbine rotor and blades) at rated speed (PC.A.5.4.2(b))	MW secs /MVA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+								
Equivalent inertia constant of the second mass (e.g. generator rotor) at minimum speed (PC.A.5.4.2(b))	MW secs /MVA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+								
Equivalent inertia constant of the second mass (e.g. generator rotor) at synchronous speed (PC.A.5.4.2(b))	MW secs /MVA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+								
Equivalent inertia constant of the second mass (e.g. generator rotor) at rated speed (PC.A.5.4.2(b))	MW secs /MVA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+								
Equivalent shaft stiffness between the two masses (PC.A.5.4.2(b))	Nm / electrical radian	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+								

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SCHEDULE 1 -- POWER GENERATING MODULE, GENERATING UNIT (OR CCGT MODULE), POWER PARK MODULE, DC CONNECTED POWER PARK MODULE, HVDC SYSTEM AND DC CONVERTER TECHNICAL DATA

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DATA DESCRIPTION	UNITS	DATA to RTL		DATA CAT.	POWER PARK UNIT (OR POWER PARK MODULE, AS THE CASE MAY BE)						
		CUSC Contract	CUSC App. Form		G1	G2	G3	G4	G5	G6	STN
Minimum generator rotor speed (Doubly Fed Induction Generators) (PC.A.3.3.1(e))	RPM	□	■	SPD+							
Maximum generator rotor speed (Doubly Fed Induction Generators) (PC.A.3.3.1(e))	RPM	□	■	SPD+							
The optimum generator rotor speed versus wind speed (PC.A.5.4.2(b))	tabular format	□		DPD II							
Power Converter Rating (Doubly Fed Induction Generators) (PC.A.5.4.2(b))	MVA	□	■	DPD II							
The rotor power coefficient (C _p) versus tip speed ratio (λ) curves for a range of blade angles (where applicable) (PC.A.5.4.2(b))	Diagram + tabular format	□		DPD II							
# The electrical power output versus generator rotor speed for a range of wind speeds over the entire operating range of the Power Park Unit . (PC.A.5.4.2(b))	Diagram + tabular format	□		DPD II							
The blade angle versus wind speed curve (PC.A.5.4.2(b))	Diagram + tabular format	□		DPD II							
The electrical power output versus wind speed over the entire operating range of the Power Park Unit . (PC.A.5.4.2(b))	Diagram + tabular format	□		DPD II							
Transfer function block diagram, parameters and description of the operation of the power electronic converter including fault ride through capability (where applicable). (PC.A.5.4.2(b))	Diagram	□		DPD II							
For a Power Park Unit consisting of a synchronous machine in combination with a back to back DC Converter or HVDC Converter , or for a Power Park Unit not driven by a wind turbine, the data to be supplied shall be agreed with NGET in accordance with PC.A.7. (PC.A.5.4.2(b))		□									

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SCHEDULE 1 – POWER GENERATING MODULE, GENERATING UNIT (OR CCGT MODULE), POWER PARK MODULE, DC CONNECTED POWER PARK MODULE, HVDC SYSTEM AND DC CONVERTER TECHNICAL DATA

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DATA DESCRIPTION	UNITS	DATA to RTL		DATA CAT.	POWER PARK UNIT (OR POWER PARK MODULE, AS THE CASE MAY BE)						
		CUSC Contract	CUSC App. Form		G1	G2	G3	G4	G5	G6	STN
<p>Torque / Speed and blade angle control systems and parameters (PC.A.5.4.2(c))</p> <p>For the Power Park Unit, details of the torque / speed controller and blade angle controller in the case of a wind turbine and power limitation functions (where applicable) described in block diagram form showing transfer functions and parameters of individual elements</p>	Diagram	<input type="checkbox"/>		DPD II							
<p># Voltage/Reactive Power/Power Factor control system parameters (PC.A.5.4.2(d))</p> <p># For the Power Park Unit and Power Park Module details of Voltage/Reactive Power/Power Factor controller (and PSS if fitted) described in block diagram form including parameters showing transfer functions of individual elements.</p>	Diagram	<input type="checkbox"/>		DPD II							
<p># Frequency control system parameters (PC.A.5.4.2(e))</p> <p># For the Power Park Unit and Power Park Module details of the Frequency controller described in block diagram form showing transfer functions and parameters of individual elements.</p>	Diagram	<input type="checkbox"/>		DPD II							
<p>As an alternative to PC.A.5.4.2 (a), (b), (c), (d), (e) and (f), is the submission of a single complete model that consists of the full information required under PC.A.5.4.2 (a), (b), (c), (d) (e) and (f) provided that all the information required under PC.A.5.4.2 (a), (b), (c), (d), (e) and (f) individually is clearly identifiable. (PC.A.5.4.2(g))</p>	Diagram	<input type="checkbox"/>		DPD II							
<p># Harmonic Assessment Information (PC.A.5.4.2(h)) (as defined in IEC 61400-21 (2001)) for each Power Park Unit:-</p>											
# Flicker coefficient for continuous operation		<input type="checkbox"/>		DPD I							
# Flicker step factor		<input type="checkbox"/>		DPD I							
# Number of switching operations in a 10 minute window		<input type="checkbox"/>		DPD I							
# Number of switching operations in a 2 hour window		<input type="checkbox"/>		DPD I							
# Voltage change factor		<input type="checkbox"/>		DPD I							
# Current Injection at each harmonic for each Power Park Unit and for each Power Park Module	Tabular format	<input type="checkbox"/>		DPD I							
<p>Note:- Generators who own or operate DC Connected Power Park Modules shall supply all data for their DC Connected Power Park Modules as applicable to Power Park Modules.</p>											

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SCHEDULE 1 — POWER GENERATING MODULE, GENERATING UNIT (OR CCGT MODULE), POWER PARK MODULE, DC CONNECTED POWER PARK MODULE, HVDC SYSTEM AND DC CONVERTER TECHNICAL DATA

HVDC SYSTEM AND DC CONVERTER STATION TECHNICAL DATA

HVDC SYSTEM OR DC CONVERTER STATION NAME _____
 DATE: _____

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Data Description	Units	DATA to		Data Category	DC Converter Station Data
		RTL			
(PC.A.4)		CUSC Contract	CUSC App. Form		
<u>HVDC SYSTEM AND DC CONVERTER STATION DEMANDS:</u>					
Demand supplied through Station Transformers associated with the DC Converter Station and HVDC System [PC.A.4.1]	MW MVA _r	<input type="checkbox"/>	<input type="checkbox"/>	DPD II DPD II	
- Demand with all DC Converters and HVDC Converters within and HVDC System operating at Rated MW import.	MW MVA _r	<input type="checkbox"/>	<input type="checkbox"/>	DPD II DPD II	
- Demand with all DC Converters and HVDC Converters within an HVDC System operating at Rated MW export.					
Additional Demand associated with the DC Converter Station or HVDC System supplied through the National Electricity Transmission System. [PC.A.4.1]	MW MVA _r	<input type="checkbox"/>	<input type="checkbox"/>	DPD II DPD II	
- The maximum Demand that could occur.	MW MVA _r	<input type="checkbox"/>	<input type="checkbox"/>	DPD II DPD II	
- Demand at specified time of annual peak half hour of NGET Demand at Annual ACS Conditions .	MW MVA _r	<input type="checkbox"/>	<input type="checkbox"/>	DPD II DPD II	
- Demand at specified time of annual minimum half-hour of NGET Demand .	Text	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+	
DC CONVERTER STATION AND HVDC SYSTEM DATA	Text	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+	
Number of poles, i.e. number of DC Converters or HVDC Converters within the HVDC System		<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+	
Pole arrangement (e.g. monopole or bipole)		<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Details of each viable operating configuration		<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Configuration 1 Configuration 2 Configuration 3	Diagram Diagram Diagram	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD	

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Configuration 4	Diagram				
Configuration 5	Diagram				
Configuration 6					
Remote ac connection arrangement	Diagram				

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**SCHEDULE 1 — POWER PARK MODULE, GENERATING UNIT (OR CCGT MODULE),
POWER PARK MODULE, DC CONNECTED POWER PARK MODULE, HVDC SYSTEM
AND DC CONVERTER TECHNICAL DATA**

Data Description	Units	DATA to RTL		Data Category	Operating Configuration						
		CUSC Contract	CUSC App. Form		1	2	3	4	5	6	
DC CONVERTER STATION AND HVDC SYSTEM DATA (PC.A.3.3.1d)											
DCDC Converter or HVDC Converter Type (e.g. current or Voltage source)	Text	☐	■	SPD							
	Text	☐	■	SPD							
Point of connection to the NET Transmission System (or the Total System if Embedded) of the DC Converter Station or HVDC System configuration in terms of geographical and electrical location and system voltage	Section Number	☐	■	SPD							
If the busbars at the Connection Point are normally run in separate sections identify the section to which the DC Converter Station or HVDC System configuration is connected		☐	■								
Rated MW import per pole [PC.A.3.3.1]	MW	☐	■	SPD ₊							
Rated MW export per pole [PC.A.3.3.1]	MW	☐	■	SPD ₊							
		☐	■								
		☐	■								

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Data Description	Units	DATA to RTL		Data Category	Operating Configuration						
		CUSC Contract	CUSC App. Form		1	2	3	4	5	6	
ACTIVE POWER TRANSFER CAPABILITY (PC.A.3.2.2)											
Registered Capacity	MW	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD							
Registered Import Capacity	MW	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD							
Minimum Generation	MW	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD							
Minimum Import Capacity	MW	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD							
<u>Maximum HVDC Active Power Transmission Capacity</u>	MW	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD							
<u>Minimum Active Power Transmission Capacity</u>	MW	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD							
Import MW available in excess of Registered Import Capacity and Maximum Active Power Transmission Capacity	MW	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD							
Time duration for which MW in excess of Registered Import Capacity is available	Min	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD							
Export MW available in excess of Registered Capacity and Maximum Active Power Transmission Capacity	MW	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD							
Time duration for which MW in excess of Registered Capacity is available	Min	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD							

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SCHEDULE 1 --POWER GENERATING MODULE, GENERATING UNIT (OR CCGT MODULE), POWER PARK MODULE, DC CONNECTED POWER PARK MODULE, HVDC SYSTEM AND DC CONVERTER TECHNICAL DATA

Data Description	Units	DATA to RTL		Data Category	Operating Configuration						
		CUSC Contract	CUSC App. Form		1	2	3	4	5	6	
DCDC CONVERTER AND HVDC CONVERTER TRANSFORMER [PC.A.5.4.3.1				DPD II							
Rated MVA	MVA	<input type="checkbox"/>		DPD II							
Winding arrangement	kV	<input type="checkbox"/>		DPD II							
Nominal primary voltage	kV	<input type="checkbox"/>		DPD II							
Nominal secondary (converter-side) voltage(s)		<input type="checkbox"/>		DPD II							
Positive sequence reactance	% on	<input type="checkbox"/>		DPD II							
Maximum tap	MVA	<input type="checkbox"/>		DPD II							
Nominal tap	% on										
Minimum tap	MVA										
Positive sequence resistance	% on	<input type="checkbox"/>		DPD II							
Maximum tap	MVA	<input type="checkbox"/>		DPD II							
Nominal tap	% on	<input type="checkbox"/>		DPD II							
Minimum tap	MVA	<input type="checkbox"/>		DPD II							
Zero phase sequence reactance	% on	<input type="checkbox"/>		DPD II							
Tap change range	MVA	<input type="checkbox"/>		DPD II							
Number of steps	MVA										
	% on										
	MVA										
	% on										
	MVA										
	+% / -%										

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SCHEDULE 1 — POWER GENERATING MODULE, GENERATING UNIT (OR CCGT MODULE), DC CONNECTED POWER PARK MODULE, HVDC SYSTEM, POWER PARK MODULE AND DC CONVERTER TECHNICAL DATA

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Data Description	Units	DATA to RTL		Data Category	Operating configuration					
		CUSC Contract	CUSC App. Form		1	2	3	4	5	6
<p>DC NETWORK [PC.A.5.4.3.1 (c)]</p> <p>Rated DC voltage per pole Rated DC current per pole</p> <p>Details of the DC Network described in diagram form including resistance, inductance and capacitance of all DC cables and/or DC lines. Details of any line reactors (including line reactor resistance), line capacitors, DC filters, earthing electrodes and other conductors that form part of the DC Network should be shown.</p>	<p>kV A</p> <p>Diagram</p>	<p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>		<p>DPD II DPD II DPD II</p>						
<p>DC CONVERTER STATION AND HVDC SYSTEM AC HARMONIC FILTER AND REACTIVE COMPENSATION EQUIPMENT [PC.A.5.4.3.1 (d)]</p> <p>For all switched reactive compensation equipment</p> <p>Total number of AC filter banks Diagram of filter connections Type of equipment (e.g. fixed or variable) Capacitive rating; or Inductive rating; or Operating range</p> <p>Reactive Power capability as a function of various MW transfer levels</p>	<p>Diagram</p> <p>Text Diagram Text MVar MVar MVar</p> <p>Table</p>	<p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>	<p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p>	<p>DPD II DPD II DPD II DPD II DPD II DPD II</p>						

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SCHEDULE 1 — POWER GENERATING MODULE, GENERATING UNIT (OR CCGT MODULE), POWER PARK MODULE, DC CONNECTED POWER PARK MODULE, HVDC SYSTEM AND DC CONVERTER TECHNICAL DATA

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Data Description	Units	DATA to RTL		Data Category	Operating configuration						
		CUSC Contract	CUSC App. Form		1	2	3	4	5	6	

Data Description	Units	DATA to RTL		Data Category	Operating configuration					
		CUSC Contract	CUSC App. Form		1	2	3	4	5	6
CONTROL SYSTEMS [PC.A.5.4.3.2]										
Static $V_{DC} - P_{DC}$ (DC voltage – DC power) or Static $V_{DC} - I_{DC}$ (DC voltage – DC current) characteristic (as appropriate) when operating as –Rectifier –Inverter	Diagram	☐		DPD II DPD II						
Details of rectifier mode control system, in block diagram form together with parameters showing transfer functions of individual elements.	Diagram	☐		DPD II						
Details of inverter mode control system, in block diagram form showing transfer functions of individual elements including parameters.	Diagram	☐		DPD II						
Details of converter transformer tap changer control system in block diagram form showing transfer functions of individual elements including parameters. (Only required for DC Converters and HVDC Systems connected to the National Electricity Transmission System .)	Diagram	☐		DPD II						
Details of AC filter and reactive compensation equipment control systems in block diagram form showing transfer functions of individual elements including parameters. (Only required for DC Converters and HVDC Systems connected to the National Electricity Transmission System .)	Diagram	☐		DPD II						
Details of any frequency and/or load control systems in block diagram form showing transfer functions of individual elements including parameters.	Diagram	☐		DPD II						
Details of any large or small signal modulating controls, such as power oscillation damping controls or sub-synchronous oscillation damping controls, that have not been submitted as part of the above control system data.	Diagram	☐		DPD II						
<u>Details of HVDC Converter unit models and/or control systems in block diagram form showing transfer functions of individual elements including parameters.</u>	Diagram	☐		DPD II						
<u>Details of AC component models and/or control systems in block diagram form showing transfer functions of individual elements including parameters.</u>	Diagram	☐		DPD II						
<u>Details of DC Grid models and/or control systems in block diagram form showing transfer functions of individual elements including parameters.</u>	Diagram	☐		DPD II						
<u>Details of Voltage and power controller and/or control systems in block diagram form showing transfer functions of individual elements including parameters.</u>	Diagram	☐		DPD II						
<u>Details of Special control features if applicable (eg power oscillation damping (POD) function, subsynchronous torsional interaction (SSTI) control and/or control systems in block diagram form showing transfer functions of individual elements including parameters.</u>	Diagram	☐		DPD II						
<u>Details of Multi terminal control, if applicable and/or control systems in block diagram form showing transfer functions of individual elements including parameters.</u>	Diagram	☐		DPD II						
<u>Details of HVDC System protection models as agreed between NGET the HVDC System Owner and/or control systems in block diagram form showing transfer functions of individual elements including parameters.</u>	Diagram	☐		DPD II						
<u>Transfer block diagram representation of the reactive power control at converter ends for a voltage source converter</u>	Diagram	☐		DPD II						
Issue 5 Revision 15 Transfer block diagram representation of the reactive power control at converter ends for a voltage source converter.	Diagram	☐		DPD II						

