

SONI Limited
Demand Side Units
Grid Code Amendments Consultation Paper
1st November 2011

APPENDIX: Proposed Grid Code Modifications

It is proposed to amend the Grid Code by adding in the text in red and by deleting the text in blue strikethrough.

INTRODUCTION

4. The **Operating** procedures and principles governing the TSO's relationship with all Users under the **Grid Code**, be they the **DNO, Generators, Suppliers, Interconnector Users, Interconnector Owners, Generator Aggregators, Demand Side Units, Aggregators, Dispatchable Demand Customers** or **Large Demand Customers** are set out in the **Grid Code**. The **Grid Code** specifies day-to-day procedures for both planning and operational purposes and covers both normal and exceptional circumstances.

GLOSSARY AND DEFINITIONS

Aggregated Demand Site A group of **Individual Demand Sites** connected to the **Transmission** or **Distribution System** and represented by a **Dispatchable Demand Customer**, which together are capable of a **Demand Side Unit MW Capacity** equal to or above 4 MW (and which is therefore subject to **Central Dispatch** from the TSO). Each **Individual Demand Site** comprising an **Aggregated Demand Site** shall be in one currency zone and shall have a **Demand Side Unit MW Capacity** of no greater than 10 MW. Unless otherwise specified, information submitted in respect of an **Aggregated Demand Site** shall always be at an aggregated level.

Availability In respect of any period (and, in the case of a **PPA CDGU**, in relation to a **Designated Fuel** and, in the case of a **CDGU** other than

a **PPA CDGU**, in relation to a fuel), shall mean:

- (a) for any **CDGU**, **Controllable WFPS** or **Dispatchable WFPS** the figure (expressed in **MW** as at the **Connection Point** and at the direct connection with the **Distribution System**) stated in accordance with SDC1.4.1.1(a) to be the capability of the **CDGU**, **Controllable WFPS** or **Dispatchable WFPS** to generate electricity during that period. In relation to all **CDGUs** including an **Open Cycle Gas Turbine CDGU** and/or a **CCGT Installation**, the **Availability** declared by a **Generator** shall correspond to the maximum generation of electricity which that **Generator's CDGU** can achieve during that period. In relation to all **CDGUs**, the **Availability** declared by a **Generator** shall correspond to the level of generation of electricity up to and including the **Contracted Capacity** (for **PPA CDGUs** other than **PPA Open Cycle Gas Turbines**) or **Contracted Capacity (Peak)** (for **PPA Open Cycle Gas Turbines**) or **Registered Capacity** (for non-**PPA** plant) which that **CDGU** can achieve during that period;

- (b) for **Demand Side Units**, the **Demand Side Unit MW Capacity** (expressed in **MW** as at the **Connection Point** and at the direct connection with the **Distribution System**) stated in accordance with SDC1.4.1.1(a) to be the capability of the **Demand Side Unit** to reduce **Demand** during that period;

- (c) for **Aggregated Generating Units**, the aggregated figures (expressed in **MW** as at the **Connection Points** of each

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individual **Aggregated Generating Unit**) stated in accordance with SDC1.4.1.1(a) to be the capability of the **Aggregated Generating Units** as a whole to generate electricity during that period;

(d) for an **Interconnector**, the figure (expressed in **MW** at Auchencrosh) stated in accordance with SDC1.4.1.1(a) to be the capability of the **Interconnector** to export or import electricity.

"**Available**" shall be construed accordingly.

Demand Side Unit Energy Profile The estimated total **Energy** requirement for an **Individual Demand Site** or aggregated for each **Individual Demand Site** which form part of an **Aggregated Demand Site** for each **Trading Period** in the following **Optimisation Time Horizon** period and which must be submitted to the **TSO** in the **Availability Notice** under SDC 1.4.1.2.

Demand Side Unit Import Capacity The import value (in **MW**, **MVA**, **kW** and/or **kVA**) nominated by the **Dispatchable Demand Customer** for each **Individual Demand Site** within the Demand Side Unit.

Demand Side Unit MW Capacity The maximum change in **Active Power** that can be achieved by a **Demand Side Unit** by totalling the potential increase in on-site **Active Power Generation** and the potential decrease in on-site **Active Power Demand** at each **Individual Demand Site**.

Demand Side Unit MW Availability The forecasted change in **Active Power** which can be achieved in one currency zone by a **Demand Side Unit** for each **Trading Period** in the following **Optimisation Time Horizon** period and which must be submitted by the **User** to the **TSO** in an **Availability**

Notice under SDC1.4.1.2.

Demand Side Unit	An Individual Demand Site or Aggregated Demand Site with a Demand Side Unit MW Capacity of at least 4 MW. The Demand Side Unit shall be subject to Central Dispatch .
Demand Side Unit Export Capacity	The export value (in MW, MVA) nominated by the Dispatchable Demand Customer for each Individual Demand Site within the Demand Side Unit.
Demand Side Unit MW Response	The proportion (in MW) of the Demand Side Unit MW Capacity that is delivered at a given time following a dispatch instruction from the TSO . This value will be zero unless dispatched by the TSO .
Dispatchable Demand Customer	A person who operates a Demand Side Unit , with a Demand Side Unit MW Capacity not less than 4 MW.
Individual Demand Site	A single premises of a Customer connected to the Transmission System or Distribution System with a Demand Side Unit MW Capacity . The Individual Demand Site can have a Demand Side Unit Export Capacity and a Demand Side Unit Import Capacity .
Initial Demand Side Unit Response	The Demand Side Unit MW Response following a Dispatch Instruction from the TSO when the Demand Side Unit MW Response is at 0 MW for a period greater than 24 hours.
Initial Demand Side Unit Response Time	The time as specified by the Dispatchable Demand Customer in the Technical Parameters and is the time it takes for the Dispatchable Demand Customer to be able to implement the Initial Demand Side Unit Response from receipt of the Dispatch Instruction from the TSO .
Maximum Down Time	The maximum period of time during which Demand Side Unit MW Response at a Demand Side Unit can be greater than zero .

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Minimum Down Time The minimum period of time during which **Demand Side Unit MW Response** at a **Demand Side Unit** can be greater than zero

Outage In relation to a **Generating Unit**, a total or partial reduction in **Availability** in connection with the repair or maintenance of the **Generating Unit** or any associated **Power Station Equipment**, or resulting from a breakdown or failure of the **Generating Unit** or any associated **Power Station Equipment**. In relation to a **Demand Side Unit** or a **Large Demand Customer's** site, a total or partial change in **Demand Side Unit MW Capacity** in connection with the repair or maintenance of the **Demand Side Unit** or **Large Demand Customer's** unit or any associated equipment or resulting from a breakdown or failure of the **Demand Side Unit** or **Large Demand Customer's** site or any associated equipment. In relation to the **TSO**, the removal for repair or maintenance, or as a result of failure or breakdown, of any part of the **Transmission System**. In relation to the **DNO**, the construction, the removal for repair or maintenance or as a result of failure or breakdown, of any part of the distribution lines at 33kV on the **Distribution System**.

