

## DGD

<b>Demand Facility</b>	An installation under the control of a <b>Customer</b> where electrical energy is consumed and is connected at one or more connection points to the <b>DNO's Distribution System</b> .
<b>Demand Services Provider</b>	A party who contracts with the <b>DNO</b> to provide a demand side service. The party might be a <b>Customer</b> contracting bilaterally with the <b>DNO</b> for the provision of services, or may be a third party providing an aggregated service from many individual <b>Customers</b> . In the latter case there will be a specific contract for the provision of the services to the <b>DNO</b> and will include compliance by that third party with the requirements of DPC9 in relation to each <b>Demand Unit</b> included in the aggregated service.
<b>Demand Unit</b>	<p>An appliance or a device whose <b>Active Power Demand</b> or <b>Reactive Power</b> production or consumption is being actively controlled by the Customer in whose Demand Facility it is installed and which has been commissioned on or after 9 September 2019 in pursuance of a contract to this end with the <b>DNO</b>. Such an appliance or device commissioned before this date, but which has been materially altered will also be included in this definition.</p> <p><b>Demand Units</b> of <b>Customers</b> where the <b>Customer</b> has concluded a final and binding contract for the purchase of a <b>Demand Unit</b> before 07 September 2018 are not included the scope of DPC9. The <b>Customer</b> must have notified the <b>DNO</b> of the conclusion of this final and binding contract by 07 March 2019.</p> <p>Any <b>Demand Unit</b> including storage, with the exception of a pumped storage <b>Power Generating Module</b>, as a component part is also excluded from the requirements of DPC9.</p>
<b>Manufacturers' Information</b>	Information in suitable form provided by a manufacturer in order to demonstrate compliance with one or more of the requirements of the Distribution Code. Where equipment certificate(s) as defined in EU 2016/631, or 2016/1388 cover all or part of the relevant compliance points, the equipment certificate(s) demonstrate compliance without need for further evidence for those aspects within the scope of the equipment certificate

## DISTRIBUTION PLANNING AND CONNECTION CODE 9

### DPC9 DEMAND SIDE SERVICES

#### DPC9.1 Scope

DPC9.1.1 This DPC9 applies to **Customers** in relation to their **Demand Units** that are providing any of the demand side services defined in DPC9.2. For the avoidance of doubt it does not apply to **Customers'** installations and **Equipment** in general.

DPC9.1.2 DPC9 also applies to **Demand Service Providers**.

#### DPC9.2 Demand Side Service Definitions

DPC9.2.1 **Active Power** control – a service where a **Customer** makes available the modulation by the **DNO** of **Demand** within the **Customer's Demand Facility**. This service can also be provided by a **Demand Service Provider** from a collection of **Demand Units** in various **Demand Facilities**.

DPC9.2.2 **Reactive Power** control – a service where a **Customer** makes available the modulation by the **DNO** of the **Customer's** reactive power production or consumption within the **Customer's Demand Facility**. This service can also be provided by a **Demand Service Provider** from a collection of **Demand Units** in various **Demand Facilities**.

#### DPC9.3 Technical Requirements

##### DPC9.3.1 Voltage Ranges

DPC9.3.1.1 Any **Demand Unit** must be able to remain connected and operating normally when the supply voltage is within the range of 0.90pu to 1.06pu of nominal declared voltage.

DPC9.3.1.2 Any **Demand Unit** must be able to remain connected and operating normally for up to 15 minutes when the supply voltage is within the range of 1.06pu to 1.10pu of nominal declared voltage.

##### DPC9.3.2 Frequency Ranges

DPC9.3.2.1 The **System Frequency** could rise to 52Hz or fall to 47Hz in exceptional circumstances. Any **Demand Unit** must be able to remain connected and operating normally in accordance with the following table:

<u>Frequency Range</u>	<u>Requirement</u>
47Hz - 47.5Hz	Operation for a period of at least 20 seconds is required each time the <b>Frequency</b> is below 47.5Hz.