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SCHEDULE 1 – POWER GENERATING MODULE, GENERATING UNIT (OR CCGT MODULE), POWER PARK MODULE, DC CONNECTED POWER PARK MODULE, HVDC SYSTEM AND DC CONVERTER TECHNICAL DATA

PAGE 19 OF 19

Data Description	Units	DATA to RTL		Data Category	Operating configuration						
		CUSC Contract	CUSC App. Form		1	2	3	4	5	6	
LOADING PARAMETERS [PC.A.5.4.3.3]											
MW Export											
Nominal loading rate	MW/s			DPD I							
Maximum (emergency) loading rate	MW/s			DPD I							
MW Import											
Nominal loading rate	MW/s			DPD I							
Maximum (emergency) loading rate	MW/s			DPD I							
Maximum recovery time, to 90% of pre-fault loading, following an AC system fault or severe voltage depression.	s	☐		DPD II							
Maximum recovery time, to 90% of pre-fault loading, following a transient DC Network fault.	s	☐		DPD II							

NOTE: **Users** are referred to Schedules 5 & 14 which set down data required for all **Users** directly connected to the **National Electricity Transmission System**, including **Power Stations**. **Generators** undertaking **OTSDUW Arrangements** and are utilising an **OTSDUW DC Converter** are referred to Schedule 18.

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SCHEDULE 2 - GENERATION PLANNING PARAMETERS

PAGE 1 OF 3

This schedule contains the **Genset Generation Planning Parameters** required by **NET** to facilitate studies in **Operational Planning** timescales.

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For a **Generating Unit** including those within a **Power Generating Module** (other than a **Power Park Unit**) at a **Large Power Station** the information is to be submitted on a unit basis and for a **CCGT Module** or **Power Park Module** at a **Large Power Station** the information is to be submitted on a module basis, unless otherwise stated.

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Where references to **CCGT Modules** or **Power Park Modules** at a **Large Power Station** are made, the columns "G1" etc should be amended to read "M1" etc, as appropriate.

Power Station: _____

Generation Planning Parameters

DATA DESCRIPTION	UNITS	DATA to RTL		DATA CAT.	GENSET OR STATION DATA								
		CUSC Contract	CUSC App. Form		G1	G2	G3	G4	G5	G6	STN		
OUTPUT CAPABILITY <i>(PC.A.3.2.2)</i> Registered Capacity on a station and unit basis (on a station and module basis in the case of a CCGT Module or Power Park Module at a Large Power Station) <u>Maximum Capacity on a Power Generating Module basis and Synchronous Generating Unit basis and Registered Capacity on a Power Station basis</u>	MW	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD									
Minimum Generation (on a module basis in the case of a CCGT Module or Power Park Module at a Large Power Station) <u>Minimum Stable Operating Level (on a module basis in the case of a Power Generating Module at a Large Power Station)</u>	MW	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD									
MW available from Power Generating Modules and Generating Units or Power Park Modules in excess of Registered Capacity or Maximum Capacity	MW	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD									
REGIME UNAVAILABILITY These data blocks are provided to allow fixed periods of unavailability to be registered. Expected Running Regime. Is Power Station normally available for full output 24 hours per day, 7 days per week? If No please provide details of unavailability below. <i>(PC.A.3.2.2.)</i> Earliest Synchronising time: OC2.4.2.1(a) Monday Tuesday – Friday Saturday – Sunday Latest De-Synchronising time: OC2.4.2.1(a) Monday – Thursday Friday Saturday – Sunday	hr/min	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	OC2								-	
	hr/min	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	OC2									-
	hr/min	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	OC2									-
	hr/min	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	OC2									-
	hr/min	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	OC2									-
	hr/min	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	OC2									-
SYNCHRONISING PARAMETERS OC2.4.2.1(a)													

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Notice to Deviate from Zero (NDZ) after 48 hour Shutdown	Mins	■		OC2									
Station Synchronising Intervals (SI) after 48 hour Shutdown	Mins	■			-	-	-	-	-	-	-		
Synchronising Group (if applicable)	1 to 4	■		OC2									-

SCHEDULE 2 - GENERATION PLANNING PARAMETERS
PAGE 2 OF 3

DATA DESCRIPTION	UNITS	DATA to RTL		DATA CAT.	GENSET OR STATION DATA								
		CUSC Contract	CUSC App. Form		G1	G2	G3	G4	G5	G6	STN		
Synchronising Generation (SYG) after 48 hour Shutdown <i>PC.A.5.3.2(f) & OC2.4.2.1(a)</i>	MW	■		DPD II & OC2									-
De-Synchronising Intervals (Single value) <i>OC2.4.2.1(a)</i>	Mins	■		OC2	-	-	-	-	-	-	-	-	-
<u>RUNNING AND SHUTDOWN PERIOD LIMITATIONS:</u>													
Minimum Non Zero time (MNZT) after 48 hour Shutdown <i>OC2.4.2.1(a)</i>	Mins	■		OC2									
Minimum Zero time (MZT) <i>OC2.4.2.1(a)</i>	Mins			OC2									
Existing AGR Plant Flexibility Limit (Existing AGR Plant only)	No.			OC2									
80% Reactor Thermal Power (expressed as Gross-Net MW) (Existing AGR Plant only)	MW			OC2									
Frequency Sensitive AGR Unit Limit (Frequency Sensitive AGR Units only)	No.			OC2									
<u>RUN-UP PARAMETERS</u> <i>PC.A.5.3.2(f) & OC2.4.2.1(a)</i>													
Run-up rates (RUR) after 48 hour Shutdown: (See note 2 page 3) MW Level 1 (MWL1) MW Level 2 (MWL2)	MW MW	■ ■		OC2 OC2									- -
RUR from Synch. Gen to MWL1	MW/Mins	■		DPD II & OC2									
RUR from MWL1 to MWL2	MW/Mins	■		OC2									
RUR from MWL2 to RC	MW/Mins	■		OC2									
<u>Run-Down Rates (RDR):</u> (Note that for DPD only a single value of run-down rate from Registered Capacity to de-synch is required)													
MWL2 RDR from RC to MWL2	MW MW/Min	■ ■		OC2 DPD II OC2									
MWL1 RDR from MWL2 to MWL1	MW MW/Min	■ ■		OC2 OC2									
RDR from MWL1 to de-synch	MW/Min	■		OC2									

SCHEDULE 2 - GENERATION PLANNING PARAMETERS

PAGE 3 OF 3

DATA DESCRIPTION	UNITS	DATA to		DATA CAT.	GENSET OR STATION DATA						
		RTL	CUSC Contract		CUSC App. Form	G1	G2	G3	G4	G5	G6	STN
REGULATION PARAMETERS											
OC2.4.2.1(a)											
Regulating Range	MW	▪		DPD II							
Load rejection capability while still Synchronised and able to supply Load.	MW	▪		DPD II							
GAS TURBINE LOADING PARAMETERS:											
OC2.4.2.1(a)											
Fast loading	MW/Min	▪		OC2							
Slow loading	MW/Min	▪		OC2							
CCGT MODULE PLANNING MATRIX											
POWER PARK MODULE PLANNING MATRIX											
Power Park Module Active Power Output/ Intermittent Power Source Curve (eg MW output / Wind speed)				OC2	(please attach)						
				OC2	(please attach)						
				OC2	(please attach)						

NOTES:

- (1) To allow for different groups of **Gensets** within a **Power Station** (eg. **Gensets** with the same operator) each **Genset** may be allocated to one of up to four **Synchronising Groups**. Within each such **Synchronising Group** the single synchronising interval will apply but between **Synchronising Groups** a zero synchronising interval will be assumed.
- (2) The run-up of a **Genset** from synchronising block load to **Registered Capacity or Maximum Capacity** is represented as a three stage characteristic in which the run-up rate changes at two intermediate loads, MWL1 and MWL2. The values MWL1 & MWL2 can be different for each **Genset**.

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SCHEDULE 3 - LARGE POWER STATION OUTAGE PROGRAMMES, OUTPUT USABLE AND INFLEXIBILITY INFORMATION

PAGE 1 OF 3

(Also outline information on contracts involving **External Interconnections**)

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For a **Generating Unit** at a **Large Power Station** the information is to be submitted on a unit basis and for a **CCGT Module** or **Power Park Module** at a **Large Power Station** the information is to be submitted on a module basis, unless otherwise stated.

DATA DESCRIPTION		UNITS	TIME COVERED	UPDATE TIME	DATA CAT.	DATA to RTL
Power Station name: Generating Unit (or CCGT Module or Power Park Module at a Large Power Station) number:.... Registered Capacity: Large Power Station OUTAGE PROGRAMME Large Power Station OUTPUT USABLE						
<u>PLANNING FOR YEARS 3 - 7 AHEAD (OC2.4.1.2.1(a)(i), (e) & (j))</u>						
	Monthly average OU	MW	F. yrs 3 - 7	Week 24	SPD	CUSC Contract CUSC App. Form
Provisional outage programme comprising:			C. yrs 3 - 5	Week 2	OC2	
duration		weeks	"	"	"	■
preferred start date		date	"	"	"	■
earliest start date		date	"	"	"	■
latest finish date		date	"	"	"	■
	Weekly OU	MW	"	"	"	■
	(NGET response as detailed in OC2)		C. yrs 3 - 5	Week12)		■
	(Users' response to NGET suggested changes or potential outages)		C. yrs 3 - 5	Week14)		■
Updated provisional outage programme comprising:			C. yrs 3 - 5	Week 25	OC2	
duration		weeks	"	"	"	■
preferred start date		date	"	"	"	■
earliest start date		date	"	"	"	■
latest finish date		date	"	"	"	■
	Updated weekly OU	MW	"	"	"	■
	(NGET response as detailed in OC2 for		C. yrs 3 - 5	Week28)		■
	(Users' response to NGET suggested changes or update of potential outages)		C. yrs 3 - 5	Week31)		■
	(NGET further suggested revisions etc. (as detailed in OC2 for		C. yrs 3 - 5	Week42)		■
	Agreement of final Generation Outage Programme		C. yrs 3 - 5	Week 45	OC2	■
<u>PLANNING FOR YEARS 1 - 2 AHEAD (OC2.4.1.2.2(a) & OC2.4.1.2.2(i))</u>						
Update of previously agreed Final Generation Outage Programme			C. yrs 1 - 2	Week 10	OC2	
	Weekly OU	MW	"	"		■

**SCHEDULE 3 - LARGE POWER STATION OUTAGE PROGRAMMES, OUTPUT
USABLE AND INFLEXIBILITY INFORMATION**

PAGE 2 OF 3

DATA DESCRIPTION	UNITS	TIME COVERED	UPDATE TIME	DATA CAT	DATA to RTL
(NGET response as detailed in OC2 for (Users' response to NGET suggested changes or update of potential outages)		C. yrs 1 – 2	Week 12)		<input type="checkbox"/>
		C. yrs 1 – 2	Week 14)		<input type="checkbox"/>
Revised weekly OU		C. yrs 1 – 2	Week 34	OC2	<input type="checkbox"/>
(NGET response as detailed in OC2 for (Users' response to NGET suggested changes or update of potential outages)		C. yrs 1 – 2	Week 39)		<input type="checkbox"/>
		C. yrs 1 – 2	Week 46)		<input type="checkbox"/>
Agreement of final Generation Outage Programme		C. yrs 1 – 2	Week 48	OC2	<input type="checkbox"/>
<u>PLANNING FOR YEAR 0</u>					
Updated Final Generation Outage Programme		C. yr 0	Week 2 ahead to year end	1600 Weds.	OC2
OU at weekly peak	MW	"	"	"	
(NGET response as detailed in OC2 for (		C. yrs 0	Weeks 2 to 52 ahead	1600) Friday)	
()	
(NGET response as detailed in OC2 for (		Weeks 2 - 7	ahead	1600) Thurs)	
()	
Forecast return to services (Planned Outage or breakdown)	date	days 2 to 14	ahead	0900 daily	OC2
OU (all hours)	MW	"	"	"	OC2
(NGET response as detailed in OC2 for (		days 2 to 14	ahead	1600) daily)	
()	
<u>INFLEXIBILITY</u>					
Genset inflexibility	Min MW (Weekly)	Weeks 2 - 8	ahead	1600 Tues	OC2
(NGET response on Negative Reserve Active (Power Margin		"	"	1200) Friday)	
Genset inflexibility	Min MW (daily)	days 2 -14	ahead	0900 daily	OC2
(NGET response on Negative Reserve Active (Power Margin		"	"	1600) daily)	

**SCHEDULE 3 - LARGE POWER STATION OUTAGE PROGRAMMES, OUTPUT
USABLE AND INFLEXIBILITY INFORMATION
PAGE 3 OF 3**

DATA DESCRIPTION	UNITS	TIME COVERED	UPDATE TIME	DATA CAT	DATA to RTL
<u>OUTPUT PROFILES</u>					
					CUSC Contract CUSC App. Form
In the case of Large Power Stations whose output may be expected to vary in a random manner (eg. wind power) or to some other pattern (eg. Tidal) sufficient information is required to enable an understanding of the possible profile	MW	F. yrs 1 - 7	Week 24	SPD	

Notes: 1. The week numbers quoted in the Update Time column refer to standard weeks in the current year.

SCHEDULE 5 - USERS SYSTEM DATA

PAGE 1 OF 10

The data in this Schedule 5 is required from **Users** who are connected to the **National Electricity Transmission System** via a **Connection Point** (or who are seeking such a connection). **Generators** undertaking **OTSDUW** should use **DRC** Schedule 18 although they should still supply data under Schedule 5 in relation to their **User's System** up to the **Offshore Grid Entry Point**.