PLANNING CODE

PC.A2.3.3 Generating Unit Data Requirements

In relation to **Generating Units** other than the wind turbines comprised within a **WFPS**:

- (a) Prime mover type;
- (b) **Generating Unit** type;
- (c) **Generating Unit** rating and terminal voltage (MVA & kV);
- (d) **Generating Unit** rated power factor;
- (e) **Registered Capacity** sent out (MW);

- (f) **Maximum Generation** and **Minimum Generation** capability sent out (**MW** sent out);
- (g) **Reactive Power** capability (both leading and lagging) at the lower voltage terminals of the **Generator Transformers** for **Maximum Generation**, normal full **Load** and normal minimum **Load**;
- (h) Maximum auxiliary **Demand** in **MW** and **MVA**r;
- (i) Inertia constant (**MW sec/MVA**);
- (j) Short circuit ratio;
- (k) Direct axis transient reactance;
- (l) Direct axis sub-transient time constant;
- (m) **Generator Transformer** rated **MVA**, positive sequence reactance, and tap change range;
- (n) **Sustained Load Diagram**; and
- (o) a list of the **CCGT Modules** in the **CCGT Installation**, identifying each **CCGT Module**, and the **CCGT Installation** of which it forms part unambiguously, together with any other information which may be relevant in relation to the **CCGT Modules** and **CCGT Installations** and their operation.

In relation to the wind turbines comprised within a **WFPS**, such data equivalent to that listed in PC.A2.3.3(a) to PC.A2.3.3(n) as the **TSO** shall reasonably require.

PC.B2.2.2 **Generating Unit Data Requirements**

In relation to **Generating Units** other than the wind turbines comprised within a **WFPS**:

- (a) Prime mover type;
- (b) **Generating Unit** type;
- (c) **Generating Unit** rating and terminal voltage (**MVA** & **kV**);
- (d) **Generating Unit** rated power factor;
- (e) **Registered Capacity** sent out (**MW**);
- (f) **Maximum Generation** and **Minimum Generation** capability sent out (**MW** sent out);

- (g) **Reactive Power** capability (both leading and lagging) at the lower voltage terminals of the **Generator Transformers for Maximum Generation**, normal full **Load** and normal minimum **Load**;
- (h) Maximum auxiliary **Demand** in **MW** and **MVA**r;
- (i) Inertia constant (**MW sec/MVA**);
- (j) Short circuit ratio;
- (k) Direct axis transient reactance;
- (l) Direct axis sub-transient time constant;
- (m) **Generator Transformer** rated **MVA**, positive sequence reactance, and tap change range;
- (n) **Sustained Load Diagram**; and
- (o) a list of the **CCGT Modules** in the **CCGT Installation**, identifying each **CCGT Module**, and the **CCGT Installation** of which it forms part unambiguously, together with any other information which may be relevant in relation to the **CCGT Modules** and **CCGT Installations** and their operation.

In relation to the wind turbines comprised within a **WFPS**, such data equivalent to that listed in PC.B2.2.2(a) to PC.B2.2.2(n) as the **TSO** shall reasonably require.

OPERATING CODE

OC1.5 DEMAND FORECASTS

OC1.5.1 The following factors will be taken into account by the **TSO** when conducting **Demand** forecasting in the **Operational Planning Phase** and in the **Programming Phase**:-

- (a) historic generation output information recorded by the **TSO** or submitted by the **DNO** in accordance with OC1.4.1.2;
- (b) local factors known to the **TSO** in advance which may affect **Demand** on the **NI System**, for example trade holidays and school holidays;
- (c) anticipated **Loading** profiles submitted by the **DNO** in respect of **Independent Generating Plant** pursuant to OC1.4.1.3;
- (d) prospective new **Demand** for **Energy** exceeding 2**MW** on the **NI System** submitted in accordance with the terms of the Planning Code;

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- (e) **Customer Demand Management** of which the **TSO**, is aware in accordance with OC4;
- (f) estimated **Energy** sales information submitted by **Suppliers** pursuant to OC1.4.1.1;
- (g) anticipated transfers across **Interconnectors** and the **Inter-jurisdictional Tie Lines** between Northern Ireland and the Republic of Ireland; and
- (h) other information supplied by **Users**.

The peak daily **Demand** forecast in the **Operational Planning Phase** will become the **Average Cold Spell Demand** forecast which is utilised by the **TSO** to determine whether the **Licence Standards** can be met.

OC2.1 INTRODUCTION

OC2.1.1 **Operational Planning** involves planning through various timescales, the matching of generating capacity with forecast **Demand** on the **All Island Networks** together with a reserve of generation to provide the **Margin** taking into account **Outages** of **CDGUs** (and/or in the case of a **CCGT Installation**, **CCGT Modules** as provided in OC2), **Dispatchable WFPSs**, **Controllable WFPSs**, **Power Station Equipment** and **Outages** of and constraints on parts of the **NI System** and taking into account the output of **Independent Generating Plant** and transfers of electricity across any **Interconnector** and the **Inter-jurisdictional Tie Line** between Northern Ireland and the Republic of Ireland, in order to maintain the security and integrity of the **NI System**.

OC3.4 CONSTITUENTS OF OPERATING MARGIN

The **Operating Margin** comprises **Contingency Reserve** and **Operating Reserve**.

OC3.4.1 Contingency Reserve

Contingency Reserve is the margin of generation over forecast **Demand** which is required to be held in Northern Ireland in the period from 24 hours ahead down to real time to cover against uncertainties in generating plant **Availability** and **Interconnector Availability** and against both weather forecast and **Demand** forecast errors. It is provided by **Generating Plant** in Northern Ireland which is not required to be **Synchronised** but which must be held available to **Synchronise** within a defined timescale as provided in OC3.4.6.1.

OC3.4.2 **Operating Reserve**

OC3.4.2.1 **Operating Reserve** is additional output from **Generating Plant** in Northern Ireland, additional **Interconnector** transfer and/or reduction in **Demand** which must be realisable in real time operation to respond in order to contribute to containing and correcting any **System Frequency** deviation to an acceptable level, within the limits specified in the Electricity Supply Regulations (N.I.) 1991, in the event of a loss of generation or a loss of import from any **Interconnector** or mismatch between generation output and **Demand**.

OC3.4.6 **Provision of Operating Margin**

OC3.4.6.1 **Contingency Reserve**

This is the reserve held in Northern Ireland over, and above, **Operating Reserve**, which is required in the period from 24 hours ahead (SDC1 **Scheduling**) down to real time to cover against uncertainties of generation output, weather conditions and **Demand** forecast. The amount of **Contingency Reserve** required at the day ahead **Scheduling** stage under SDC1 and in subsequent timescales will be decided by the **TSO** acting in conjunction with the **Other TSO** on the basis of historical trends in the reduction in **Availability** of **CDGUs** and increases in forecast **Demand** up to real time operation.