47.5Hz - 49.0Hz	Operation for a period of at least 90 minutes is required each time the <b>Frequency</b> is below 49.0Hz.
49.0Hz - 51Hz	Continuous operation is required
51Hz - 51.5Hz	Operation for a period of at least 90 minutes is required each time the <b>Frequency</b> is above 51Hz.
51.5Hz - 52Hz	Operation for a period of at least 15 minutes is required each time the <b>Frequency</b> is above 51.5Hz.

DPC9.3.2.2 **Demand Units** must remain connected and operating normally for rates of change of frequency up to  $1\text{Hzs}^{-1}$ .

### DPC9.3.3 Modulation

DPC9.3.3.1 A **Demand Unit** or **Demand Units** must be capable controlling its **Demand** or **Reactive Power** production or consumption over the range specified in any contract with the **DNO**.

DPC9.3.3.2 **Demand Units** must be equipped to receive modulation instructions either directly, or indirectly via a **Demand Service Provider**, from the **DNO**.

- a) **DNOs** currently are developing active network management approaches and there is no common standard for communication protocols.
- b) The **DNO** will provide details of the method to be employed on a site by site basis, or as will be deployed between the **DNO** and the **Demand Service Provider**. Protocols currently in use between **DNOs** and **Customers** include simple current loop; DNP3; IEC 61850.
- c) The **DNO** will agree with the **Customer** for each **Demand Facility**, or with the **Demand Service Provider** as appropriate, the protocol to be used.
- d) By default if nothing is specified by the **DNO** then the interface will take the form of a simple binary output that can be operated by a simple switch or contactor. When the switch is closed the **Demand Unit** or **Demand Facility** can operate normally. When the switch is opened the **Demand Unit** will modulate its **Demand (Active Power consumption or Reactive Power production or consumption)** as required by the contract. The signal from the **Demand Unit** that is being switched can be either AC (maximum value 240 V) or DC (maximum value 110 V).

- DPC9.3.3.3 The **DNO** will publish the standard response times it expects for the services it wishes to contract for. Having received the signal or command from the **DNO** the **Demand Unit** will modulate its behaviour to the full extent of the contract within the standard response time, unless agreed otherwise with the **DNO**. In the absence of a specific published **DNO** requirement the response time will be 180 s.
- DPC9.3.3.4 The modulated behaviour will be maintained for the duration of the signal to do so from the **DNO** unless otherwise agreed with the **DNO**.
- DPC9.3.3.5 If the modulation, or any part of it, ceases to be fully available for operation at any time, either temporarily or permanently, the **Customer**, or **Demand Service Provider** as appropriate, will notify the **DNO** without delay, and no more than 12 hours after the modulation ceases to be fully available.
- DPC9.3.3.6 The **DNO** will advise what operational monitoring and/or metering is to be installed in a **Demand Facility**, or agreed with a **Demand Service Provider**. For **Demand Facilities** connected at **HV** the **DNO** in some cases will install the **DNO's** own telemetry which can form part of the necessary operational monitoring,

#### **DPC9.4 Operational Notification**

- DPC9.4.1 As part of the contractual arrangements for the provision of demand side services to the **DNO**, the **Customer** must provide the following information one month in advance of the commencement of a contract for demand side services:
- a) Full contact details of the **Demand Facility** owner.
  - b) The exact address and location of the **Demand Facility**;
  - c) The capacity of the modulated behaviour of the **Demand Unit** expressed in kW or kVAr (including production or consumption) as appropriate.
  - d) Confirmation that the **Demand Unit** complies with the technical and modulation requirements of DPC9.3
  - e) The name and contact details of the **Demand Service Provider** if the **Customer** has contracted with a **Demand Service Provider** for the provision of the demand side services.
  - f) For **Customers** providing demand side services via a **Demand Service Provider**, the information above should be submitted to the **Demand Service Provider**, who in turn will submit it to the **DNO** in aggregated form.
  - g) The above information must be submitted for each and every **Demand Unit**.
- DPC9.4.2 The above information, together with the statement of compliance required by DPC9.5.1.4 below shall be submitted by either the **Customer**, or **Demand**