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DATA DESCRIPTION	UNITS	DATA to RTL		DATA CATEGORY
		CUSC Contract	CUSC App. Form	
<p>USERS SYSTEM LAYOUT (PC.A.2.2)</p> <p>A Single Line Diagram showing all or part of the User's System is required. This diagram shall include:-</p> <p>(a) all parts of the User's System, whether existing or proposed, operating at Supergrid Voltage, and in Scotland and Offshore, also all parts of the User System operating at 132kV,</p> <p>(b) all parts of the User's System operating at a voltage of 50kV, and in Scotland and Offshore greater than 30kV, or higher which can interconnect Connection Points, or split bus-bars at a single Connection Point,</p> <p>(c) all parts of the User's System between Embedded Medium Power Stations or Large Power Stations or Offshore Transmission Systems connected to the User's Subtransmission System and the relevant Connection Point or Interface Point,</p> <p>(d) all parts of the User's System at a Transmission Site.</p> <p>The Single Line Diagram may also include additional details of the User's Subtransmission System, and the transformers connecting the User's Subtransmission System to a lower voltage. With NGET's agreement, it may also include details of the User's System at a voltage below the voltage of the Subtransmission System.</p> <p>This Single Line Diagram shall depict the arrangement(s) of all of the existing and proposed load current carrying Apparatus relating to both existing and proposed Connection Points, showing electrical circuitry (ie. overhead lines, underground cables, power transformers and similar equipment), operating voltages. In addition, for equipment operating at a Supergrid Voltage, and in Scotland and Offshore also at 132kV, circuit breakers and phasing arrangements shall be shown.</p>		■	■	SPD
		■	■	
		■	■	
		■	■	

SCHEDULE 5 - USERS SYSTEM DATA
PAGE 2 OF 10

DATA DESCRIPTION	UNITS	DATA EXCH		DATA CATEGORY
		CUSC Contract	CUSC App. Form	
REACTIVE COMPENSATION (PC.A.2.4)				
For independently switched reactive compensation equipment not owned by a Transmission Licensee connected to the User's System at 132kV and above, and also in Scotland and Offshore , connected at 33kV and above, other than power factor correction equipment associated with a customers Plant or Apparatus :				
Type of equipment (eg. fixed or variable)	Text	▪	▪	SPD
Capacitive rating; or	MVA _r	▪	▪	SPD
Inductive rating; or	MVA _r	▪	▪	SPD
Operating range	MVA _r	▪	▪	SPD
Details of automatic control logic to enable operating characteristics to be determined	text and/or diagrams	▪	▪	SPD
Point of connection to User's System (electrical location and system voltage)	Text	▪	▪	SPD
SUBSTATION INFRASTRUCTURE (PC.A.2.2.6(b))				
For the infrastructure associated with any User's equipment at a Substation owned by a Transmission Licensee or operated or managed by NGET :-				
Rated 3-phase rms short-circuit withstand current	kA	▪	▪	SPD
Rated 1-phase rms short-circuit withstand current	kA	▪	▪	SPD
Rated Duration of short-circuit withstand	s	▪	▪	SPD
Rated rms continuous current	A	▪	▪	SPD

SCHEDULE 5 — USERS SYSTEM DATA
PAGE 3 OF 10

DATA DESCRIPTION		UNITS	DATA EXCH		DATA CATEGORY
LUMPED SUSCEPTANCES (PC.A.2.3)			CUSC Contract	CUSC App. Form	
Equivalent Lumped Susceptance required for all parts of the User's Subtransmission System which are not included in the Single Line Diagram .			■	■	
This should not include:			■	■	
(a)	independently switched reactive compensation equipment identified above.		■	■	
(b)	any susceptance of the User's System inherent in the Demand (Reactive Power) data provided in Schedule 1 (Generator Data) or Schedule 11 (Connection Point data).		■	■	
Equivalent lumped shunt susceptance at nominal Frequency .		% on 100 MVA	■	■	SPD

USERS SYSTEM DATA

Transformer Data (PC-A.2.2.5) (■ CUSC Contract & ■ CUSC Application Form)

The data below is all **Standard Planning Data**, and details should be shown below of all transformers shown on the **Single Line Diagram**. Details of Winding Arrangement, Tap Changer and earthing details are only required for transformers connecting the **User's** higher voltage system with its **Primary Voltage System**.

SCHEDULE 5 — USERS SYSTEM DATA
PAGE 5 OF 10

Years valid	Name of Node or Connection Point	Transformer	Rating MVA	Voltage Ratio		Positive Phase Sequence Reactance % on Rating			Positive Phase Sequence Resistance % on Rating			Zero Sequence Reactance % on Rating	Winding Arr.	Tap Changer			Earthing Details (delete as app.)*
				HV	LV	Max. Tap	Min. Tap	Nom. Tap	Max. Tap	Min. Tap	Nom. Tap			range +% to -%	step size %	type (delete)	
																	Direct/Res/Rea
																	Direct/Res/Rea
																	Direct/Res/Rea
																	Direct/Res/Rea
																	Direct/Res/Rea
																	Direct/Res/Rea
																	Direct/Res/Rea

*If Resistance or Reactance please give impedance value

Notes

1. Data should be supplied for the current, and each of the seven succeeding Financial Years. This should be done by showing for which years the data is valid in the first column of the Table
2. For a transformer with two secondary windings, the positive and zero phase sequence leakage impedances between the HV and LV1, HV and LV2, and LV1 and LV2 windings are required.

USER'S SYSTEM DATA

Switchgear Data (PC-A.2.2.6(a)) (CUSC Contract & CUSC Application Form)

The data below is all **Standard Planning Data**, and should be provided for all switchgear (ie. circuit breakers, load disconnectors and disconnectors) operating at a **Supergrid Voltage**, and also in Scotland and **Offshore**, operating at 132kV. In addition, data should be provided for all circuit breakers irrespective of voltage located at a **Connection Site** which is owned by a **Transmission Licensee** or operated or managed by **NGET**.

SCHEDULE 5 — USERS SYSTEM DATA
PAGE 6 OF 10

Years Valid	Connect-ion Point	Switch No.	Rated Voltage kV rms	Operating Voltage kV rms	Rated short-circuit breaking current		Rated short-circuit peak making current		Rated rms continuous current (A)	DC time constant at testing of asymmetrical breaking ability(s)
					3 Phase kA rms	1 Phase kA rms	3 Phase kA peak	1 Phase kA peak		

Notes

1. Rated Voltage should be as defined by IEC 694.
2. Data should be supplied for the current, and each of the seven succeeding Financial Years. This should be done by showing for which years the data is valid in the first column of the Table

SCHEDULE 5 —USERS SYSTEM DATA
PAGE 7 OF 10

DATA DESCRIPTION	UNITS	DATA to RTL		DATA CATEGORY
		CUSC Contract	CUSC App. Form	
PROTECTION SYSTEMS (PC.A.6.3)				
The following information relates only to Protection equipment which can trip or inter-trip or close any Connection Point circuit breaker or any Transmission circuit breaker. The information need only be supplied once, in accordance with the timing requirements set out in PC.A.1.4 (b) and need not be supplied on a routine annual basis thereafter, although NGET should be notified if any of the information changes.				
(a) A full description, including estimated settings, for all relays and Protection systems installed or to be installed on the User's System ;		▪		DPD II
(b) A full description of any auto-reclose facilities installed or to be installed on the User's System , including type and time delays;		▪		DPD II
(c) A full description, including estimated settings, for all relays and Protection systems installed or to be installed on the Power Generating Module, Power Park Module or Generating Unit's generator transformer, unit transformer, station transformer and their associated connections;		▪		DPD II
(d) For Generating Units (other than Power Park Units) having a circuit breaker at the generator terminal voltage clearance times for electrical faults within the Generating Unit zone must be declared.		▪		DPD II
(e) Fault Clearance Times: Most probable fault clearance time for electrical faults on any part of the Users System directly connected to the National Electricity Transmission System .	mSec	▪		DPD II

DATA DESCRIPTION	UNITS	DATA to RTL		DATA CATEGORY
		CUSC Contract	CUSC App. Form	
POWER PARK MODULE/UNIT PROTECTION SYSTEMS				
Details of settings for the Power Park Module/Unit protection relays (to include): (PC.A.5.4.2(f))				
(a) Under frequency,		▪		DPD II
(b) Over Frequency,		▪		DPD II
(c) Under Voltage, Over Voltage,		▪		DPD II
(d) Rotor Over current		▪		DPD II
(e) Stator Over current,.		▪		DPD II
(f) High Wind Speed Shut Down Level		▪		DPD II
(g) Rotor Underspeed		▪		DPD II
(h) Rotor Overspeed		▪		DPD II

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SCHEDULE 5 - USERS SYSTEM DATA
PAGE 8 OF 10

Information for Transient Overvoltage Assessment (DPD I) (PC.A.6.2 ■ CUSC Contract)

The information listed below may be requested by **NGET** from each **User** with respect to any **Connection Site** between that **User** and the **National Electricity Transmission System**. The impact of any third party **Embedded** within the **Users System** should be reflected.

- (a) Busbar layout plan(s), including dimensions and geometry showing positioning of any current and voltage transformers, through bushings, support insulators, disconnectors, circuit breakers, surge arresters, etc. Electrical parameters of any associated current and voltage transformers, stray capacitances of wall bushings and support insulators, and grading capacitances of circuit breakers;
- (b) Electrical parameters and physical construction details of lines and cables connected at that busbar. Electrical parameters of all plant e.g., transformers (including neutral earthing impedance or zig-zag transformers if any), series reactors and shunt compensation equipment connected at that busbar (or to the tertiary of a transformer) or by lines or cables to that busbar;
- (c) Basic insulation levels (BIL) of all **Apparatus** connected directly, by lines or by cables to the busbar;
- (d) Characteristics of overvoltage **Protection** devices at the busbar and at the termination points of all lines, and all cables connected to the busbar;
- (e) Fault levels at the lower voltage terminals of each transformer connected directly or indirectly to the **National Electricity Transmission System** without intermediate transformation;
- (f) The following data is required on all transformers operating at **Supergrid Voltage** throughout **Great Britain** and, in Scotland and **Offshore**, also at 132kV: three or five limb cores or single phase units to be specified, and operating peak flux density at nominal voltage.
- (g) An indication of which items of equipment may be out of service simultaneously during **Planned Outage** conditions.

Harmonic Studies (DPD I) (PC.A.6.4 ■ CUSC Contract)

The information given below, both current and forecast, where not already supplied in this Schedule 5 may be requested by **NGET** from each **User** if it is necessary for **NGET** to evaluate the production/magnification of harmonic distortion on the **National Electricity Transmission System** and **User's** systems. The impact of any third party **Embedded** within the **User's System** should be reflected:

- (a) Overhead lines and underground cable circuits of the **User's Subtransmission System** must be differentiated and the following data provided separately for each type:
 - Positive phase sequence resistance
 - Positive phase sequence reactance
 - Positive phase sequence susceptance
- (b) for all transformers connecting the **User's Subtransmission System** to a lower voltage:
 - Rated MVA
 - Voltage Ratio
 - Positive phase sequence resistance
 - Positive phase sequence reactance

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SCHEDULE 5 — USERS SYSTEM DATA
PAGE 9 OF 10

(c) at the lower voltage points of those connecting transformers:

Equivalent positive phase sequence susceptance

Connection voltage and MVA rating of any capacitor bank and component design parameters if configured as a filter

Equivalent positive phase sequence interconnection impedance with other lower voltage points

The minimum and maximum **Demand** (both MW and MVA) that could occur

Harmonic current injection sources in Amps at the Connection voltage points

Details of traction loads, eg connection phase pairs, continuous variation with time, etc.

(d) an indication of which items of equipment may be out of service simultaneously during **Planned Outage** conditions

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Voltage Assessment Studies (DPD I) (PC.A.6.5 ■ CUSC Contract)

The information listed below, where not already supplied in this Schedule 5, may be requested by **NGET** from each **User** with respect to any **Connection Site** if it is necessary for **NGET** to undertake detailed voltage assessment studies (eg to examine potential voltage instability, voltage control co-ordination or to calculate voltage step changes). The impact of any third party **Embedded** within the **Users System** should be reflected:

(a) For all circuits of the **User's Subtransmission System**:

Positive Phase Sequence Reactance

Positive Phase Sequence Resistance

Positive Phase Sequence Susceptance

MVA rating of any reactive compensation equipment

(b) for all transformers connecting the **User's Subtransmission System** to a lower voltage:

Rated MVA

Voltage Ratio

Positive phase sequence resistance

Positive Phase sequence reactance

Tap-changer range

Number of tap steps

Tap-changer type: on-load or off-circuit

AVC/tap-changer time delay to first tap movement

AVC/tap-changer inter-tap time delay

SCHEDULE 5 — USERS SYSTEM DATA
PAGE 10 OF 10

- (c) at the lower voltage points of those connecting transformers:-
- Equivalent positive phase sequence susceptance
 - MVA_r rating of any reactive compensation equipment
 - Equivalent positive phase sequence interconnection impedance with other lower voltage points
 - The maximum **Demand** (both MW and MVA_r) that could occur
 - Estimate of voltage insensitive (constant power) load content in % of total load at both winter peak and 75% off-peak load conditions

Short Circuit Analyses:(DPD I) (PC.A.6.6 ■ CUSC Contract)

The information listed below, both current and forecast, and where not already supplied under this Schedule 5, may be requested by **NGET** from each **User** with respect to any **Connection Site** where prospective short-circuit currents on equipment owned by a **Transmission Licensee** or operated or managed by **NGET** are close to the equipment rating. The impact of any third party **Embedded** within the **User's System** should be reflected:-

- (a) For all circuits of the **User's Subtransmission System**:
- Positive phase sequence resistance
 - Positive phase sequence reactance
 - Positive phase sequence susceptance
 - Zero phase sequence resistance (both self and mutuals)
 - Zero phase sequence reactance (both self and mutuals)
 - Zero phase sequence susceptance (both self and mutuals)
- (b) for all transformers connecting the **User's Subtransmission System** to a lower voltage:
- Rated MVA
 - Voltage Ratio
 - Positive phase sequence resistance (at max, min and nominal tap)
 - Positive Phase sequence reactance (at max, min and nominal tap)
 - Zero phase sequence reactance (at nominal tap)
 - Tap changer range
 - Earthing method: direct, resistance or reactance
 - Impedance if not directly earthed
- (c) at the lower voltage points of those connecting transformers:-
- The maximum **Demand** (in MW and MVA_r) that could occur
- Short-circuit infeed data in accordance with PC.A.2.5.6(a) unless the **User's** lower voltage network runs in parallel with the **Subtransmission System**, when to prevent double counting in each node infeed data, a π equivalent comprising the data items of PC.A.2.5.6(a) for each node together with the positive phase sequence interconnection impedance between the nodes shall be submitted.