OC4.1 **INTRODUCTION**

OC4.1.1 Operating Code No 4 ("OC4") is concerned with the provisions made by the **TSO** and procedures to be followed by the **TSO** and **Users** to permit a reduction in **Demand** in the event that there are insufficient **Generating Plant**, **WFPSs**, **Independent Generating Plant**, **Demand Side Units** or transfers across any **Interconnectors** and the **Inter-jurisdictional Tie Lines** between Northern Ireland and the Republic of Ireland available to meet **Demand** in all or any part of the **NI System** and/or in the event of problems on the **NI System**, including, without limitation, in the event of both a steady state shortfall of generation and a transient shortfall of generation following a sudden loss of generation. OC4 also covers operating problems such as

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unacceptable voltage levels and thermal overloads and also the provision of information on any **Demand Control** arrangements by **Suppliers**, including **Demand Control** arrangements providing for the utilisation of controllable **Load** blocks on the **NI System** (for example, by radio teleswitching). OC4 does not override and must be read in conjunction with the **Operating Security Standard**. The **Demand Control** arrangements may also apply where there are insufficient **Generating Plant**, **Demand Side Units** or transfers to meet **Demand** in all or any part of the **Other Transmission System** and/or in the event of problems on the **Other Transmission System** in circumstances where the **TSO** is able to assist the **Other TSO** and where doing so would not have a detrimental effect on the security of the **NI System**.

OC11.10.3 **Demand Side Units**

OC11.10.3.1 **Monitoring of Demand Side Units** will be undertaken by the **TSO** in accordance with the applicable **Agreed Testing and Monitoring Procedure**.

OC11.10.3.2 If a **Demand Side Unit** is found by the **TSO** to be non-compliant pursuant to OC11.10.3.1 the **TSO** may re-register the value of the **User's** declared **Demand Side Unit MW Availability** in accordance with the provisions of the applicable **Agreed Testing and Monitoring Procedure**.

SCHEDULING AND DISPATCH CODE

SDC1.2 **OBJECTIVE**

The objectives of SDC1 are:

- (a) to enable the **TSO**, in conjunction with the **Other TSO**, to prepare two **Indicative Operations Schedules** (utilising, amongst other things, a **Merit Order**) one for the present **Trading Day** and one for the following **Trading Day** to be used in the **Scheduling** and **Dispatch** process for these **Trading Days**;
- (b) to thereby ensure (so far as possible) the integrity of the **Transmission System** and to ensure that the **TSO** acts in conjunction with the **Other TSO**

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so that the **Other TSO** can ensure the integrity of the **Other Transmission System** (with the **Other TSO** having a similar objective);

- (c) to ensure the security and quality of supply in relation to the **Transmission System** and to ensure that the **TSO** acts in conjunction with the **Other TSO** so that the **Other TSO** can ensure the security and quality of supply in relation to the **Other Transmission System** (with the **Other TSO** having a similar objective);
- (d) to ensure that there is sufficient capacity to meet the electrical power **Demand**, and thereby in conjunction with the **Other TSO** to ensure that there is sufficient capacity to meet the **Demand** on the Island of Ireland at all times and in both cases together with an appropriate margin of reserve;
- (e) to publish an **Indicative Operations Schedule** as provided for in this SDC1.

SDC2.2

OBJECTIVE

The procedure for the issue of **Dispatch Instructions** by the **TSO**, is intended to enable (as far as possible) the **TSO** to match continuously **CDGU, Demand Side Unit, Aggregated Generating Units** output (or reduction as the case may be) and/or **Interconnector** transfers to **Demand**, and thereby in conjunction with the **Other TSO**, the **Demand** on the Island of Ireland, by utilising the **Merit Order** derived pursuant to SDC1 and the factors to be taken into account listed there and by taking into account any **NCDGU MW Output** in both cases together with an appropriate margin of reserve, whilst maintaining (so far as possible) the integrity of the **Transmission System** together with the security and quality of supply (with the **Other TSO** having a similar objective with regard to its **Transmission System**).

SDC 1.4

PROCEDURE

SDC1.4.1

Availability Notice

SDC1.4.1.1

Requirement

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- (a) Each **User** shall, by not later than **Gate Closure** each day, notify the **TSO** by means of an **Availability Notice** (in such form as the **TSO** may reasonably notify from time to time or in the form published on the **TSO** website) of the **Availability**, available transfer capacity and/or **Demand Side Unit MW Availability** (as the case may be) of each of its:
- (i) **CDGUs**;
 - (ii) **Controllable WFPSs**;
 - (iii) **Pumped Storage Plant Demand**;
 - (iv) **Interconnectors** (to be submitted by the **Interconnector Owner**);
 - (v) **Demand Side Units**; or
 - (vii) **Aggregated Generating Units** as the case may be.
- (b) A **User** may satisfy this obligation by submitting the data under the **TSC**, unless the **TSO** requires, by notice to the **User**, the data to be submitted to it directly under the **Grid Code**.
- (c) A **Generator Aggregator** will satisfy the obligation in this SDC1.4.1.1 by notifying to the **TSO** in an **Availability Notice** in the form described in paragraph (a) above the **Availability** of its **Aggregated Generating Units** as the case may be.

SDC1.4.1.2 Content

- (a) The **Availability Notice** shall state the:
- (i) **Availability** of the relevant:
 - **CDGU**; or
 - **Controllable WFPSs**; or

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- (ii) the **Demand Side Unit MW Availability** of the **Demand Side Unit** or **Pumped Storage Plant Demand**; or

SDC1.4.3.4 **Availability of Demand Side Units**

Each **Dispatchable Demand Customer** shall, subject to the exceptions in SDC1.4.3.5, use reasonable endeavours to ensure that it does not at any time declare the **Demand Side Unit MW Availability** and the **Demand Side Unit** characteristics of its **Demand Side Unit** at levels or values different from those that the **Demand Side Unit** could achieve at the relevant time. The **TSO** can reject declarations to the extent that they do not meet these requirements.

SDC1.4.3.5 SDC1.4.3.4 shall not apply to the extent:

- (a) it would require the **Dispatchable Demand Customer** to declare levels or values better than **Demand Side Unit MW Capacity** and **Technical Parameters** as submitted under the Planning Code in respect of a **Demand Side Unit**;
- (b) necessary during periods of **Planned Outage** or **Planned Maintenance Outage** or otherwise with the consent of the **TSO**;
- (c) necessary while repairing or maintaining the **Demand Side Unit** or equipment necessary to the operation of the **Demand Side Unit** where such repair or maintenance cannot reasonably, in accordance with **Prudent Operating Practice**, be deferred to a period of **Planned Outage** or **Planned Maintenance Outage**
- (d) necessary to avoid an imminent risk of injury to persons or material damage to property (including the **Demand Side Unit**);
- (e) it is not lawful for the **Dispatchable Demand Customer** to change its **Demand Side Unit MW Response** or to operate its **Demand Side Unit**.

SDC1.4.3.6 **Changes in Availability:**

- (a) **Increasing:** If a **Generator**, a **Generator Aggregator** or a **Dispatchable Demand Customer** in respect of a **CDGU**, an **Aggregated Generating Unit**, a **Demand Side Unit** or **Pumped Storage Plant** in relation to **Demand**, issues an **Availability Notice** or a **Re-declaration** increasing (from zero or otherwise) the level of **Availability** or **Demand Side Unit MW Availability** from a specified time, such notice shall be construed as meaning that:
- (i) in the case of a **CDGU** and/or **Aggregated Generating Unit**, the **CDGU** and/or **Aggregated Generating Unit** is capable of being synchronised to the **Transmission System** or **Distribution System** at that specified time or increasing its **MW Output** at that specified time as the case may be;
 - (ii) in the case of a **CDGU** which is an **Open Cycle Gas Turbine**, the **CDGU** is capable of being started at that specified time; or
 - (iii) in the case of a **Demand Side Unit**, the **Demand Side Unit** is capable of delivering a greater **Demand Side Unit MW Response** at that specified time.