**Services Provider** as appropriate, on the proforma provided by the **DNO** for that purpose.

- DPC9.4.3 The **Customer** or **Demand Services Provider** must notify the **DNO** of any planned change or modification to the capabilities of the **Demand Unit** at least one month in advance, unless agreed otherwise with the **DNO**.
- DPC9.4.4 The **Customer** or **Demand Services Provider** must notify the **DNO** of any unplanned incident or failure of a **Demand Unit** immediately, which means within the same day unless otherwise agreed with the **DNO**.
- DPC9.4.5 In the case of an aggregated service, the **Demand Service Provider** must notify the **DNO** of any planned changes to the specification and availability of the contracted service at least one month in advance of the planned implementation date.
- DPC9.4.6 In the case of an aggregated service, any unplanned incident or failure of the contracted service should be notified to the **DNO** immediately, which means within the same day.
- DPC9.4.7 For any **Demand Facility** connected at **HV**, the demand side services cannot be called upon until the **DNO** has issued a final operational notice to the **Customer** responsible for the **Demand Facility**. The **DNO** will issue the final operational notice to the customer on receipt of the complete information required in DPC9.4.1. The **DNO** will recognize practical difficulties in completing all appropriate tests for confirmation of compliance in specific situations and will not unreasonably withhold the issuing of the final operation notification.

## **DPC9.5 Compliance**

- DPC9.5.1 Where the **Customer** has a direct contract with the **DNO**:
  - DPC9.5.1.1 Where a **Customer** has contracted directly with the **DNO** for demand side services, the **Customer** is wholly responsible for the compliance of the **Customer's Demand Units** with the requirements of this DPC9 and for the conduct of any tests necessary to demonstrate compliance.
  - DPC9.5.1.2 The **Customer** must demonstrate the modulation of behaviour of the **Demand Unit** on receipt of the appropriate signal (or simulated signal) from the **DNO**. Where appropriate such tests can be undertaken off site, for example by the manufacturer.
  - DPC9.5.1.3 To the extent that the **Customer** requires the **DNO** to assist or participate in compliance testing the **DNO** will co-operate to achieve an agreed timetable.
  - DPC9.5.1.4 The **Customer** will supply to the **DNO** a statement of compliance detailing how compliance with the relevant parts of DPC9 has been demonstrated. The statement can include **Manufacturer's Information** to support the demonstration of compliance.

- DPC9.5.2 Where the **DNO** has contracted with a **Demand Service Provider** who is not a single **Customer** and is aggregating a response from more than one **Customer**:
- DPC9.5.2.1 Where the **DNO** has contracted with a **Demand Service Provider** it is the responsibility of that **Demand Service Provider** to ensure that relevant **Demand Units** comply with DPC9 and are also responsible for any necessary tests etc needed to demonstrate compliance.
- DPC9.5.2.2 The **Demand Service Provider** must demonstrate the modulation of behaviour of **Demand Units** on receipt of the appropriate signal (or simulated signal) from the **DNO**. Where appropriate such tests can be undertaken off site, for example by the manufacturer and aggregated by the **Demand Service Provider** .
- DPC9.5.2.3 To the extent that the **Demand Service Provider** requires the **DNO** to assist or participate in compliance testing the **DNO** will co-operate to achieve an agreed timetable.
- DPC9.5.2.4 The **Demand Service Provider** will provide a statement of compliance detailing how the **Demand Service Provider** has ascertained that the **Demand Units** that it is using to provide demand side services to the **DNO** are compliant with the requirements of this DPC9.
- DPC9.5.3 The **DNO** may require the **Customer** or **Demand Service Provider** to repeat compliance tests in accordance with a plan, or following any modification or failure of the **Demand Unit** to perform as required.