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SCHEDULE 6 — USERS OUTAGE INFORMATION

PAGE 1 OF 2

DATA DESCRIPTION	UNITS	DATA to RTL		TIMESCALE COVERED	UPDATE TIME	DATA CAT.
		CUSC Contract	CUSC App. Form			
<p>Details are required from Network Operators of proposed outages in their User Systems and from Generators with respect to their outages, which may affect the performance of the Total System (eg. at a Connection Point or constraining Embedded Large Power Stations or constraints to the Maximum Import Capacity or Maximum Export Capacity at an Interface Point) (OC2.4.1.3.2(a) & (b))</p> <p>(NGET advises Network Operators of National Electricity Transmission System outages affecting their Systems)</p> <p>Network Operator informs NGET if unhappy with proposed outages)</p> <p>(NGET draws up revised National Electricity Transmission System (outage plan advises Users of operational effects)</p> <p>Generators and Non-Embedded Customers provide Details of Apparatus owned by them (other than Gensets) at each Grid Supply Point (OC2.4.1.3.3)</p> <p>(NGET advises Network Operators of outages affecting their Systems) (OC2.4.1.3.3)</p> <p>Network Operator details of relevant outages affecting the Total System (OC2.4.1.3.3)</p> <p>Details of:- Maximum Import Capacity for each Interface Point Maximum Export Capacity for each Interface Point Changes to previously declared values of the Interface Point Target Voltage/Power Factor (OC2.4.1.3.3(c)).</p> <p>(NGET informs Users of aspects that may affect their Systems) (OC2.4.1.3.3)</p> <p>Users inform NGET if unhappy with aspects as notified (OC2.4.1.3.3)</p> <p>(NGET issues final National Electricity Transmission System (outage plan with advice of operational) (OC2.4.1.3.3) (effects on Users System)</p> <p>Generator, Network Operator and Non-Embedded Customers to inform NGET of changes to outages previously requested</p> <p>Details of load transfer capability of 12MW or more between Grid Supply Points in England and Wales and 10MW or more between Grid Supply Points in Scotland.</p> <p>Details of:- Maximum Import Capacity for each Interface Point Maximum Export Capacity for each Interface Point Changes to previously declared values of the Interface Point Target Voltage/Power Factor</p>		■		Years 2-5	Week 8 (Network Operator etc) Week 13 (Generators)	OC2 OC2
				Years 2-5	Week 28)	
		■		"	Week 30	OC2
				"	Week 34)	
		■		Year 1	Week 13	OC2
				Year 1	Week 28)	
		■		Year 1	Week 32	OC2
	MVA / MW MVA / MW V (unless power factor control			Year 1	Week 32	OC2
				Year 1	Week 34)	
		■		Year 1	Week 36	OC2
		■		Year 1	Week 49	OC2
				Week 8 ahead to year end	As occurring	OC2
				Within Yr 0	As NGET request	OC2
	MVA / MW MVA / MW V (unless power factor control			Within Yr 0	As occurring	OC2

Note: Users should refer to **OC2** for full details of the procedure summarised above and for the information which **NGET** will provide on the **Programming Phase**.

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SCHEDULE 6 — USERS OUTAGE INFORMATION

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The data below is to be provided to **NGET** as required for compliance with the European Commission Regulation No 543/2013 (OC2.4.2.3). Data provided under Article Numbers 7.1(a), 7.1(b), 15.1(a), 15.1(b), and 15.1(c) and 15.1(d) is to be provided using **MODIS**.

ECR ARTICLE No.	DATA DESCRIPTION	USERS PROVIDING DATA	FREQUENCY OF SUBMISSION
7.1(a)	Planned unavailability of the Apparatus belonging to a Non-Embedded Customer where OC2.4.7 (a) applies <ul style="list-style-type: none"> - Energy Identification Code (EIC)* - Unavailable demand capacity during the event (MW) - Estimated start date and time (dd.mm.yy hh:mm) - Estimated end date and time (dd.mm.yy hh:mm) - Reason for unavailability from the list below: <ul style="list-style-type: none"> . Maintenance . Failure . Shutdown . Other 	Non-Embedded Customer	To be received by NGET as soon as reasonably possible but in any case to facilitate publication of data no later than 1 hour after a decision has been made by the Non-Embedded Customer regarding the planned unavailability
7.1(b)	Changes in actual availability of the Apparatus belonging to a Non-Embedded Customer where OC2.4.7 (b) applies <ul style="list-style-type: none"> - Energy Identification Code (EIC)* - Unavailable demand capacity during the event (MW) - Start date and time (dd.mm.yy hh:mm) - Estimated end date and time (dd.mm.yy hh:mm) - Reason for unavailability from the list below : <ul style="list-style-type: none"> . Maintenance . Failure . Shutdown . Other 	Non-Embedded Customer	To be received by NGET as soon as reasonably possible but in any case to facilitate publication of data no later than 1 hour after the change in actual availability
8.1	Year Ahead Forecast Margin information as provided in accordance with OC2.4.1.2.2 <ul style="list-style-type: none"> - Output Usable 	Generator	In accordance with OC2.4.1.2.2
14.1(a)	Registered Capacity or Maximum Capacity for Generating Units or Power Generating Modules with greater than 1 MW Registered Capacity or Maximum Capacity provided in accordance with PC.4.3.1 and PC.A.3.4.3 or PC.A.3.1.4 <ul style="list-style-type: none"> - Registered Capacity or Maximum Capacity (MW) - Production type (from that listed under PC.A.3.4.3) 	Generator	Week 24
14.1(b)	Power Station Registered Capacity for units with equal or greater than 100 MW Registered Capacity provided in accordance with PC.4.3.1 and PC.A.3.4.3 <ul style="list-style-type: none"> - Power Station name - Location of Generating Unit - Production type (from that listed under PC.A.3.4.3) - Voltage connection levels - Registered Capacity or Maximum Capacity (MW) 	Generator	Week 24

14.1(c)	<p>Estimated output of Active Power of a BM Unit or Generating Unit for each per Settlement Period of the next Operational Day provided in accordance with BC1.4.2</p> <p>- Physical Notification</p>	Generator	In accordance with BC1.4.2
15.1(a)	<p>Planned unavailability of a Generating Unit where OC2.4.7(c) applies</p> <p>- Power Station name - Generating Unit and/or Power Generating Module name - Location of Generating Unit and/or Power Generating Module - Generating Unit Registered Capacity (MW) - Production type (from that listed under PC.A.3.4.3) - Output Usable (MW) during the event - Start date and time (dd.mm.yy hh:mm) - Estimated end date and time (dd.mm.yy hh:mm) - Reason for unavailability from the list below: . Maintenance . Shutdown . Other</p>	Generator	To be received by NGET as soon as reasonably possible but in any case to facilitate publication of data no later than 1 hour after a decision has been made by the Generator regarding the planned unavailability
15.1(b)	<p>Changes in availability of a Generating Unit and/or Power Generating Module where OC2.4.7 (d) applies</p> <p>- Power Station name - Generating Unit and/or Power Generating Module name - Location of Generating Unit and/or Power Generating Module - Generating Unit Registered Capacity and Power Generating Module Maximum Capacity (MW) - Production type (from that listed under PC.A.3.4.3) - Maximum Export Limit (MW) during the event - Start date and time (dd.mm.yy hh:mm) - Estimated end date and time (dd.mm.yy hh:mm) - Reason for unavailability from the list below: . Maintenance . Shutdown . Other</p>	Generator	To be received by NGET as soon as reasonably possible but in any case to facilitate publication of data no later than 1 hour after the change in actual availability
15.1(c)	<p>Planned unavailability of a Power Station where OC2.4.7(e) applies</p> <p>- Power Station name - Location of Power Station - Power Station Registered Capacity (MW) - Production type (from that listed under PC.A.3.4.3) - Power Station aggregated Output Usable (MW) during the event - Start date and time (dd.mm.yy hh:mm) - Estimated end date and time (dd.mm.yy hh:mm) - Reason for unavailability from the list below: . Maintenance . Shutdown . Other</p>	Generator	To be received by NGET as soon as reasonably possible but in any case to facilitate publication of data no later than 1 hour after a decision has been made by the Generator regarding the planned unavailability
15.1(d)	<p>Changes in actual availability of a Power Station where OC2.4.7 (f) applies</p> <p>- Power Station name - Location of Power Station - Power Station Registered Capacity (MW) - Production type (from that listed under PC.A.3.4.3) - Power Station aggregated Maximum Export Limit (MW) during the event - Start date and time (dd.mm.yy hh:mm) - Estimated end date and time (dd.mm.yy hh:mm) - Reason for unavailability from the list below: . Maintenance . Shutdown . Other</p>	Generator	To be received by NGET as soon as reasonably possible but in any case to facilitate publication of data no later than 1 hour after the change in actual availability

* Energy Identification Coding (EIC) is a coding scheme that is approved by ENTSO-E for standardised electronic data interchanges and is utilised for reporting to the Central European Transparency Platform. NGET will act as the Local Issuing Office for IEC in respect of GB.

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SCHEDULE 7 - LOAD CHARACTERISTICS AT GRID SUPPLY POINTS

PAGE 1 OF 1

All data in this schedule 7 is categorised as **Standard Planning Data (SPD)** and is required for existing and agreed future connections. This data is only required to be updated when requested by **NGET**.

DATA DESCRIPTION	UNITS	DATA to		DATA FOR FUTURE YEARS							
		RTL		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5	Yr 6	Yr 7	
FOR ALL TYPES OF DEMAND FOR EACH GRID SUPPLY POINT		CUSC Contract	CUSC App. Form								
The following information is required infrequently and should only be supplied, wherever possible, when requested by NGET (PC.A.4.7)		<input type="checkbox"/>									
Details of individual loads which have Characteristics significantly different from the typical range of domestic or commercial and industrial load supplied: (PC.A.4.7(a))		<input type="checkbox"/>		(Please Attach)							
Sensitivity of demand to fluctuations in voltage And frequency on National Electricity Transmission System at time of peak Connection Point Demand (Active Power) (PC.A.4.7(b))		<input type="checkbox"/>									
Voltage Sensitivity (PC.A.4.7(b))	MW/kV MVAr/kV	<input type="checkbox"/>									
Frequency Sensitivity (PC.A.4.7(b))	MW/Hz MVAr/Hz	<input type="checkbox"/>									
Reactive Power sensitivity should relate to the Power Factor information given in Schedule 11 (or for Generators , Schedule 1) and note 6 on Schedule 11 relating to Reactive Power therefore applies: (PC.A.4.7(b))		<input type="checkbox"/>									
Phase unbalance imposed on the National Electricity Transmission System (PC.A.4.7(d))											
- maximum	%	<input type="checkbox"/>									
- average	%	<input type="checkbox"/>									
Maximum Harmonic Content imposed on National Electricity Transmission System (PC.A.4.7(e))	%	<input type="checkbox"/>									
Details of any loads which may cause Demand Fluctuations greater than those permitted under Engineering Recommendation P28, Stage 1 at the Point of Common Coupling including Flicker Severity (Short Term) and Flicker Severity (Long Term) (PC.A.4.7(f))		<input type="checkbox"/>									

SCHEDULE 8 - DATA SUPPLIED BY BM PARTICIPANTS
PAGE 1 OF 1

CODE	DESCRIPTION
BC1	Physical Notifications
BC1	Quiescent Physical Notifications
BC1 & BC2	Export and Import Limits
BC1	Bid-Offer Data
BC1	Dynamic Parameters (Day Ahead)
BC2	Dynamic Parameters (For use in Balancing Mechanism)
BC1 & BC2	Other Relevant Data
BC1	Joint BM Unit Data

- No information collated under this Schedule will be transferred to the **Relevant Transmission Licensees**

SCHEDULE 9 - DATA SUPPLIED BY NGET TO USERS

PAGE 1 OF 1

(Example of data to be supplied)

CODE	DESCRIPTION
CC	Operation Diagram
CC	Site Responsibility Schedules
PC	Day of the peak National Electricity Transmission System Demand Day of the minimum National Electricity Transmission System Demand
OC2	Surpluses and OU requirements for each Generator over varying timescales Equivalent networks to Users for Outage Planning Negative Reserve Active Power Margins (when necessary) Operating Reserve information
BC1	Demand Estimates, Indicated Margin and Indicated Imbalance , indicative Synchronising and Desynchronising times of Embedded Power Stations to Network Operators , special actions.
BC2	Bid-Offer Acceptances , Ancillary Services instructions to relevant Users , Emergency Instructions
BC3	Location, amount, and Low Frequency Relay settings of any Low Frequency Relay initiated Demand reduction for Demand which is Embedded .

- No information collated under this Schedule will be transferred to the **Relevant Transmission Licensees**

DATA TO BE SUPPLIED BY NGET TO USERS

PURSUANT TO THE TRANSMISSION LICENCE

1. The **Transmission Licence** requires **NGET** to publish annually the **Seven Year Statement** which is designed to provide **Users** and potential **Users** with information to enable them to identify opportunities for continued and further use of the **National Electricity Transmission System**.

When **an User** is considering a development at a specific site, certain additional information may be required in relation to that site which is of such a level of detail that it is inappropriate to include it in the **Seven Year Statement**. In these circumstances the **User** may contact **NGET** who will be pleased to arrange a discussion and the provision of such additional information relevant to the site under consideration as the **User** may reasonably require.

2. The **Transmission Licence** also requires **NGET** to offer terms for an agreement for connection to and use of the **National Electricity Transmission System** and further information will be given by **NGET** to the potential **User** in the course of the discussions of the terms of such an agreement.

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SCHEDULE 10 - DEMAND PROFILES AND ACTIVE ENERGY DATA
PAGE 1 OF 2

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).