SDC1.4.4.2 **Additional Grid Code Characteristics Notice**

The following items are required to be submitted by each **User**, with the exception of Aggregators, direct to the **TSO**:

- (e) In relation to each Demand Side Unit, the **Demand Side Unit Energy Profile** and the **Initial Demand Side Unit MW Response Time**

SDC1.4.4.4 Other Relevant Data

- (a) By not later than **Gate Closure** each day, each **User** in respect of each of its **Plant**, shall in respect of the following **Trading Day** submit to the **TSO** in writing in the form set out on the **TSO** website or in such other form as the **TSO** may reasonably notify to each **User** from time to time), details in

relation to the following **Trading Day** of any newly arisen special factors, including abnormal risk to loss, which in the reasonable opinion of the **User** may have a material effect on the likely **MW Output** or **Demand Side Unit MW Response** of such **Plant** (including, for a **CCGT Installation** in relation to each of the **CCGT Modules** therein). The notice shall be consistent with the **User's** obligations under SDC1.4.3.2. The provisions of this paragraph also apply to **Interconnector Owners** in relation to their **Interconnector Filters**.

SDC1.4.8.4 Taking account of and applying the factors referred to in SDC1.4.8.3, the **Indicative Operations Schedule** shall be compiled by the **TSO** in conjunction with the **Other TSO** to **Schedule** such **CDGUs, Controllable WFPS, Pumped Storage Plant Demand, Demand Side Units, Aggregated Generating Units** and/or such **Interconnector** tranches, and equivalent units or tranches of equivalent units in the Republic of the Ireland, which have been declared **Available** in an **Availability Notice** (and the equivalents on the **Other Transmission System**):

- (ii) as will in aggregate (after taking into account electricity delivered other than from **CDGUs, Controllable WFPSs, Aggregated Generating Units**, and/or **Interconnector** tranches and variation in **Demand** from **Pumped Storage Plant Demand** and **Demand Side Units**) be sufficient to match at all times (to the extent possible having regard to the **Availability** or **Demand Side Unit MW Availability** of **CDGUs, Controllable WFPSs, Pumped Storage Plant Demand, Demand Side Units, Aggregated Generating Units** and **Interconnector** tranches) the forecast aggregated **Demand** (derived under OC1 of the **Grid Code** and the **Other Grid Code**) together with such margin of reserve as the **TSO** working in conjunction with the **Other TSO** shall consider to be appropriate; and

SDC1.4.8.5 After the completion of the **Scheduling** process, and the issuing of the **Indicative Operations Schedule**, the **TSO** may consider it necessary to make adjustments to the MW output as determined by the **Scheduling** process. Such adjustments could be made necessary by any of the following factors (and the equivalent factors on the

Other Transmission System which will be so dealt with separately by the **Other TSO**):

- (a) changes to **Availability** or **Demand Side Unit MW Availability** and/or **Technical Parameters** of **CDGUs** and/or **Controllable WFPS** and/or **Aggregated Generating Units** and/or **Demand Side Units** notified to the **TSO** after the commencement of the **Scheduling** process;

- SDC1.4.8.7
- (a) The **Synchronising** and **De-Synchronising** times (and, in the case of **Pumped Storage Plant Demand**, the relevant effective time) shown in the **Indicative Operations Schedule** are indicative only and it should be borne in mind by **Users** that the **Dispatch Instructions** could reflect more or different **CDGU**, **Aggregated Generating Unit** and/or **Controllable WFPS**, **Pumped Storage Plant Demand** and/or **Aggregate Generating Unit** requirements than in the **Indicative Operations Schedule**. The **TSO** may issue **Dispatch Instructions** in respect of any **CDGU** and/or **Aggregated Generating Unit**, **Controllable WFPS**, **Pumped Storage Plant Demand** or **Aggregated Generating Unit** which has not declared an **Availability** or **Demand Side Unit MW Availability** of 0 MW in an **Availability Notice**. **Users** with **CDGUs** and/or **Aggregated Generating Units**, **Controllable WFPS**, **Pumped Storage Plant Demand** shall ensure that their units are able to be **Synchronised**, or in the case of **Pumped Storage Plant Demand**, used at the times **Scheduled**, but only if so **Dispatched** by the **TSO** by issue of a **Dispatch Instruction**. **Users** shall, as part of a revision to the **Technical Parameters**, indicate to the **TSO** the latest time at which a **Dispatch Instruction** is required to meet the scheduled **Synchronising** time or in the case of **Pumped Storage Plant Demand**, the **Scheduled** relevant effective time.
 - (b) The provisions of SDC1.4.8.7(a) shall apply to **Demand Side Units** with the exception that reference to relevant effective time shall be read as a reference to **Initial Demand Side Unit Response Time**.

SDC1 – APPENDIX A

Part 1. Technical Parameters

Technical Parameter	CDGU				Control WFPS	DSU		Agg-Gen		Pump Storage Demand
	Thermal	Hydr/En Ltd	Disp. WFPS	Pump S Gen		Individual Demand Site	Aggregate d Demand Sites			
Block Load Cold	✓	✓	✓	✓	✓					
Block Load Hot	✓									
Block Load Warm	✓									
Demand Side Unit Energy Profile						✓	✓			
Deload Break Point	✓	✓	✓	✓	✓					
De-Loading Rate 1	✓	✓	✓	✓	✓					
De-Loading Rate 2	✓	✓	✓	✓	✓					
Dwell Time 1	✓	✓	✓	✓	✓					
Dwell Time 2	✓	✓	✓	✓	✓					
Dwell Time 3	✓	✓	✓	✓	✓					
Dwell Time Trigger Point 1	✓	✓	✓	✓	✓					
Dwell Time Trigger Point 2	✓	✓	✓	✓	✓					
Dwell Time Trigger Point 3	✓	✓	✓	✓	✓					
End Point of Start Up Period	✓	✓	✓	✓	✓					
Energy Limit		✓								
Energy Limit Factor		✓								
Energy Limit Start		✓								
Energy Limit Stop		✓								
Forecast Minimum Output Profile				✓						✓
Forecast Minimum Generation Profile	✓	✓	✓	✓		✓	✓			
Initial Demand Side Unit Response Time						✓	✓			
Load Up Break Point Cold (1)	✓	✓	✓	✓	✓					
Load Up Break Point Cold (2)	✓	✓	✓	✓	✓					
Load Up Break Point Hot (1)	✓									
Load Up Break Point Hot (2)	✓									
Load Up Break Point Warm (1)	✓									
Load Up Break Point Warm (2)	✓									

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Technical Parameter	CDGU				Control WFPS	DSU		Agg. Gen		Pump Storage Demand
	Thermal	Hydr/ En Ltd	Disp. WFPS	Pump S Gen		Individual Demand Site	Aggregate d Demand Sites			
Loading Rate Cold (1)	✓	✓	✓	✓	✓					
Loading Rate Cold (2)	✓	✓	✓	✓	✓					
Loading Rate Cold (3)	✓	✓	✓	✓	✓					
Loading Rate Hot (1)	✓									
Loading Rate Hot (2)	✓									
Loading Rate Hot (3)	✓									
Loading Rate Warm (1)	✓									
Loading Rate Warm (2)	✓									
Loading Rate Warm (3)	✓									
Max Ramp Down Rate (shall be a number greater than zero)						✓	✓			
Max Ramp Up Rate (shall be a number greater than zero)						✓	✓			
Maximum Down Time						✓	✓			
Maximum Generation / Registered Capacity	✓	✓	✓	✓	✓					
Maximum On Time	✓	✓	✓	✓	✓					
Maximum Storage Capacity				✓						
Minimum Down Time						✓	✓			
Minimum Generation	✓	✓	✓	✓	✓					
Minimum off time	✓	✓	✓	✓	✓					
Minimum on time	✓	✓	✓	✓	✓					
Minimum Storage Capacity				✓						✓✓
(Other relevant technical parameters)	✓	✓	✓	✓	✓			✓		
Pumping capacity				✓						✓
Ramp Down Break Point 1	✓	✓	✓	✓	✓			✓		
Ramp Down Break Point 2	✓	✓	✓	✓	✓			✓		
Ramp Down Break Point 3	✓	✓	✓	✓	✓			✓		
Ramp Down Break Point 4	✓	✓	✓	✓	✓			✓		
Ramp Down Rate 1	✓	✓	✓	✓	✓			✓		
Ramp Down Rate 2	✓	✓	✓	✓	✓			✓		
Ramp Down Rate 3		✓	✓	✓	✓			✓		
Ramp Down Rate 4	✓	✓	✓	✓	✓			✓		
Ramp Down Rate 5	✓	✓	✓	✓	✓			✓		
Ramp Up Break Point 1	✓	✓	✓	✓	✓			✓		
Ramp Up Break Point 2	✓	✓	✓	✓	✓			✓		
Ramp Up Break Point 3	✓	✓	✓	✓	✓			✓		
Ramp Up Break Point 4	✓	✓	✓	✓	✓			✓		

Technical Parameter	CDGU				Control WFPS	DSU		Agg-Gen		Pump Storage Demand
	Thermal	Hydr/En Ltd	Disp. WFPS	Pump S Gen		Individual Demand Site	Aggregate d Demand Sites			
Ramp Up Rate 1	✓	✓	✓	✓	✓			✓		
Ramp Up Rate 2	✓	✓	✓	✓	✓			✓		
Ramp Up Rate 3	✓	✓	✓	✓	✓			✓		
Ramp Up Rate 4	✓	✓	✓	✓	✓			✓		
Ramp Up Rate 5	✓	✓	✓	✓	✓			✓		
Short Term Maximisation Capability	✓	✓	✓	✓	✓					
Soak Time Cold (1)	✓	✓	✓	✓	✓					
Soak Time Cold (2)	✓	✓	✓	✓	✓					
Soak Time Hot (1)	✓									
Soak Time Hot (2)	✓									
Soak Time Trigger Point Cold (1)	✓	✓	✓	✓	✓					
Soak Time Trigger Point Cold (2)	✓	✓	✓	✓	✓					
Soak Time Trigger Point Hot (1)	✓									
Soak Time Trigger Point Hot (2)	✓									
Soak Time Trigger Point Warm (1)	✓									
Soak Time Trigger Point Warm (2)	✓									
Soak Time Warm (1)	✓									
Soak Time Warm (2)	✓									
Synchronous Start-Up Time Cold	✓	✓	✓	✓	✓					
Synchronous Start-Up Time Hot	✓	✓	✓	✓	✓					
Synchronous Start-Up Time Warm	✓									
Target Reservoir Level Percentage				✓						✓
Start of Restricted Range 1	✓	✓	✓	✓	✓					
End of Restricted Range 1	✓	✓	✓	✓	✓					
Start of Restricted Range 2	✓	✓	✓	✓	✓					
End of Restricted Range 2	✓	✓	✓	✓	✓					

SDC2.4.2.9 (a) To preserve **System** integrity under emergency circumstances where, for example, **Licence Standards** cannot be met the **TSO** may, however, issue **Dispatch Instructions** to change **CDGU**, **Aggregated Generating Units**, **Demand Side Unit**, **Interconnector** transfers and/or **Pumped Storage Plant Demand MW Output** or **Demand Side Unit MW Response** even when this is outside parameters so registered or so amended. This may, for example, be an instruction to trip or partially load a **CDGU**. The instruction will be stated by the **TSO** to be one in relation to emergency circumstances under SDC2.4.2.9

SDC2.4.2.13 (a) Subject to the exception set out below in this SDC2.4.2.13, **Generators** will only **Synchronise** or **de-Synchronise** **CDGUs** to the **Dispatch Instructions** of the **TSO** or unless it occurs automatically as a result of **Special Protection Schemes** or **Low Frequency Relay** operations. Subject to the exception set out below in this SDC2.4.2.13, **Dispatchable Demand Customers** will only reduce or increase their **Demand Side Unit MW Response** to the **Dispatch Instructions** of the **TSO** or unless it occurs automatically as a result of **Special Protection Schemes** or **Low Frequency Relay** operations.

(b) **De-Synchronisation** may otherwise only take place without the **TSO's** prior agreement if it is to avoid, in the **Generator's** reasonable opinion, an imminent risk of injury to persons or material damage to property (including the **CDGU**). **Demand Side Units**, who can not maintain the provision of any **Demand Side Unit MW Response**, may otherwise only take place without the **TSO's** prior agreement if it is to avoid, in the **Dispatchable Demand Customer's** reasonable opinion, an imminent risk of injury to persons or material damage to property (including the **Demand Side Unit**).

SDC2.A.2.2 The **Dispatch Instruction** given by **Electronic Interface**, telephone, or facsimile transmission will normally follow the form:

(a) where appropriate, the specific **CDGU** or **User's Plant** to which the instruction applies;

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(b) the **MW Output** (or **Demand Side Unit MW Response**) to which it is instructed;

SDC2.A.12 **Dispatching a Demand Side Unit to change Demand Side Unit MW Response**

SDC2.A.12.1 If the time of the **Dispatch Instruction** is 1400 hours, the Unit is Unit 1 and the **Demand Side Unit MW Response** to be achieved is 10 MW, the relevant part of the instruction would be, for example:

"Time 1400 hours. Unit 1 10 MW"

SDC2.A.12.2 If the start time is 1415 hours, it would be, for example:

"Time 1400 hours. Unit 1 10MW, start at 1415 hours"

SDC2.A.13 **Dispatching a Demand Side Unit to an Initial Demand Side Unit Response**

SDC2.A.13.1 In this instance, for **Demand Side Units**, the **Dispatch Instruction** issue time will always have due regard for the **Initial Demand Side Unit Response Time** declared to the **TSO** by the **Dispatchable Demand Customer** as a **Technical Parameter** or as part of **Additional Grid Code Characteristics Notice** data.

The instruction will follow the form, for example:

"Time 1300 hours. Unit 1, **Initial Demand Side Unit Response** at 1600 hours"

In relation to an instruction to the **Initial Demand Side Unit Response**, the start time referred to in SDC2.A.12.1 will be deemed to be the time at which **Initial Demand Side Unit MW Response** is to take place.