DATA DESCRIPTION	F. Yr. 0	F. Yr. 1	F. Yr. 2	F. Yr. 3	F. Yr. 4	F. Yr. 5	F. Yr. 6	F. Yr. 7	UPDATE TIME	DATA CAT
<u>Demand Profiles</u>	<i>(PC.A.4.2) (■ – CUSC Contract & ■ CUSC Application Form)</i>									
Total User's system profile (please delete as applicable)	Day of User's annual Maximum demand at Annual ACS Conditions (MW)									
	Day of annual peak of National Electricity Transmission System Demand at Annual ACS Conditions (MW)									
	Day of annual minimum National Electricity Transmission System Demand at average conditions (MW)									
0000 : 0030									Wk.24	SPD
0030 : 0100									:	:
0100 : 0130									:	:
0130 : 0200									:	:
0200 : 0230									:	:
0230 : 0300									:	:
0300 : 0330									:	:
0330 : 0400									:	:
0400 : 0430									:	:
0430 : 0500									:	:
0500 : 0530									:	:
0530 : 0600									:	:
0600 : 0630									:	:
0630 : 0700									:	:
0700 : 0730									:	:
0730 : 0800									:	:
0800 : 0830									:	:
0830 : 0900									:	:
0900 : 0930									:	:
0930 : 1000									:	:
1000 : 1030									:	:
1030 : 1100									:	:
1100 : 1130									:	:
1130 : 1200									:	:
1200 : 1230									:	:
1230 : 1300									:	:
1300 : 1330									:	:
1330 : 1400									:	:
1400 : 1430									:	:
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1600 : 1630									:	:
1630 : 1700									:	:
1700 : 1730									:	:
1730 : 1800									:	:
1800 : 1830									:	:
1830 : 1900									:	:
1900 : 1930									:	:
1930 : 2000									:	:
2000 : 2030									:	:
2030 : 2100									:	:
2100 : 2130									:	:
2130 : 2200									:	:
2200 : 2230									:	:
2230 : 2300									:	:
2300 : 2330									:	:
2330 : 0000									:	:

SCHEDULE 10 - DEMAND PROFILES AND ACTIVE ENERGY DATA
PAGE 2 OF 2

DATA DESCRIPTION	Out-turn		F.Yr. 0	Update Time	Data Cat	DATA to RTL	
	Actual	Weather Corrected.				CUSC Contract	CUSC App. Form
(PC.A.4.3) Active Energy Data Total annual Active Energy requirements under average conditions of each Network Operator and each Non-Embedded Customer in the following categories of Customer Tariff:- LV1 LV2 LV3 EHV HV Traction Lighting User System Losses				Week 24	SPD	■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■	■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■
Active Energy from Embedded Small Power Stations and Embedded Medium Power Stations						■	■

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NOTES:

- 'F. yr.' means '**Financial Year**'
- Demand and Active Energy Data (General)**

Demand and Active Energy data should relate to the point of connection to the **National Electricity Transmission System** and 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**. Auxiliary demand of **Embedded Power Stations** should be included in the demand data submitted by the **User** at the **Connection Point**. **Users** should refer to the **PC** for a full definition of the **Demand** to be included.
- Demand** profiles and **Active Energy** data should be for the total **System** of the **Network Operator**, including all **Connection Points**, and for each **Non-Embedded Customer**. **Demand Profiles** should give the numerical maximum demand that in the **User's** opinion could reasonably be imposed on the **National Electricity Transmission System**.
- In addition the demand profile is to be supplied for such days as **NGET** may specify, but such a request is not to be made more than once per calendar year.

SCHEDULE 11 - CONNECTION POINT DATA
PAGE 1 OF 3

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 National Electricity Transmission System Demand (specified by NGET) c) minimum National Electricity Transmission System Demand (specified by NGET) d) maximum Demand during Access Period e) specified by either NGET or ean User
Name of Transmission Interface Circuit out of service during Access Period (if reqd).	PC.A.4.1.4.2

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DATA DESCRIPTION (CUSC Contract □ & CUSC Application Form ■)	Outturn	Outturn Weather Corrected	F.Yr	DATA CAT								
			1	2	3	4	5	6	7	8		
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 (MVA _r)												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:	Outturn	Outturn Weather Corrected	F.Yr	F.Yr	F.Yr	F.Yr	F.Yr	F.Yr	F.Yr	F.Yr	DATA CAT
			1	2	3	4	5	6	7	8	
Demand at associated Connection Point (MW)											PC.A.4.3.1
Demand at associated Connection Point (MVA _r)											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)

SCHEDULE 11 - CONNECTION POINT DATA
PAGE 2 OF 3

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)
Generating Unit											PC.A.3.2.2(c)
System Constrained Capacity											PC.A.3.2.2(c)(i)
Reactive Despatch Network Restriction											PC.A.3.2.2(c)(ii)
Where the Network Operator's System places a constraint on the capacity of an Offshore Transmission System at an Interface Point											
Offshore Transmission System Name											PC.A.3.2.2(c)
Interface Point Name											PC.A.3.2.2(c)
Maximum Export Capacity											PC.A.3.2.2(c)
Maximum Import Capacity											PC.A.3.2.2(c)

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SCHEDULE 11 - CONNECTION POINT DATA
PAGE 3 OF 3

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 **National Electricity Transmission System**. **Users** may submit the **Demand** data at each node on the **Single Line Diagram** instead of at a **Connection Point** as long as the **User** reasonably believes 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.
6. Where a **Reactive Despatch Network Restriction** is in place which requires the generator to maintain a target voltage set point this should be stated as an alternative to the size of the **Reactive Despatch Network Restriction**.

SCHEDULE 12 - DEMAND CONTROL
PAGE 1 OF 2

The following information is required from each **Network Operator** and where indicated with an asterisk from **Externally Interconnected System Operators** and/or **Interconnector Users** and a **Pumped Storage Generator**. Where indicated with a double asterisk, the information is only required from **Suppliers**.

DATA DESCRIPTION	UNITS		UPDATE TIME	
<u>Demand Control</u>				
Demand met or to be relieved by Demand Control (averaging at the Demand Control Notification Level or more over a half hour) at each Connection Point .				
Demand Control at time of National Electricity Transmission System weekly peak demand				
Amount	MW	)F.yrs 0 to 5	Week 24	OC1
Duration	Min)		
For each half hour	MW	Wks 2-8 ahead	1000 Mon	OC1
For each half hour	MW	Days 2-12 ahead	1200 Wed	OC1
For each half hour	MW	Previous calendar day	0600 daily	OC1
**Customer Demand Management (at the Customer Demand Management Notification Level or more at the Connection Point)				
For each half hour	MW	Any time in Control Phase		OC1
For each half hour	MW	Remainder of period	When changes occur to previous plan	OC1
For each half hour	MW	Previous calendar day	0600 daily	OC1
**In Scotland, Load Management Blocks For each block of 5MW or more, for each half hour				
	MW	For the next day	11:00	OC1

SCHEDULE 12 - DEMAND CONTROL
PAGE 1 OF 2

DATA DESCRIPTION	UNITS	TIME COVERED	UPDATE TIME	DATA CAT.
*Demand Control or Pump Tripping Offered as Reserve				
Magnitude of Demand or pumping load which is tripped	MW	Year ahead from week 24	Week 24	DPD I
System Frequency at which tripping is initiated	Hz	"	"	"
Time duration of System Frequency below trip setting for tripping to be initiated	S	"	"	"
Time delay from trip initiation to Tripping	S	"	"	"
Emergency Manual Load Disconnection				
Method of achieving load disconnection	Text	Year ahead from week 24	Annual in week 24	OC6
Annual ACS Peak Demand (Active Power) at Connection Point (requested under Schedule 11 - repeated here for reference)	MW	"	"	"
Cumulative percentage of Connection Point Demand (Active Power) which can be disconnected by the following times from an instruction from NGET				
5 mins	%	"	"	"
10 mins	%	"	"	"
15 mins	%	"	"	"
20 mins	%	"	"	"
25 mins	%	"	"	"
30 mins	%	"	"	"

Notes:

- Network Operators** may delay the submission until calendar week 28.
- No information collated under this Schedule will be transferred to the **Relevant Transmission Licensees** (or **Generators** undertaking **OTSDUW**).

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SCHEDULE 12A - AUTOMATIC LOW FREQUENCY DEMAND DISCONNECTION
PAGE 1 OF 1

Time Covered: Year ahead from week 24
 Update Time: Annual in week 24

Data Category: OC6

Grid Supply Point	GSP Demand MW	Low Frequency Demand Disconnection Blocks MW									Residual demand MW
		1 48.8Hz	2 48.75Hz	3 48.7Hz	4 48.6Hz	5 48.5Hz	6 48.4Hz	7 48.2Hz	8 48.0Hz	9 47.8Hz	
GSP1											
GSP2											
GSP3											
Total demand disconnected MW per block											
%											
Total demand disconnection		MW (% of aggregate demand of									MW)

Note: All demand refers to that at the time of forecast **National Electricity Transmission System** peak demand.
Network Operators may delay the submission until calendar week 28
 No information collated under this schedule will be transferred to the **Relevant Transmission Licensees** (or **Generators** undertaking **OTSDUW**).

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SCHEDULE 13 - FAULT INFEEED DATA

PAGE 1 OF 2

The data in this Schedule 13 is all **Standard Planning Data**, and is required from all **Users** other than **Generators** who are connected to the **National Electricity Transmission System** via a **Connection Point** (or who are seeking such a connection). A data submission is to be made each year in Week 24 (although **Network Operators** may delay the submission until Week 28). A separate submission is required for each node included in the **Single Line Diagram** provided in Schedule 5.

DATA DESCRIPTION	UNITS	F.Yr.	DATA to									
		0	1	2	3	4	5	6	7	RTL		
SHORT CIRCUIT INFEEED TO THE NATIONAL ELECTRICITY TRANSMISSION SYSTEM FROM USERS SYSTEM AT A CONNECTION POINT											CUSC Contract	CUSC App. Form
<i>(P.C.A.2.5)</i>												
Name of node or Connection Point											<input type="checkbox"/>	<input checked="" type="checkbox"/>
Symmetrical three phase short-circuit current infeed												
- at instant of fault	kA										<input type="checkbox"/>	<input checked="" type="checkbox"/>
- after subtransient fault current contribution has substantially decayed	Ka										<input type="checkbox"/>	<input checked="" type="checkbox"/>
Zero sequence source impedances as seen from the Point of Connection or node on the Single Line Diagram (as appropriate) consistent with the maximum infeed above:												
- Resistance	% on 100										<input type="checkbox"/>	<input checked="" type="checkbox"/>
- Reactance	% on 100										<input type="checkbox"/>	<input checked="" type="checkbox"/>
Positive sequence X/R ratio at instance of fault											<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pre-Fault voltage magnitude at which the maximum fault currents were calculated	p.u.										<input type="checkbox"/>	<input checked="" type="checkbox"/>

SCHEDULE 13 - FAULT INFEEED DATA
PAGE 2 OF 2

DATA DESCRIPTION	UNITS	F.Yr	F.Yr.	DATA to								
		0	1	2	3	4	5	6	7	RTL		
SHORT CIRCUIT INFEEED TO THE NATIONAL ELECTRICITY TRANSMISSION SYSTEM FROM USERS SYSTEM AT A CONNECTION POINT											CUSC Contract	CUSC App. Form
Negative sequence impedances of User's System as seen from the Point of Connection or node on the Single Line Diagram (as appropriate). If no data is given, it will be assumed that they are equal to the positive sequence values.												
- Resistance	% on 100										<input type="checkbox"/>	<input checked="" type="checkbox"/>
- Reactance	% on 100										<input type="checkbox"/>	<input checked="" type="checkbox"/>

SCHEDULE 14 - FAULT INFEED DATA (GENERATORS INCLUDING UNIT TRANSFORMERS AND STATION TRANSFORMERS)

PAGE 1 OF 5

The data in this Schedule 14 is all **Standard Planning Data**, and is to be provided by **Generators**, with respect to all directly connected **Power Stations**, all **Embedded Large Power Stations** and all **Embedded Medium Power Stations** connected to the **Subtransmission System**. A data submission is to be made each year in Week 24.

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Fault infeeds via Unit Transformers

A submission should be made for each **Generating Unit** (including those which are part of a **Synchronous Power Generating Module**) with an associated **Unit Transformer**. Where there is more than one **Unit Transformer** associated with a **Generating Unit**, a value for the total infeed through all **Unit Transformers** should be provided. The infeed through the **Unit Transformer(s)** should include contributions from all motors normally connected to the **Unit Board**, together with any generation (eg **Auxiliary Gas Turbines**) which would normally be connected to the **Unit Board**, and should be expressed as a fault current at the **Generating Unit** terminals for a fault at that location.

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DATA DESCRIPTION	UNITS	F.Yr.	DATA to									
		0	1	2	3	4	5	6	7	RTL		
(PC.A.2.5)											CUSC Contract	CUSC App. Form
Name of Power Station											<input type="checkbox"/>	<input checked="" type="checkbox"/>
Number of Unit Transformer											<input type="checkbox"/>	<input checked="" type="checkbox"/>
Symmetrical three phase short-circuit current infeed through the Unit Transformers(s) for a fault at the Generating Unit terminals												
- at instant of fault	kA										<input type="checkbox"/>	<input checked="" type="checkbox"/>
- after subtransient fault current contribution has substantially decayed	kA										<input type="checkbox"/>	<input checked="" type="checkbox"/>
Positive sequence X/R ratio at instance of fault											<input type="checkbox"/>	<input checked="" type="checkbox"/>
Subtransient time constant (if significantly different from 40ms)	ms										<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pre-fault voltage at fault point (if different from 1.0 p.u.)											<input type="checkbox"/>	<input checked="" type="checkbox"/>
The following data items need only be supplied if the Generating Unit Step-up Transformer can supply zero sequence current from the Generating Unit side to the National Electricity Transmission System												
Zero sequence source impedances as seen from the Generating Unit terminals consistent with the maximum infeed above:												
- Resistance	% on 100										<input type="checkbox"/>	<input checked="" type="checkbox"/>

SCHEDULE 14 - FAULT INFEEED DATA (GENERATORS INCLUDING UNIT TRANSFORMERS AND STATION TRANSFORMERS)

PAGE 2 OF 5

Fault infeeds via Station Transformers

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A submission is required for each **Station Transformer** directly connected to the **National Electricity Transmission System**. The submission should represent normal operating conditions when the maximum number of **Gensets** are **Synchronised** to the **System**, and should include the fault current from all motors normally connected to the **Station Board**, together with any Generation (eg **Auxiliary Gas Turbines**) which would normally be connected to the **Station Board**. The fault infeed should be expressed as a fault current at the hv terminals of the **Station Transformer** for a fault at that location.

If the submission for normal operating conditions does not represent the worst case, then a separate submission representing the maximum fault infeed that could occur in practice should be made.

DATA DESCRIPTION	UNITS	F.Yr. 0	F.Yr. 1	F.Yr. 2	F.Yr. 3	F.Yr. 4	F.Yr. 5	F.Yr. 6	F.Yr. 7	DATA to RTL	
(PC.A.2.5)										CUSC Contract	CUSC App. Form
Name of Power Station										<input type="checkbox"/>	<input checked="" type="checkbox"/>
Number of Station Transformer										<input type="checkbox"/>	<input checked="" type="checkbox"/>
Symmetrical three phase short-circuit current infeed for a fault at the Connection Point											
- at instant of fault	kA									<input type="checkbox"/>	<input checked="" type="checkbox"/>
- after subtransient fault current contribution has substantially decayed	kA									<input type="checkbox"/>	<input checked="" type="checkbox"/>
Positive sequence X/R ratio At instance of fault										<input type="checkbox"/>	<input checked="" type="checkbox"/>
Subtransient time constant (if significantly different from 40ms)	mS									<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pre-fault voltage (if different from 1.0 p.u.) at fault point (See note 1)										<input type="checkbox"/>	<input checked="" type="checkbox"/>
Zero sequence source Impedances as seen from the Point of Connection Consistent with the maximum Infeed above:											
- Resistance	% on 100									<input type="checkbox"/>	<input checked="" type="checkbox"/>
- Reactance	% on 100									<input type="checkbox"/>	<input checked="" type="checkbox"/>

Note 1. The pre-fault voltage provided above should represent the voltage within the range 0.95 to 1.05 that gives the highest fault current

Note 2. % on 100 is an abbreviation for % on 100 MVA

SCHEDULE 14 - FAULT INFEED DATA (GENERATORS INCLUDING UNIT TRANSFORMERS AND STATION TRANSFORMERS)

Fault infeeds from Power Park Modules

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A submission is required for the whole **Power Park Module** and for each **Power Park Unit** type or equivalent. The submission shall represent operating conditions that result in the maximum fault infeed. The fault current from all motors normally connected to the **Power Park Unit's** electrical system shall be included. The fault infeed shall be expressed as a fault current at the terminals of the **Power Park Unit**, or the **Common Collection Busbar** if an equivalent **Single Line Diagram** and associated data as described in PC.A.2.2.2 is provided, and the **Grid Entry Point**, or **User System Entry Point** if **Embedded**, for a fault at the **Grid Entry Point**, or **User System Entry Point** if **Embedded**.