SCHEDULE 1

DATA REGISTRATION CODE

GENERATING UNIT AND POWER STATION TECHNICAL DATA

POWER STATION NAME:

DATE:

DATA DESCRIPTION	UNITS	DATA CAT.	GENERATING UNIT OR POWER STATION DATA							
			G1	G2	G3	G4	G5	G6	G7	STN
GENERAL POWER STATION DATA										
Point of connection to the NI System in terms of geographical and electrical location and System voltage	-	SPD	-	-	-	-	-	-	-	-
Capacity of Power Station in MW sent out for R.C., Min. Gen. (assumed to be zero in the case of WFPSs unless a different value is notified by the User) and, where relevant Max. Gen.	MW	SPD	-	-	-	-	-	-	-	-
In the case of Controllable WFPSs or Dispatchable WFPSs , a diagram that shows for the Controllable WFPS or Dispatchable WFPS wind speed and direction against electrical output in MW , in “rose” format.		SPD								
Maximum auxiliary Demand (Active Power and Reactive Power)	MW	SPD	-	-	-	-	-	-	-	-
	Mvar	SPD	-	-	-	-	-	-	-	-
Where Generating Units form part of a User's System , the number of such Units together with their total capacity. If required by the TSO , details of the Generating Units together with their energy output profile.		SPD								
Operating regime of Generating Units not subject to Central Dispatch (e.g. continuous, intermittent, peak lopping).		SPD								-
		SPD								
		SPD								
GENERAL GENERATING UNIT DATA Prime mover type		SPD								
Generating Unit type	MVA	SPD								
Generating Unit rating and terminal voltage	KV									-
Generating Unit rated power factor		SPD								-

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DATA DESCRIPTION	UNITS	DATA CAT.	GENERATING UNIT OR POWER STATION DATA								
			G1	G2	G3	G4	G5	G6	G7	STN	
Registered Capacity sent out	MW	SPD									-
Max.Gen. and Min.Gen. capability sent out	MW	SPD									-
Reactive Power capability (both leading and lagging) at the lower voltage terminals of the Generator Transformer for Max.Gen. , normal Full Load and normal minimum Load .	Mvar	SPD									-
Maximum Auxiliary Demand	MW Mvar	SPD									
Inertia constant	MW sec MVA	SPD									

ABBREVIATIONS:

SPD = Standard Planning Data	DPD = Detailed Planning Data
Min Gen = Minimum Generation	Max Gen = Maximum Generation
% on MVA = % on Rated MVA	RC = Registered Capacity
% on 100 = % on 100 MVA	OC1,SDC1,etc = Grid Code for which data is required

DATA DESCRIPTION	UNITS	DATA CAT	GENERATING UNIT OR POWER STATION DATA								
			G1	G2	G3	G4	G5	G6	G7	STN	
Short circuit ratio		SPD									-
Direct axis transient reactance	% on MVA	SPD									-
Direct axis sub-transient time constant	S	SPD									-
Generator Transformer rated MVA, positive sequence reactance and tap change range	MVA % on MVA +%/-%	SPD									-
Sustained Load Diagram	Diagram	SPD									-
In relation to the wind turbines comprised within a WFPS , such General Generating Unit Data equivalent to that listed above as the TSO shall reasonably require.		SPD									-
A list of the CCGT Modules in the CCGT Installation identifying each CCGT Module , and the CCGT Installation of which it forms part unambiguously, together with other relevant information.	List	SPD									-
<u>Auxiliary Demand</u>											
The normal Generating Unit -supplied auxiliary Load for each Generating Unit at rated MW output	MW	DPD									-
The Power Station auxiliary Load , if any, additional to the Generating Unit supplied auxiliary Load where the Power Station auxiliary Load is supplied from the NI System	MW	DPD	-	-	-	-	-	-	-	-	-
<u>Generating Unit parameters</u>											
Rated terminal voltage	kV	DPD									-

Rated MVA	MVA	DPD									-
Rated MW	MW	DPD									-
Min.Gen.	MW	DPD									-
Short circuit ratio		DPD									-
Direct axis synchronous reactance	% on MVA	DPD									-
Direct axis transient reactance	% on MVA	DPD									-
Direct axis sub-transient reactance	% on MVA	DPD									-
Direct axis transient time constant	S	DPD									-
Direct axis sub-transient time constant	S	DPD									-

DATA DESCRIPTION	UNITS	DATA CAT	GENERATING UNIT OR POWER STATION DATA								
			G1	G2	G3	G4	G5	G6	G7	STN	
Quadrature axis synchronous reactance	% on MVA	DPD									-
Quadrature axis transient reactance	% on MVA	DPD									-
Quadrature axis sub-transient reactance	% on MVA	DPD									-
Quadrature axis transient time constant	S	DPD									-
Quadrature axis sub-transient time constant	S	DPD									-
Stator time constant	S	DPD									-
Stator resistance		DPD									-
Stator leakage reactance	% on MVA	DPD									-
Turbogenerator inertia constant, or, for wind turbines comprised within a WFPS , Plant inertia constant	MWsec/ MVA	DPD									-
Other than for wind turbines comprised within a WFPS , rated field current	A	DPD									-

SCHEDULE 2

DATA REGISTRATION CODE

GENERATION PLANNING PARAMETERS, RESPONSE CAPABILITY DATA AND SDC1 DATA

Part 1 of this schedule contains the **CDGU and Controllable WFPS or Dispatchable WFPSs Generation Planning Parameters** required by the **TSO** to facilitate studies in **Operational Planning** timescales. It also contains the response capability data for **CDGUs**.

Part 2 of this schedule contains the data required with respect to **CDGUs, Pumped Storage Plant Demand, Interconnectors, Interconnector Units, Demand Side Units, Aggregated Generating Units** and/or **Controllable WFPS** to be supplied by **Users** by **Gate Closure** pursuant to SDC1. Many of these parameters are the same as those required in Part 1, but the data supplied under Part 1 will not be used for real time operation.

Power Station: _____

Part 1 - Generation Planning Parameters

DATA DESCRIPTION	UNITS	DATA CAT.	GENERATING UNIT OR POWER STATION DATA								
			G1	G2	G3	G4	G5	G6	G7	STN	
<u>Generation Planning Parameters for CDGUs</u>											
The minimum notice required to Synchronise a Generating Unit from De-synchronisation	Mins	OC2									-
The minimum time between Synchronising different Generating Units in a Power Station	Mins	OC2									
The minimum block Load requirements on Synchronising		OC2									
Maximum Generating Unit Loading rates from Synchronising for the following conditions:-											
hot	MW/ min	OC2									-
Warm	MW/ min	OC2									-
cold	MW/ min	OC2									-
Minimum time off Load		OC2									
Maximum Generating Unit Deloading rates for the following conditions:-											
Hot	MW/ min	OC2									-
warm	MW/ min	OC2									-
cold	MW/ min	OC2									-