Should actual data in respect of fault infeeds be unavailable at the time of the application for a **CUSC Contract** or **Embedded Development Agreement**, a limited subset of the data, representing the maximum fault infeed that may result from all of the plant types being considered, shall be submitted. This data will, as a minimum, represent the root mean square of the positive, negative and zero sequence components of the fault current for both single phase and three phase solid faults at the **Grid Entry Point** (or **User System Entry Point** if **Embedded**) at the time of fault application and 50ms following fault application. Actual data in respect of fault infeeds shall be submitted to **NGET** as soon as it is available, in line with PC.A.1.2

DATA DESCRIPTION	UNITS	F.Yr.	DATA to									
		<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	RTL		
(PC.A.2.5)										CUSC Contract	CUSC App. Form	
Name of Power Station											<input type="checkbox"/>	<input checked="" type="checkbox"/>
Name of Power Park Module											<input type="checkbox"/>	<input checked="" type="checkbox"/>
Power Park Unit type											<input type="checkbox"/>	<input checked="" type="checkbox"/>
A submission shall be provided for the contribution of the entire Power Park Module and each type of Power Park Unit or equivalent to the positive, negative and zero sequence components of the short circuit current at the Power Park Unit terminals, or Common Collection Busbar , and Grid Entry Point or User System Entry Point if Embedded for												
(i) a solid symmetrical three phase short circuit											<input type="checkbox"/>	<input checked="" type="checkbox"/>
(ii) a solid single phase to earth short circuit											<input type="checkbox"/>	<input checked="" type="checkbox"/>
(iii) a solid phase to phase short circuit											<input type="checkbox"/>	<input checked="" type="checkbox"/>
(iv) a solid two phase to earth short circuit											<input type="checkbox"/>	<input checked="" type="checkbox"/>
at the Grid Entry Point or User System Entry Point if Embedded .											<input type="checkbox"/>	<input checked="" type="checkbox"/>
If protective controls are used and active for the above conditions, a submission shall be provided in the limiting case where the protective control is not active. This case may require application of a non-solid fault, resulting in a retained voltage at the fault point.											<input type="checkbox"/>	<input checked="" type="checkbox"/>

SCHEDULE 14 - FAULT INFEEED DATA (GENERATORS INCLUDING UNIT TRANSFORMERS AND STATION TRANSFORMERS)

PAGE 4 OF 5

DATA DESCRIPTION	UNITS	F.Yr.	DATA to RTL	DATA DESCRIPTION								
		0	1	2	3	4	5	6	7			
										CUSC Contract	CUSC App. Form	
- A continuous time trace and table showing the root mean square of the positive, negative and zero sequence components of the fault current from the time of fault inception to 140ms after fault inception at 10ms intervals	Graphical and tabular kA versus s										□	■
- A continuous time trace and table showing the positive, negative and zero sequence components of retained voltage at the terminals or Common Collection Busbar , if appropriate	p.u. versus s										□	■
- A continuous time trace and table showing the root mean square of the positive, negative and zero sequence components of retained voltage at the fault point, if appropriate	p.u. versus s										□	■

SCHEDULE 14 - FAULT INFEEED DATA (GENERATORS INCLUDING UNIT TRANSFORMERS AND STATION TRANSFORMERS)
PAGE 5 OF 5

<u>DATA DESCRIPTION</u>	<u>UNITS</u>	<u>F.Yr.</u> <u>0</u>	<u>F.Yr.</u> <u>1</u>	<u>F.Yr.</u> <u>2</u>	<u>F.Yr.</u> <u>3</u>	<u>F.Yr.</u> <u>4</u>	<u>F.Yr.</u> <u>5</u>	<u>F.Yr.</u> <u>6</u>	<u>F.Yr.</u> <u>7</u>	<u>DATA to RTL</u>	<u>DATA DESCRIPTION</u>
										CUSC Contract	CUSC App. Form
For Power Park Units that utilise a protective control, such as a crowbar circuit,											
- additional rotor resistance applied to the Power Park Unit under a fault situation	% on MVA									<input type="checkbox"/>	<input checked="" type="checkbox"/>
- additional rotor reactance applied to the Power Park Unit under a fault situation.	% on MVA									<input type="checkbox"/>	<input checked="" type="checkbox"/>
Positive sequence X/R ratio of the equivalent at time of fault at the Common Collection Busbar										<input type="checkbox"/>	<input checked="" type="checkbox"/>
Minimum zero sequence impedance of the equivalent at a Common Collection Busbar										<input type="checkbox"/>	<input checked="" type="checkbox"/>
Active Power generated pre-fault	MW									<input type="checkbox"/>	<input checked="" type="checkbox"/>
Number of Power Park Units in equivalent generator										<input type="checkbox"/>	<input checked="" type="checkbox"/>
Power Factor (lead or lag)										<input type="checkbox"/>	<input checked="" type="checkbox"/>
Pre-fault voltage (if different from 1.0 p.u.) at fault point (See note 1)	p.u.									<input type="checkbox"/>	<input checked="" type="checkbox"/>
Items of reactive compensation switched in pre-fault										<input type="checkbox"/>	<input checked="" type="checkbox"/>

Note 1. The pre-fault voltage provided above should represent the voltage within the range 0.95 to 1.05 that gives the highest fault current

SCHEDULE 15 — MOTHBALLED POWER GENERATING MODULES, MOTHBALLED GENERATING UNIT, MOTHBALLED POWER PARK MODULE (INCLUDING DC CONNECTED POWER PARK MODULES), MOTHBALLED HVDC SYSTEMS, MOTHBALLED HVDC CONVERTERS, MOTHBALLED DC CONVERTERS AT A DC CONVERTER STATION AND ALTERNATIVE FUEL DATA

ALTERNATIVE FUEL INFORMATION

The following data items for alternative fuels need only be supplied with respect to each **Generating Unit** whose primary fuel is gas including those which form part of a **Power Generating Module**.

Power Station	Generating Unit Name (e.g. Unit 1)						
	DATA DESCRIPTION	UNITS	DATA CAT	GENERATING UNIT DATA			
				1	2	3	4
Alternative Fuel Type (*please specify)	Text	DPD II	Oil distillate	Other gas*	Other*	Other*	Other*
CHANGEOVER TO ALTERNATIVE FUEL							
For off-line changeover:							
Time to carry out off-line fuel changeover	Minutes	DPD II					
Maximum output following off-line changeover	MW	DPD II					
For on-line changeover:							
Time to carry out on-line fuel changeover	Minutes	DPD II					
Maximum output during on-line fuel changeover	MW	DPD II					
Maximum output following on-line changeover	MW	DPD II					
Maximum operating time at full load assuming:							
Typical stock levels	Hours	DPD II					
Maximum possible stock levels	Hours	DPD II					
Maximum rate of replacement of depleted stocks of alternative fuels on the basis of Good Industry Practice	MWh(electrical)/day	DPD II					
Is changeover to alternative fuel used in normal operating arrangements?	Text	DPD II					
Number of successful changeovers carried out in the last NGET Financial Year (** delete as appropriate)	Text	DPD II					

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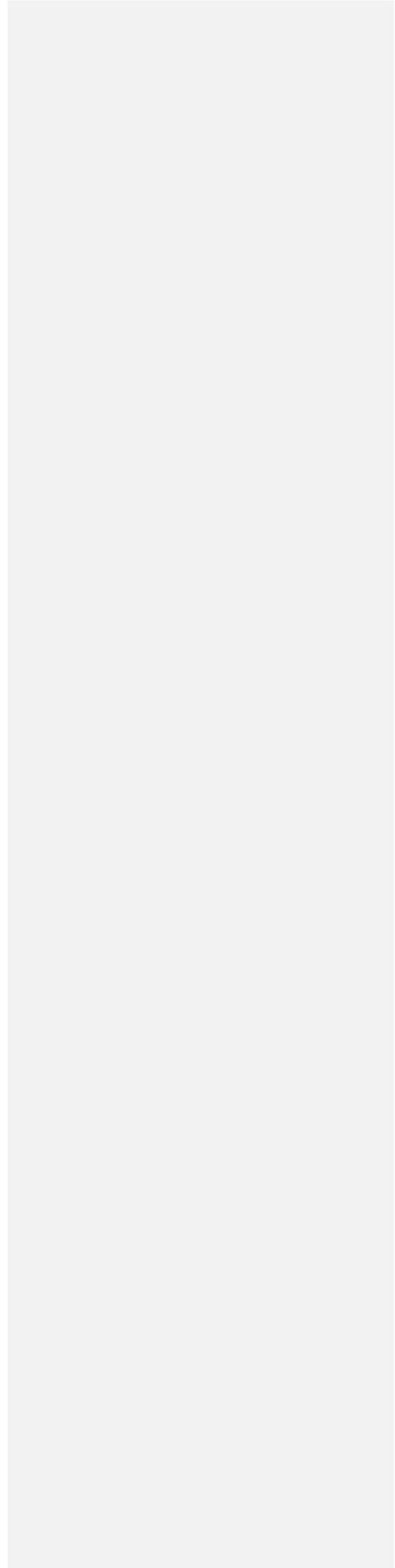
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SCHEDULE 15 – MOTHBALLED POWER GENERATING MODULES, MOTHBALLED GENERATING UNIT, MOTHBALLED POWER PARK MODULE, (INCLUDING MOTHBALLED DC CONNECTED POWER PARK MODULES), MOTHBALLED HVDC SYSTEMS, MOTHBALLED HVDC CONVERTERS MOTHBALLED DC CONVERTERS AT A DC CONVERTER STATION AND ALTERNATIVE FUEL DATA

DATA DESCRIPTION	UNITS	DATA CAT	GENERATING UNIT DATA			
			1	2	3	4
CHANGEOVER BACK TO MAIN FUEL For off-line changeover: Time to carry out off-line fuel changeover For on-line changeover: Time to carry out on-line fuel changeover Maximum output during on-line fuel changeover	Minutes Minutes MW					

Notes

1. Where a **Generating Unit** has the facilities installed to generate using more than one alternative fuel type details of each alternative fuel should be given.
2. Significant factors and their effects which may prevent the use of alternative fuels achieving the estimated values provided in this table (e.g. emissions limits, distilled water stocks etc.) should be appended separately.

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- No information collated under this Schedule will be transferred to the **Relevant Transmission Licensees**

SCHEDULE 16 - BLACK START INFORMATION
PAGE 1 OF 1

<p>BLACK START INFORMATION</p> <p>The following data/text items are required from each Generator for each BM Unit at a Large Power Station as detailed in PC.A.5.7. Data is not required for Generating Units that are contracted to provide Black Start Capability, Power Generating Modules, Power Park Modules or Generating Units that have an Intermittent Power Source. The data should be provided in accordance with PC-A.1.2 and also, where possible, upon request from NGET during a Black Start.</p>	<p>Units</p>	<p>Data Category</p>
<p>Data Description (PC.A.5.7) (■ CUSC Contract)</p>		
<p>Assuming all BM Units were running immediately prior to the Total Shutdown or Partial Shutdown and in the event of loss of all external power supplies, provide the following information:</p>		
<p>a) Expected time for the first and subsequent BM Units to be Synchronised, from the restoration of external power supplies, assuming external power supplies are not available for up to 24hrs</p>	<p>Tabular or Graphical</p>	<p>DPD II</p>
<p>b) Describe any likely issues that would have a significant impact on a BM Unit's time to be Synchronised arising as a direct consequence of the inherent design or operational practice of the Power Station and/or BM Unit, e.g. limited barring facilities, time from a Total Shutdown or Partial Shutdown at which batteries would be discharged.</p>	<p>Text</p>	<p>DPD II</p>
<p>Block Loading Capability:</p>		
<p>c) Provide estimated Block Loading Capability from 0MW to Registered Capacity of each BM Unit based on the unit being 'hot' (run prior to shutdown) and also 'cold' (not run for 48hrs or more prior to the shutdown). The Block Loading Capability should be valid for a frequency deviation of 49.5Hz – 50.5Hz. The data should identify any required 'hold' points.</p>	<p>Tabular or Graphical</p>	<p>DPD II</p>

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SCHEDULE 18 - OFFSHORE TRANSMISSION SYSTEM DATA
PAGE 1 OF 24

The data in this Schedule 18 is required from **Generators** who are undertaking **OTSDUW** and connecting to a **Transmission Interface Point**.

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DATA DESCRIPTION	UNITS	DATA to RTL		DATA CAT.	GENERATING UNIT OR STATION DATA						
		CUSC Cont ract	CUSC App. Form		F.Yr0	F.Yr1	F.Yr2	F.Yr3	F.Yr4	F.Yr5	F.Yr 6
INDIVIDUAL OTSDUW DATA											
Interface Point Capacity (PC.A.3.2.2 (a))	MW MVA _r	<input type="checkbox"/>	<input checked="" type="checkbox"/>								
Performance Chart at the Transmission Interface Point for OTSDUW Plant and Apparatus (PC.A.3.2.2(f)(iv))		<input type="checkbox"/>	<input checked="" type="checkbox"/>								
OTSDUW DEMANDS											
Demand associated with the OTSDUW Plant and Apparatus (excluding OTSDUW DC Converters – see Note 1) supplied at each Interface Point . The User should also provide the Demand supplied to each Connection Point on the OTSDUW Plant and Apparatus . (PC.A.5.2.5)											
- The maximum Demand that could occur.	MW MVA _r	<input type="checkbox"/>		DPD I							
- Demand at specified time of annual peak half hour of National Electricity Transmission System Demand at Annual ACS Conditions .	MW MVA _r	<input type="checkbox"/>		DPD I DPD II							
- Demand at specified time of annual minimum half-hour of National Electricity Transmission System Demand .	MW MVA _r	<input type="checkbox"/>		DPD II DPD II							
(Note 1 – Demand required from OTSDUW DC Converters should be supplied under page 2 of Schedule 18).											

SCHEDULE 18 - OFFSHORE TRANSMISSION SYSTEM DATA

PAGE 2 OF 24

OTSDUW USERS SYSTEM DATA

DATA DESCRIPTION	UNITS	DATA to RTL		DATA CATEGORY
		CUSC Contract	CUSC App. Form	
OFFSHORE TRANSMISSION SYSTEM LAYOUT (PC.A.2.2.1, PC.A.2.2.2 and P.C.A.2.2.3)				
A Single Line Diagram showing connectivity of all of the Offshore Transmission System including all Plant and Apparatus between the Interface Point and all Connection Points is required.		■	■	SPD
This Single Line Diagram shall depict the arrangement(s) of all of the existing and proposed load current carrying Apparatus relating to both existing and proposed Interface Points and Connection Points , showing electrical circuitry (ie. overhead lines, underground cables (including subsea cables), power transformers and similar equipment), operating voltages, circuit breakers and phasing arrangements		■	■	SPD
Operational Diagrams of all substations within the OTSDUW Plant and Apparatus		■	■	SPD
SUBSTATION INFRASTRUCTURE (PC.A.2.2.6)				
For the infrastructure associated with any OTSDUW Plant and Apparatus				
Rated 3-phase rms short-circuit withstand current	kA	■	■	SPD
Rated 1-phase rms short-circuit withstand current	kA	■	■	SPD
Rated Duration of short-circuit withstand	s	■	■	SPD
Rated rms continuous current	A	■	■	SPD
LUMPED SUSCEPTANCES (PC.A.2.3)				
Equivalent Lumped Susceptance required for all parts of the User's Subtransmission System (including OTSDUW Plant and Apparatus) which are not included in the Single Line Diagram.		■	■	
This should not include:		■	■	
(a) independently switched reactive compensation equipment identified above.		■	■	
(b) any susceptance of the OTSDUW Plant and Apparatus inherent in the Demand (Reactive Power) data provided on Page 1 and 2 of this Schedule 14.		■	■	
Equivalent lumped shunt susceptance at nominal Frequency .	% on 100 MVA	■	■	

SCHEDULE 18 - OFFSHORE TRANSMISSION SYSTEM DATA
PAGE 3 OF 24

OFFSHORE TRANSMISSION SYSTEM DATA
 Branch Data (PC.A.2.2.4)

Node 1	Node 2	Rated Voltage (kV)	Operating Voltage (kV)	Circuit	PPS PARAMETERS			ZPS PARAMETERS			Maximum Continuous Ratings			Length (km)
					R1 %100 MVA	X1 %100 MVA	B 1 %100 MVA	R0 %100 MVA	X0 %100M VA	B0 %100M VA	Winter (MVA)	Sping Autumn (MVA)	Summer (MVA)	

Notes

1. For information equivalent STC Reference: STCP12-1m Part 3 – 2.1 Branch Data
2. In the case where an overhead line exists within the OTSDUW Plant and Apparatus the Mutual inductances should also be provided.

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SCHEDULE 18 - OFFSHORE TRANSMISSION SYSTEM DATA

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OFFSHORE TRANSMISSION SYSTEM DATA

Circuit Breaker Data (PC.A.2.2.6(a))

The data below is all **Standard Planning Data**, and should be provided for all **OTSUA** switchgear (ie. circuit breakers, load disconnectors and disconnectors)

Location	Circuit Breaker Data						Assumed Operating Times			3 Phase				1 Phase				▲		
	Name	Rated Voltage	Operating Voltage	Make	Model	Type	Year Commissioned	Circuit Breaker (mS)	Minimum Protection & Trip Relay (mS)	Total Time (mS)	Continuous Rating (A)	Fault Rating (RMS Symmetrical) (3 phase) (kA) (MVA)	Fault Break Rating (Peak Asymmetrical) (3 phase) (kA)	Fault Make Rating (Peak Asymmetrical) (3 phase) (kA)	Fault Rating (RMS Symmetrical) (1 phase) (kA) (MVA)	Fault Break Rating (Peak Asymmetrical) (1 phase) (kA)	Fault Break Rating (Peak Asymmetrical) (1 phase) (kA)		Fault Make Rating (Peak Asymmetrical) (1 phase) (kA)	DC time constant at testing of asymmetrical breaking ability (s)

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SCHEDULE 18 - OFFSHORE TRANSMISSION SYSTEM DATA
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OFFSHORE TRANSMISSION SYSTEM DATA

REACTIVE COMPENSATION EQUIPMENT (PC.A.2.4(e))

Item	Node	kV	Device No.	Rating (MVar)	P Loss (kW)	Tap range	Connection Arrangement

Notes:

1. For information STC Reference: STCP12-1: Part 3 - 2.5 Reactive Compensation Equipment
2. Data relating to continuously variable reactive compensation equipment (such as statcoms or SVCs) should be entered on the SVC Modelling table.
3. For the avoidance of doubt this includes any AC Reactive Compensation equipment included within the OTSDUW DC Converter other than harmonic filter data which is to be entered in the harmonic filter data table.

PC.A.2.4.1(e)	A mathematical representation in block diagram format to model the control of any dynamic compensation plant. The model should be suitable for RMS dynamic stability type studies in which the time constants used should not be less than 10ms.
---------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

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SCHEDULE 18 - OFFSHORE TRANSMISSION SYSTEM DATA
PAGE 8 OF 24

OFFSHORE TRANSMISSION SYSTEM DATA
REACTIVE COMPENSATION - SVC Modelling Data (PC.A.2.4.1(e)(iii))

HV Node	LV Node	Control Node	Normal Voltage (kV)	Target Voltage (kV)	Max MVar at HV	Min MVar at HV	Slope %	Voltage Dependent Q Limit	Normal Running Mode	R1 PPS_R	X1 PPS_X	R0 ZPS_R	X0 ZPS_X	Transf. Winding Type	Connection (Direct/Tertiary)

Notes:

1. For information the equivalent SVC Reference is: STCP12-1: Part 3 - 2.7 SVC Modelling Data

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SCHEDULE 18 - OFFSHORE TRANSMISSION SYSTEM DATA

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Information for Transient Overvoltage Assessment (DPD I) (PC.A.6.2 ■ CUSC Contract)

The information listed below may be requested by **NGET** from each **User** undertaking **OTSDUW** with respect to any **Interface Point** or **Connection Point** to enable NGET to assess transient overvoltage on the **National Electricity Transmission System**.

- (a) Busbar layout plan(s), including dimensions and geometry showing positioning of any current and voltage transformers, through bushings, support insulators, disconnectors, circuit breakers, surge arresters, etc. Electrical parameters of any associated current and voltage transformers, stray capacitances of wall bushings and support insulators, and grading capacitances of circuit breakers;
- (b) Electrical parameters and physical construction details of lines and cables connected at that busbar. Electrical parameters of all plant e.g., transformers (including neutral earthing impedance or zig-zag transformers if any), series reactors and shunt compensation equipment connected at that busbar (or to the tertiary of a transformer) or by lines or cables to that busbar;
- (c) Basic insulation levels (BIL) of all **Apparatus** connected directly, by lines or by cables to the busbar;
- (d) Characteristics of overvoltage **Protection** devices at the busbar and at the termination points of all lines, and all cables connected to the busbar;
- (e) Fault levels at the lower voltage terminals of each transformer connected to each **Interface Point** or **Connection Point** without intermediate transformation;
- (f) The following data is required on all transformers within the **OTSDUW Plant and Apparatus**.
- (g) An indication of which items of equipment may be out of service simultaneously during **Planned Outage** conditions.

Harmonic Studies (DPD I) (PC.A.6.4 ■ CUSC Contract)

The information given below, both current and forecast, where not already supplied in this Schedule 14 may be requested by **NGET** from each **User** if it is necessary for **NGET** to evaluate the production/magnification of harmonic distortion on **National Electricity Transmission System**. The impact of any third party **Embedded** within the **User's System** should be reflected:-

- (a) Overhead lines and underground cable circuits (including subsea cables) of the **User's OTSDUW Plant and Apparatus** must be differentiated and the following data provided separately for each type:-

Positive phase sequence resistance
Positive phase sequence reactance
Positive phase sequence susceptance

- (b) for all transformers connecting the **OTSDUW Plant and Apparatus** to a lower voltage:-

Rated MVA
Voltage Ratio
Positive phase sequence resistance
Positive phase sequence reactance

SCHEDULE 18 - OFFSHORE TRANSMISSION SYSTEM DATA

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- (c) at the lower voltage points of those connecting transformers:-

Equivalent positive phase sequence susceptance
Connection voltage and MVAR rating of any capacitor bank and component design parameters if configured as a filter

Equivalent positive phase sequence interconnection impedance with other lower voltage points
The minimum and maximum **Demand** (both MW and MVAR) that could occur
Harmonic current injection sources in Amps at the Connection Points and Interface Points

- (d) an indication of which items of equipment may be out of service simultaneously during **Planned Outage** conditions

Voltage Assessment Studies (DPD I) (PC.A.6.5 ■ CUSC Contract)

The information listed below, where not already supplied in this Schedule 14, may be requested by **NGET** from each **User** undertaking **OTSDUW** with respect to any **Connection Point** or **Interface Point** if it is necessary for **NGET** to undertake detailed voltage assessment studies (eg to examine potential voltage instability, voltage control co-ordination or to calculate voltage step changes on the **National Electricity Transmission System**).

- (a) For all circuits of the **User's OTSDUW Plant and Apparatus**:-

Positive Phase Sequence Reactance
Positive Phase Sequence Resistance
Positive Phase Sequence Susceptance
MVAR rating of any reactive compensation equipment

- (b) for all transformers connecting the **User's OTSDUW Plant and Apparatus** to a lower voltage:-

Rated MVA
Voltage Ratio
Positive phase sequence resistance
Positive Phase sequence reactance
Tap-changer range
Number of tap steps
Tap-changer type: on-load or off-circuit
AVC/tap-changer time delay to first tap movement
AVC/tap-changer inter-tap time delay

- (c) at the lower voltage points of those connecting transformers

Equivalent positive phase sequence susceptance
MVAR rating of any reactive compensation equipment
Equivalent positive phase sequence interconnection impedance with other lower voltage points
The maximum **Demand** (both MW and MVAR) that could occur
Estimate of voltage insensitive (constant power) load content in % of total load at both winter peak and 75% off-peak load conditions

SCHEDULE 18 - OFFSHORE TRANSMISSION SYSTEM DATA

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Short Circuit Analyses:(DPD I) (PC.A.6.6 ■ CUSC Contract)

The information listed below, both current and forecast, and where not already supplied under this Schedule 14, may be requested by **NGET** from each **User** undertaking **OTSDUW** with respect to any **Connection Point or Interface Point** where prospective short-circuit currents on equipment owned by a **Transmission Licensee** or operated or managed by **NGET** are close to the equipment rating.

(a) For all circuits of the **User's OTSDUW Plant and Apparatus:-**

- Positive phase sequence resistance
- Positive phase sequence reactance
- Positive phase sequence susceptance
- Zero phase sequence resistance (both self and mutuals)
- Zero phase sequence reactance (both self and mutuals)
- Zero phase sequence susceptance (both self and mutuals)

(b) for all transformers connecting the **User's OTSDUW Plant and Apparatus** to a lower voltage:-

- Rated MVA
- Voltage Ratio
- Positive phase sequence resistance (at max, min and nominal tap)
- Positive Phase sequence reactance (at max, min and nominal tap)
- Zero phase sequence reactance (at nominal tap)
- Tap changer range
- Earthing method: direct, resistance or reactance
- Impedance if not directly earthed

(c) at the lower voltage points of those connecting transformers:-

The maximum **Demand** (in MW and MVA_r) that could occur Short-circuit infeed data in accordance with PC.A.2.5.6(a) unless the **User's OTSDUW Plant and Apparatus** runs in parallel with the **Subtransmission System**, when to prevent double counting in each node infeed data, a π equivalent comprising the data items of PC.A.2.5.6(a) for each node together with the positive phase sequence interconnection impedance between the nodes shall be submitted.

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SCHEDULE 18 - OFFSHORE TRANSMISSION SYSTEM DATA
PAGE 14 OF 24

DATA DESCRIPTION	UNITS	<u>F.</u>	DATA to										
		Yr.	Yr.	Yr.	Yr.	Yr.	Yr.	Yr.	Yr.	Yr.	<u>Yr.</u>	RTL	
		<u>0</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>			CUSC Contract	CUSC App. Form
- A continuous time trace and table showing the root mean square of the positive, negative and zero sequence components of the fault current from the time of fault inception to 140ms after fault inception at 10ms intervals	Graphical and tabular kA versus s											□	■
- A continuous time trace and table showing the positive, negative and zero sequence components of retained voltage at the Interface Point and each Connection Point , if appropriate	p.u. versus s											□	■
- A continuous time trace and table showing the root mean square of the positive, negative and zero sequence components of retained voltage at the fault point, if appropriate	p.u. versus s											□	■
Positive sequence X/R ratio of the equivalent at time of fault at the Interface Point and each Connection Point												□	■
Minimum zero sequence impedance of the equivalent at the Interface Point and each Connection Point												□	■
Active Power transfer at the Interface Point and each Connection Point pre-fault	MW											□	■
Power Factor (lead or lag)												□	■
Pre-fault voltage (if different from 1.0 p.u.) at fault point (See note 1)	p.u.											□	■
Items of reactive compensation switched in pre-fault												□	■

Note 1. The pre-fault voltage provided above should represent the voltage within the range 0.95 to 1.05 that gives the highest fault current

SCHEDULE 18 - OFFSHORE TRANSMISSION SYSTEM DATA
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Thermal Ratings Data (PC.A.2.2.4)

		CIRCUIT RATING SCHEDULE		
Voltage 132kV		Offshore TO Name		Issue Date
CIRCUIT Name from Site A – Site B				

OVERALL CCT RATINGS	Winter				Spring/Autumn				Summer				
	%Nom	Limit	Amps	MVA	%Nom	Limit	Amps	MVA	%Nom	Limit	Amps	MVA	
Pre-Fault Continuous	84%	Line	485	111	84%	Line	450	103	84%	Line	390	89	
Post-Fault Continuous	100%	Line	580	132	100%	Line	540	123	100%	Line	465	106	
Prefault load exceeds line prefault continuous rating	6hr	95%	Line	580	132	95%	Line	540	123	95%	Line	465	106
	20m		Line	580	132		Line	540	123		Line	465	106
	10m	mva	Line	580	132	mva	Line	540	123	mva	Line	465	106
	5m	125	Line	580	132	116	Line	540	123	100	Line	465	106
	3m		Line	580	132		Line	540	123		Line	465	106
Short Term Overloads	6hr	90%	Line	580	132	90%	Line	540	123	90%	Line	465	106
	20m		Line	580	132		Line	540	123		Line	465	106
	10m	mva	Line	580	132	mva	Line	540	123	mva	Line	465	106
	5m	118	Line	580	132	110	Line	540	123	95	Line	465	106
	3m		Line	580	132		Line	540	123		Line	465	106
Limiting Item and permitted overload values for different times and pre-fault loads	6hr	84%	Line	580	132	84%	Line	540	123	84%	Line	465	106
	20m		Line	590	135		Line	545	125		Line	470	108
	10m	mva	Line	630	144	mva	Line	580	133	mva	Line	495	113
	5m	110	Line	710	163	103	Line	655	149	89	Line	555	126
	3m		Line	810	185		Line	740	170		Line	625	143
	6hr	75%	Line	580	132	75%	Line	540	123	75%	Line	465	106
	20m		Line	595	136		Line	555	126		Line	475	109
	10m	mva	Line	650	149	mva	Line	600	137	mva	Line	510	116
	5m	99	Line	760	173	92	Line	695	159	79	Line	585	134
	3m		Line	885	203		Line	810	185		Line	685	156
6hr	60%	Line	580	132	60%	Line	540	123	60%	Line	465	106	
	20m		Line	605	138		Line	560	128		Line	480	110
	10m	mva	Line	675	155	mva	Line	620	142	mva	Line	530	121
	5m	79	Line	820	187	73	Line	750	172	63	Line	635	145
	3m		Line	985	226		Line	900	206		Line	755	173
6hr	30%	Line	580	132	30%	Line	540	123	30%	Line	465	106	
	20m		Line	615	141		Line	570	130		Line	490	112
	10m	mva	Line	710	163	mva	Line	655	150	mva	Line	555	127
	5m	39	Line	895	205	36	Line	820	187	31	Line	690	158
	3m		Line	1110	255		Line	1010	230		Line	845	193

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SCHEDULE 18 - OFFSHORE TRANSMISSION SYSTEM DATA
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▲ 6hr																				
▲ 20m																				
▲ 10m																				
▲ 5m																				
▲ 3m																				
▲ 6hr																				
▲ 20m																				
▲ 10m																				
▲ 5m																				
▲ 3m																				
▲ Notes or Restrictions Detailed																				

Notes: 1. For information the equivalent STC Reference: STCP12-1: Part 3 - 2.6 Thermal Ratings
 2. The values shown in the above table is example data.