DATA DESCRIPTION	UNITS	DATA CAT.	GENERATING UNIT OR POWER STATION DATA								
			G1	G2	G3	G4	G5	G6	G7	STN	
Maximum allowable starts per year:- hot warm cold		OC2 OC2 OC2									- - -
<u>Generation Planning Parameters for Controllable WFPSs or Dispatchable WFPSs</u>											
The minimum time to connect/reconnect the Controllable WFPS or Dispatchable WFPS (or part thereof) to the NI System following a Dispatch instruction		OC2									
The minimum time to connect/reconnect the Controllable WFPS or Dispatchable WFPS (or part thereof) to the NI System automatically following a trip of the Controllable WFPS or Dispatchable WFPS (or part thereof) that does not cause damage to the Controllable WFPS or Dispatchable WFPS (or part thereof)		OC2									
The maximum rate at which Load can be increased following connection of the Controllable WFPS or Dispatchable WFPS (or part thereof) to the NI System		OC2									
The minimum fault level or voltage at the Connection Point below which the Controllable WFPS or Dispatchable WFPS cannot be connected		OC2									
<u>Operating Reserve to Frequency change</u>											-
Operating Reserve to Frequency change to be given in a tabular form, describing Primary Operating Reserve, Secondary Operating Reserve, Tertiary Operating Reserve band 1, Tertiary Operating Reserve band 2 at different levels of Load , ranging from Minimum Generation to Registered Capacity	Table	OC3									
<u>Governor Droop Characteristics</u>											
Governor Droop	%	OC3									
<u>Unit Control Options</u>											
Maximum Droop	%	OC3									
Normal Droop	%	OC3									
Minimum Droop	%	OC3									

Part 2: Availability, Technical Parameters Data and other data required under SDC1

The following information is required daily by not later than **Gate Closure** to cover the next following **Trading Day** in relation to each **CDGU, Pumped Storage Plant Demand, Interconnector, Interconnector Units** (only in relation to paragraph 6 below), **Demand Side Unit, Aggregated Generating Unit** and/or **Controllable WFPS**. In so far as the **Availability** data is not so submitted, the data to have been submitted in respect of the last **Trading Period** of the current **Trading Day** will be deemed to have been resubmitted. Any further revisions to this data are required to be notified to the **TSO** when they become known.

1 **Availability**

Each **User** must notify the **TSO** by means of an **Availability Notice** of the **Availability** of each of its **CDGUs** (and in the case of a **CCGT Installation**, the **CCGT Modules** within it), **Pumped Storage Plant Demand, Interconnectors, Demand Side Units, Aggregated Generating Units** and/or **Controllable WFPS**.

The **Availability Notice** shall state the **Availability** of the relevant **CDGU** for each **Trading Period** in the following **Trading Day** (subject to revision under SDC1.4.5.1 (a)).

In addition, **Users** other than **Aggregators** and **Dispatchable Demand Customers** must submit an **Additional Grid Code Availability Notice** under SDC1.4.2 by no later than **Gate Closure** each day. The information contained in an **Additional Grid Code Availability Notice** broadly relates to a **CDGU's** different **Availabilities** depending on which fuel a **CDGU** is firing on (for a **CDGU** that is capable of firing on different fuels), the **Availability** of each **CCGT Module** within a **CCGT Installation** and to the various long-term constraints (such as fuel and emissions constraints) which can affect the **Availability** of a **CDGU**.

2. **Technical Parameters**

For each **CDGU, Controllable WFPS, Dispatchable WFPS, Demand Side Unit, Aggregated Generating Unit** and **Pumped Storage Plant Demand**, the **Technical Parameters** listed in the table set out in Appendix A to SDC1 and copied below. The factors applicable to a particular **Plant** are indicated with a tick.

Technical Parameter	CDGU				Control WFPS	DSU		Agg. Gen	Pump Storage Demand
	Thermal	Hydr/ En Ltd	Disp. WFPS	Pump S Gen		Individual Demand Site	Aggregated Demand Sites		
Block Load Cold	✓	✓	✓	✓	✓				
Block Load Hot	✓								
Block Load Warm	✓								
Demand Side Unit Energy Profile						✓	✓		
Deload Break Point	✓	✓	✓	✓	✓				
De-Loading Rate 1	✓	✓	✓	✓	✓				
De-Loading Rate 2	✓	✓	✓	✓	✓				
Dwell Time 1	✓	✓	✓	✓	✓				
Dwell Time 2	✓	✓	✓	✓	✓				

Technical Parameter	CDGU				Control WFPS	DSU		Agg. Gen	Pump Storage Demand
	Thermal	Hydr/ En Ltd	Disp. WFPS	Pump S Gen		Individual Demand Site	Aggregated Demand Sites		
Dwell Time 3	✓	✓	✓	✓	✓				
Dwell Time Trigger Point 1	✓	✓	✓	✓	✓				
Dwell Time Trigger Point 2	✓	✓	✓	✓	✓				
Dwell Time Trigger Point 3	✓	✓	✓	✓	✓				
End Point of Start Up Period	✓	✓	✓	✓	✓				
Energy Limit		✓							
Energy Limit Factor		✓							
Energy Limit Start		✓							
Energy Limit Stop		✓							
Forecast Minimum Output Profile				✓					✓
Forecast Minimum Generation Profile	✓	✓	✓	✓		✓	✓		
Initial Demand Side Unit Response Time						✓	✓		
Load Up Break Point Cold (1)	✓	✓	✓	✓	✓				
Load Up Break Point Cold (2)	✓	✓	✓	✓	✓				
Load Up Break Point Hot (1)	✓								
Load Up Break Point Hot (2)	✓								
Load Up Break Point Warm (1)	✓								
Load Up Break Point Warm (2)	✓								
Loading Rate Cold (1)	✓	✓	✓	✓	✓				

Technical Parameter	CDGU				Control WFPS	DSU		Agg. Gen	Pump Storage Demand
	Thermal	Hydr/ En Ltd	Disp. WFPS	Pump S Gen		Individual Demand Site	Aggregated Demand Sites		
					-				-
Loading Rate Cold (2)	✓	✓	✓	✓	✓				
Loading Rate Cold (3)	✓	✓	✓	✓	✓				
Loading Rate Hot (1)	✓								
Loading Rate Hot (2)	✓								
Loading Rate Hot (3)	✓								
Loading Rate Warm (1)	✓								
Loading Rate Warm (2)	✓								
Loading Rate Warm (3)	✓								
Max Ramp Down Rate (shall be a number greater than zero)						✓	✓		
Max Ramp Up Rate (shall be a number greater than zero)						✓	✓		
Maximum Down Time						✓	✓		
Maximum Generation / Registered Capacity	✓	✓	✓	✓	✓				
Maximum On Time	✓	✓	✓	✓	✓				
Maximum Storage Capacity				✓					
Minimum Down Time						✓	✓		
Minimum Generation	✓	✓	✓	✓	✓				
Minimum off time	✓	✓	✓	✓	✓				
Minimum on time	✓	✓	✓	✓	✓				
Minimum Storage Capacity				✓					✓✓
(Other relevant technical parameters)	✓	✓	✓	✓	✓			✓	

Technical Parameter	CDGU				Control WFPS	DSU		Agg. Gen	Pump Storage Demand
	Thermal	Hydr/ En Ltd	Disp. WFPS	Pump S Gen		Individual Demand Site	Aggregated Demand Sites		
					-				-
Pumping capacity				✓					✓
Ramp Down Break Point 1	✓	✓	✓	✓	✓			✓	
Ramp Down Break Point 2	✓	✓	✓	✓	✓			✓	
Ramp Down Break Point 3	✓	✓	✓	✓	✓			✓	
Ramp Down Break Point 4	✓	✓	✓	✓	✓			✓	
Ramp Down Rate 1	✓	✓	✓	✓	✓			✓	
Ramp Down Rate 2	✓	✓	✓	✓	✓			✓	
Ramp Down Rate 3		✓	✓	✓	✓			✓	
Ramp Down Rate 4	✓	✓	✓	✓	✓			✓	
Ramp Down Rate 5	✓	✓	✓	✓	✓			✓	
Ramp Up Break Point 1	✓	✓	✓	✓	✓			✓	
Ramp Up Break Point 2	✓	✓	✓	✓	✓			✓	
Ramp Up Break Point 3	✓	✓	✓	✓	✓			✓	
Ramp Up Break Point 4	✓	✓	✓	✓	✓			✓	
Ramp Up Rate 1	✓	✓	✓	✓	✓			✓	
Ramp Up Rate 2	✓	✓	✓	✓	✓			✓	
Ramp Up Rate 3	✓	✓	✓	✓	✓			✓	
Ramp Up Rate 4	✓	✓	✓	✓	✓			✓	
Ramp Up Rate 5	✓	✓	✓	✓	✓			✓	
Short Term Maximisation Capability	✓	✓	✓	✓	✓				
Soak Time Cold (1)	✓	✓	✓	✓	✓				
Soak Time Cold (2)	✓	✓	✓	✓	✓				
Soak Time Hot (1)	✓								
Soak Time Hot (2)	✓								

Technical Parameter	CDGU				Control WFPS	DSU		Agg. Gen	Pump Storage Demand
	Thermal	Hydr/ En Ltd	Disp. WFPS	Pump S Gen		Individual Demand Site	Aggregated Demand Sites		
Soak Time Trigger Point Cold (1)	✓	✓	✓	✓	✓				
Soak Time Trigger Point Cold (2)	✓	✓	✓	✓	✓				
Soak Time Trigger Point Hot (1)	✓								
Soak Time Trigger Point Hot (2)	✓								
Soak Time Trigger Point Warm (1)	✓								
Soak Time Trigger Point Warm (2)	✓								
Soak Time Warm (1)	✓								
Soak Time Warm (2)	✓								
Synchronous Start-Up Time Cold	✓	✓	✓	✓	✓				
Synchronous Start-Up Time Hot	✓	✓	✓	✓	✓				
Synchronous Start-Up Time Warm	✓								
Target Reservoir Level Percentage				✓					✓
Start of Restricted Range 1	✓	✓	✓	✓	✓				
End of Restricted Range 1	✓	✓	✓	✓	✓				
Start of Restricted Range 2	✓	✓	✓	✓	✓				
End of Restricted Range 2	✓	✓	✓	✓	✓				

Users should also refer to SDC1.4.5.2 for the submission of revised **Technical Parameters** data.

3. **Additional Grid Code Characteristics**

The following data are required to be submitted by each **User**, with the exception of **Aggregators**, direct to the **TSO**:

1. Individual **CCGT Module** data equivalent to the data required for a **CCGT Installation**. It shall also show any revisions to the **Technical Parameters** for each of the **CCGT Modules** within it.
2. In the case of a **CDGU** capable of firing on different fuels, an **Additional Grid Code Characteristics Notice** in respect of any additional fuel for the **CDGU**, each containing the information set out in the **Technical Parameters** for each fuel and each marked clearly to indicate to which fuel it applies.
3. In the case of **Interconnector Owners**, **Interconnector** data, including but not limited to the **Availability** of **Interconnector Filters**.
4. In relation to each **Demand Side Unit**, the **Demand Profile** and the **Initial Demand Reduction Time**.
5. Where there is a **System Support Services Agreement** in place, the **System Support Services** which are **Available**.
6. The parameters listed in the table in Part 2 of Appendix A to SDC 1 and copied below, where relevant to a **User**.
7. In the case of Kilroot **Power Station** and Ballylumford **Power Station**, which configuration referred to in PC.A3.3.12 the **Power Station** is operating at for each **Trading Period**.

The table contained in Part 2 of Appendix A to SDC1 and referred to at paragraph 6 above is copied below:

Variable	Applies to
Time from initiation of a start to achieving Dispatched Load	CDGUs which are Open Cycle Gas Turbines or CCGTs
Governor Droop	All CDGUs , except Aggregated Generating Units
Sustained Response Capability	All CDGUs , except Aggregated Generating Units
Two shifting limitation (limitation on the number of Start-ups per Trading Day)	All CDGUs , except Aggregated Generating Units
The MW and Mvar capability limits within which the CDGU is able to operate as shown in the relevant Generator Performance Chart	All CDGUs , except Aggregated Generating Units
Maximum number of on Load cycles per 24 hour period, together with the maximum Load increases involved	All CDGUs , except Aggregated Generating Units
^Maximum number of changes to the Dispatched Fuel per 24 hour period	All CDGUs , except Aggregated Generating Units

Variable	Applies to
Maximum quantity of oil in “ready-use tanks” and associated pipework	All CDGUs, except Aggregated Generating Units
^Maximum number of changes to the Designated Fuel per 24 hour period	All CDGUs, except Aggregated Generating Units
^Minimum notice to change the Designated Fuel .	All CDGUs, except Aggregated Generating Units
Settings of the Unit Load Controller for each CDGU for which a Unit Load Controller is required under CCS1.5.5 of the SONI Grid Code	All CDGUs, except Aggregated Generating Units
Declared Maximisation Capacity	All CDGUs, except Aggregated Generating Units
Time between De-Synchronising different CDGUs in a Power Station which, in the case of Coolkeeragh Power Station only, shall be stated for both paired and single CDGUs.	All CDGUs, except Aggregated Generating Units

Users should also refer to SDC1.4.5.2 for the submission of revised **Additional Grid Code Characteristics** data.

4. Reserve capability

Each **Generator** and **Generator Aggregator** shall submit reserve capability data in accordance with SDC1.4.4.3 and, in the case of **PPA Generation**, Appendix B to SDC1.

5. Other Relevant Data

For each **Plant** which has been declared **Available** in an **Availability Notice** (and, in the case of a **CCGT Installation**, **CCGT Modules** within):-

- (i) any newly arisen special factors which in the reasonable opinion of the **User** may have a material effect on the likely **Output** or **Demand Reduction** of such **Plant** (and, in the case of a **CCGT Installation**, **CCGT Modules** therein) or, in the case of an **Interconnector**, the **Availability** of the **Interconnector Filters**; and
- (ii) any temporary changes, and their likely duration, to the Registered Data of such **Plant** (and, in the case of a **CCGT Installation**, **CCGT Modules** therein) (other than those already notified under the foregoing provisions of this Part II of Schedule 2).

6. Commercial Offer Data

Each **Generator**, **Pumped Storage Generator** (in respect of **Pumped Storage Plant Demand**), **Interconnector User** (in respect of an **Interconnector Unit**), **Dispatchable Demand Customer** and **Generator Aggregator** shall submit **Commercial Offer Data** to the **TSO** (either directly or by means of an **Intermediary**) by **Gate Closure** for the following **Trading Day** in accordance with the **TSC**. Specific requirements for **Energy Limited Generating Units** and **Pumped Storage Plants** are listed in SDC1.4.4.5.