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SCHEDULE 18 - OFFSHORE TRANSMISSION SYSTEM DATA
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Protection Policy (PC.A.6.3)

To include details of the protection policy

Protection Schedules(PC.A.6.3)

Data schedules for the protection systems associated with each primary plant item including:

Protection, Intertrip Signalling & operating times
Intertripping and protection unstabilisation initiation
Synchronising facilities
Delayed Auto Reclose sequence schedules

Automatic Switching Scheme Schedules (PC.A.2.2.7)

A diagram of the scheme and an explanation of how the system will operate and what plant will be affected by the scheme's operation.

SCHEDULE 18 - OFFSHORE TRANSMISSION SYSTEM DATA
PAGE 18 OF 24

GENERATOR INTERTRIP SCHEMES (PC.A.2.2.7(b))

Substation: _____

Details of Generator Intertrip Schemes:

A diagram of the scheme and an explanation of how the system will operate and what plant will be effected by the schemes operation.

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DEMAND INTERTRIP SCHEMES (PC.A.2.2.7(b))

Substation: _____

Details of Demand Intertrip Schemes:

A diagram of the scheme and an explanation of how the system will operate and what plant will be effected by the schemes operation

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SCHEDULE 18 - OFFSHORE TRANSMISSION SYSTEM DATA
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Specific Operating Requirements (CC.5.2.1)

SUBSTATION OPERATIONAL GUIDE

Substation: _____

Location Details:

Postal Address:	Telephone Nos.	Map Ref.
National Grid Interface		
Generator Interface		

- 1. Substation Type:**

- 2. Voltage Control:** *(short description of voltage control system. To include mention of modes ie Voltage, manual etc. Plus control step increments ie 0.5%-0.33kV?)*

- 3. Energisation Switching Information:** *(The standard energisation switching process from dead.)*

- 4. Intertrip Systems:**

- 5. Reactive Plant Outage:** *(A short explanation of any system re-configurations required to facilitate the outage of any reactive plant which form part of the OTSDUW Plant and Apparatus equipment. Also any generation restrictions required).*

- 6. Harmonic Filter Outage:** *(An explanation as to any OTSDUW Plant and Apparatus reconfigurations required to facilitate the outage and maintain the system within specified Harmonic limits, also any generation restrictions required).*

SCHEDULE 18 - OFFSHORE TRANSMISSION SYSTEM DATA
PAGE 20 OF 24

OTSDUW DC CONVERTER TECHNICAL DATA

OTSDUW DC CONVERTER NAME _____

DATE: _____

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Data Description	Units	DATA to RTL		Data Category	DC Converter Station Data
<i>(PC.A.4 and PC.A.5.2.5)</i>		CUSC Contract	CUSC App. Form		
<p>OTSDUW DC CONVERTER (CONVERTER DEMANDS):</p> <p>Demand supplied through Station Transformers associated with the OTSDUW DC Converter at each Interface Point and each Offshore Connection Point Grid Entry Point [PC.A.4.1]</p> <p>- Demand with all OTSDUW DC Converters operating at Interface Point Capacity .</p> <p>- Demand with all OTSDUW DC Converters operating at maximum Interface Point flow from the Interface Point to each Offshore Grid Entry Point .</p> <p>- The maximum Demand that could occur.</p> <p>- Demand at specified time of annual peak half hour of NGET Demand at Annual ACS Conditions.</p> <p>- Demand at specified time of annual minimum half-hour of NGET Demand.</p>	<p>MW MVA_r</p> <p>MW MVA_r</p> <p>MW MVA_r</p> <p>MW MVA_r</p> <p>MW MVA_r</p>	<p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p>	<p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p>	<p>DPD II DPD II</p> <p>DPD II DPD II</p> <p>DPD II DPD II</p> <p>DPD II DPD II</p> <p>DPD II</p>	
OTSDUW DC CONVERTER DATA	Text	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+	
Number of poles, i.e. number of OTSDUW DC Converters	Text	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+	
Pole arrangement (e.g. monopole or bipole)	Diagram	<input type="checkbox"/>			
Return path arrangement					
Details of each viable operating configuration					
Configuration 1	Diagram	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+	
Configuration 2	Diagram	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Configuration 3	Diagram	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Configuration 4	Diagram	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Configuration 5	Diagram	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
Configuration 6	Diagram	<input type="checkbox"/>	<input checked="" type="checkbox"/>		

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SCHEDULE 18 - OFFSHORE TRANSMISSION SYSTEM DATA
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Data Description	Units	DATA to RTL		Data Category	Operating Configuration					
		CUSC Contract	CUSC App. Form		1	2	3	4	5	6
OTSDUW DC CONVERTER DATA (PC.A.3.3.1(d))										
OTSDUW DC Converter Type (e.g. current or Voltage source)	Text	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD						
If the busbars at the Interface Point or Connection Point are normally run in separate sections identify the section to which the OTSDUW DC Converter configuration is connected	Section Number	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD						
	MW	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+						
Rated MW import per pole (PC.A.3.3.1)	MW	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+						
Rated MW export per pole (PC.A.3.3.1)	MW	<input type="checkbox"/>	<input checked="" type="checkbox"/>	SPD+						
ACTIVE POWER TRANSFER CAPABILITY (PC.A.3.2.2)										
Interface Point Capacity	MW MVA	<input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>	SPD SPD						
OTSDUW DC CONVERTER TRANSFORMER (PC.A.5.4.3.1)										
Rated MVA	MVA	<input type="checkbox"/>		DPD II						
Winding arrangement		<input type="checkbox"/>		DPD II						
Nominal primary voltage	kV	<input type="checkbox"/>		DPD II						
Nominal secondary (converter-side) voltage(s)	kV	<input type="checkbox"/>		DPD II						
Positive sequence reactance		<input type="checkbox"/>								
Maximum tap	% on	<input type="checkbox"/>		DPD II						
Nominal tap	MVA	<input type="checkbox"/>		DPD II						
Minimum tap	% on	<input type="checkbox"/>		DPD II						
Positive sequence resistance	MVA	<input type="checkbox"/>		DPD II						
Maximum tap	% on	<input type="checkbox"/>		DPD II						
Nominal tap	MVA	<input type="checkbox"/>		DPD II						
Minimum tap	% on	<input type="checkbox"/>		DPD II						
Zero phase sequence reactance	% on	<input type="checkbox"/>		DPD II						
Tap change range	MVA	<input type="checkbox"/>		DPD II						
Number of steps	% on	<input type="checkbox"/>		DPD II						
	MVA			DPD II						
	% on									
	MVA									
	% on									
	MVA									
	% on									
	MVA									
	% on									
	MVA									
	+% / -%									

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SCHEDULE 18 - OFFSHORE TRANSMISSION SYSTEM DATA
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Data Description	Units	DATA to RTL		Data Category	Operating configuration					
		CUSC Contract	CUSC App. Form		1	2	3	4	5	6
OTSDUW DC CONVERTER NETWORK DATA (PC.A.5.4.3.1 (c)) Rated DC voltage per pole Rated DC current per pole Details of the OTSDUW DC Network described in diagram form including resistance, inductance and capacitance of all DC cables and/or DC lines. Details of any line reactors (including line reactor resistance), line capacitors, DC filters, earthing electrodes and other conductors that form part of the OTSDUW DC Network should be shown.	kV A Diagram	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		DPD II DPD II DPD II						

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SCHEDULE 18 - OFFSHORE TRANSMISSION SYSTEM DATA
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Data Description	Units	DATA to		Data Category	Operating configuration					
		CUSC Contract	RTL CUSC App. Form		1	2	3	4	5	6
OTSDUW DC CONVERTER CONTROL SYSTEMS (PC.A.5.4.3.2)										
<p>Static $V_{DC} - P_{DC}$ (DC voltage – DC power) or Static $V_{DC} - I_{DC}$ (DC voltage – DC current) characteristic (as appropriate) when operating as –Rectifier –Inverter</p> <p>Details of rectifier mode control system, in block diagram form together with parameters showing transfer functions of individual elements.</p> <p>Details of inverter mode control system, in block diagram form showing transfer functions of individual elements including parameters (as applicable).</p> <p>Details of OTSDUW DC Converter transformer tap changer control system in block diagram form showing transfer functions of individual elements including parameters.</p> <p>Details of AC filter control systems in block diagram form showing transfer functions of individual elements including parameters</p> <p>Details of any frequency and/or load control systems in block diagram form showing transfer functions of individual elements including parameters.</p> <p>Details of any large or small signal modulating controls, such as power oscillation damping controls or sub-synchronous oscillation damping controls, that have not been submitted as part of the above control system data.</p> <p>Transfer block diagram representation of the reactive power control at converter ends for a voltage source converter.</p>	Diagram	<input type="checkbox"/>		DPD II						
	Diagram	<input type="checkbox"/>		DPD II						
	Diagram	<input type="checkbox"/>		DPD II						
	Diagram	<input type="checkbox"/>		DPD II						
	Diagram	<input type="checkbox"/>		DPD II						
	Diagram	<input type="checkbox"/>		DPD II						
	Diagram	<input type="checkbox"/>		DPD II						
	Diagram	<input type="checkbox"/>		DPD II						
	Diagram	<input type="checkbox"/>		DPD II						
	Diagram	<input type="checkbox"/>		DPD II						

SCHEDULE 18 - OFFSHORE TRANSMISSION SYSTEM DATA
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Data Description	Units	DATA to		Data Category	Operating configuration					
		CUSC Contract	CUSC App. Form		RTL	1	2	3	4	5
LOADING PARAMETERS (PC.A.5.4.3.3)										
MW Export from the Offshore Grid Entry Point to the Transmission Interface Point Nominal loading rate Maximum (emergency) loading rate	MW/s MW/s			DPD I DPD I						
Maximum recovery time, to 90% of pre-fault loading, following an AC system fault or severe voltage depression.	s	□		DPD II						
Maximum recovery time, to 90% of pre-fault loading, following a transient DC Network fault.	s	□		DPD II						

SCHEDULE 19 – USER DATA FILE STRUCTURE
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The structure of the **User Data File Structure** is given below.

i.d.	Folder name	Description of contents
Part A: Commercial & Legal		
A2	Commissioning	Commissioning & Test Programmes
A3	Statements	Statements of Readiness
A9	AS Monitoring	Ancillary Services Monitoring
A10	Self Certification	User Self Certification of Compliance
A11	Compliance statements	Compliance Statement
Part 1: Safety & System Operation		
1.1	Interface Agreements	Interface Agreements
1.2	Safety Rules	Safety Rules
1.3	Switching Procedures	Local Switching Procedures
1.4	Earthing	Earthing
1.5	SRS	Site Responsibility Schedules
1.6	Diagrams	Operational and Gas Zone Diagrams
1.7	Drawings	Site Common Drawings
1.8	Telephony	Control Telephony
1.9	Safety Procedures	Local Safety Procedures
1.10	Co-ordinators	Safety Co-ordinators
1.11	RISSP	Record of Inter System Safety Precautions
1.12	Tel Numbers	Telephone Numbers for Joint System Incidents
1.13	Contact Details	Contact Details (fax, tel, email)
1.14	Restoration Plan	Local Joint Restoration Plan (incl. black start if applicable)
1.15	Maintenance	Maintenance Standards
Part 2: Connection Technical Data		
2.1	DRC Schedule 5	DRC Schedule 5 – Users System Data
2.2	Protection Report	Protection Settings Reports
2.3	Special Automatic Facilities	Special Automatic Facilities e.g. intertrip
2.4	Operational Metering	Operational Metering
2.5	Tariff Metering	Tariff Metering
2.6	Operational Comms	Operational Communications
2.7	Monitoring	Performance Monitoring
2.8	Power Quality	Power Quality Test Results (if required)

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SCHEDULE 19 – USER DATA FILE STRUCTURE
PAGE 2 OF 2

Part 3: Generator Technical Data		
3.1	DRC Schedule 1	DRC Schedule 1 - Generating Unit, <u>Power Generating Module, HVDC System and DC Converter Technical Data</u>
3.2	DRC Schedule 2	DRC Schedule 2 - Generation Planning Data
3.3	DRC Schedule 4	DRC Schedule 4 – Frequency Droop & Response
3.4	DRC Schedule 14	DRC Schedule 14 – Fault Infeed Data – Generators
3.5	Special Generator Protection	Special Generator Protection eg Pole slipping; islanding
3.6	Compliance Tests	Compliance Tests & Evidence
3.7	Compliance Studies	Compliance Simulation Studies
3.8	Site Specific	Bilateral Connections Agreement Technical Data & Compliance
Part 4: General DRC Schedules		
4.1	DRC Schedule 3	DRC Schedule 3 – Large Power Station Outage Information
4.2	DRC Schedule 6	DRC Schedule 6 – Users Outage Information
4.3	DRC Schedule 7	DRC Schedule 7 – Load Characteristics
4.4	DRC Schedule 8	DRC Schedule 8 – BM Unit Data (if applicable)
4.5	DRC Schedule 10	DRC Schedule 10 –Demand Profiles
4.6	DRC Schedule 11	DRC Schedule 11 – Connection Point Data
Part 5: OTSDUW Data And Information (if applicable and prior to OTSUA Transfer Time)		
▲		<u>Diagrams</u>
▲		Circuits Plant and Apparatus
▲		Circuit Parameters
▲		Protection Operation and Autoswitching
▲		Automatic Control Systems
▲		Mathematical model of dynamic compensation plant

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