

# Stage 02: Workgroup Consultation

## Grid Code

# GC0104: EU Connection Codes GB Implementation – Demand Connection Code

What stage is this document at?

02	Workgroup Consultation
03	Workgroup Report
04	Code Admin Consultation
05	Draft Final Modification Report
06	Report to the Authority

### Purpose of Modification:

This modification will set out within the Grid and Distribution Codes the following compliance obligations in the European Network Code – Demand Connection Code (DCC):

1. Technical requirements for new\* Transmission-connected Demand Facilities; Transmission-connected Distribution Facilities and Distribution Systems.
2. Technical requirements for Demand Units used by a Demand Facility or a Closed Distribution System to provide Demand Response Services to System Operators.

\* 'New' is defined as not being connected to the system at the time that the code enters into force and not having concluded a final and binding contract for the purchase of main plant items by two years after entry into force.

This document contains the discussion of the Workgroup which formed in September 2017 to develop and assess the proposal. Any interested party is able to make a response in line with the guidance set out in Section 10 of this document.

**Published on:** 08 March 2018

**Length of Consultation:** 15 working days

**Responses by:** 29 March 2018



**High Impact:** Transmission System Operators (TSOs), Transmission Connected Demand Facilities, Demand Facilities providing DSR, Aggregators and Directly Connected Transmission Facilities; Distribution Network Operators



**Medium Impact:** Operators of Demand schemes considering modernisation.



**Low Impact:** None identified

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### Any Questions?

Contact:

**Chrissie Brown**

Code Administrator



[christine.brown1](mailto:christine.brown1@nationalgrid.com)

[@nationalgrid.com](mailto:christine.brown1@nationalgrid.com)



01926 65 3328

Proposer:

**Rachel Woodbridge-**

**Stocks – NGET SO**

## Timetable

The following timetable has been set by the Grid Code Panel:

Workgroup Meeting 1	06 September 2017
Workgroup Meeting 2	06 December 2017
Workgroup Meeting 3	23 January 2018
Workgroup Meeting 4	7 February 2018
Workgroup Consultation open/closes	8 March 2018/29 March 2018
Workgroup Meeting 5 & 6	TBC
Workgroup meeting 7	TBC
Workgroup Report issued to the Grid Code Panel	18 April 2018
Workgroup Report presented to Panel	26 April 2018

Code Administration Consultation Report issued to the Industry/Code Administrator Consultation closes	30 April 2018/22 May 2018
Draft Final Modification Report presented to Panel	20 June 2018
Modification Panel decision	28 June 2018
Final Modification Report issued the Authority	11 July 2018
Authority Decision	15 August 2018
Decision implemented in Grid Code	30 August 2018

## About this document

This document is a Workgroup consultation which seeks the views of Grid Code and interested parties in relation to the issues raised by the Original GC0104 Grid Code Modification Proposal which was raised by National Grid Electricity Transmission and developed by the Workgroup. Parties are requested to respond by **5pm on 29 March 2018** to [grid.code@nationalgrid.com](mailto:grid.code@nationalgrid.com) using the Workgroup Consultation Response Proforma which can be found on the following link:

<https://www.nationalgrid.com/uk/electricity/codes/grid-code/modifications/gc0104-eu-connection-codes-gb-implementation-demand>

## Document Control

Version	Date	Author	Change Reference
0.1	02 February 2018	Code Administrator	Draft Workgroup Consultation to Workgroup
0.2	06 March 2018	Workgroup	Draft Workgroup Consultation to Workgroup
0.3	08 March 2018	Workgroup	Workgroup Consultation to Industry

## 1 Summary

- 1.1 This report aims to outline the discussions had by the Workgroup in respect of its scope; set out the proposals to address the solution from the Proposer and possible alternative options, and provide supporting justification respectively.
- 1.2 GC0104 was proposed by National Grid and was submitted to the Grid Code Review Panel for their consideration on 16 August 2017 and the Distribution Code Review Panel 7 September 2017.
- 1.3 The Grid Code Review Panel decided to send the Proposal to a Workgroup to be developed and assessed against the Grid Code Applicable Objectives.

- 1.4 Section 2 (Original Proposal) and Section 6 (Proposer's solution) are sourced directly from the Proposer and any statements or assertions have not been altered or substantiated/supported or refuted by the Workgroup. Section 8 of the Workgroup contains the discussion by the Workgroup on the Proposal and the potential solution.
- 1.5 The Grid Code and Distribution Code Review Panels detailed in the Terms of Reference the scope of work for the GC0104 Workgroup and the specific areas that the Workgroup should consider. This can be found in Annex 4.
- 1.6 Please note that the draft legal text that can be found in Annex 2 has been sourced from the Grid Code Modifications GC0100, 101 and 102 (the Original proposals and not the alternatives proposed) that propose to amend the Grid Code to comply with the EU Codes RfG (Requirement for Generators) and HVDC (High Voltage Direct Current Connections). A decision is due from the Authority in March 2018 on the GC0100, 101 and 102 modifications ahead of submission of this GC0104 modification to the Authority. Should the Authority approve one of the alternatives proposed for GC0100 or GC0102 that have been submitted this would not affect the GC0104 legal text, there are no interdependencies between GC0104 legal text and alternatives proposed to GC0100 and GC0102.
- 1.7 The requirements outlined in the proposed draft legal text for this GC0104 Workgroup Consultation document have been created in the European Compliance Processes and European Connection Conditions that were created for Modification GC0102 (EU Connection Codes GB Implementation – Mod 3). You will also note that the draft legal text for GC0104 also has an additional new section called DRSC so customers that are not Users and bound by the Grid Code only have to look at this one section.
- 1.8 GC0104 is made up of two elements, the Transmission-Connected Demand and the compliance for it and Demand Response Requirements and compliance for it.

## 2 Original Proposal

***Section 2 (Original Proposal) is sourced directly from the Proposer and any statements or assertions have not been altered or substantiated/supported or refuted by the Workgroup. Section 8 of the Workgroup Consultation contains the discussion by the Workgroup on the Proposal and the potential Solution.***

### ***What***

Full sections of the Grid and Distribution Codes, for example the Grid Code Connection Conditions (CCs), Planning Code (PC) and the Distribution Code (Distribution Planning and Connection Code (DPC)) will need to be extended to set out the new EU standards to which impacted users will need to comply with. In addition it is proposed to add a new section to the Grid Code to cater for Demand Response Services which will be called the Demand Response Services Code (DRSC), and a new section, DPC9, to the Distribution Code solely for demand response.

This will result in a combination of completely new requirements inserted into the Grid Code and Distribution Code, and adjustments/continuation of corresponding existing GB requirements to line up with equivalents in the new EU codes.

### ***Why***

Guidance from BEIS and Ofgem<sup>1</sup> was to apply the new EU requirements within the existing GB regulatory frameworks. This would provide accessibility and familiarity to GB parties, as well as putting in place a robust governance route to apply the new requirements in a transparent and proportionate way.

This modification needs to be undertaken in a timely manner to ensure impacted users are aware of their compliance obligations - particularly in relation to procurement of equipment, testing and operational requirements. This modification is also therefore, critical to facilitate/demonstrate Member State compliance to this EU Network Code.

### ***How***

With the support of the industry, we will use this modification to finalise proposals to apply the EU Connection Codes requirements in DCC, before consulting with the wider industry and submitting to Ofgem for a decision.

Previously, a Joint Grid and Distribution Code Review Panel issue group was formed (GC0091) to:

1. Comprehensively review the code to form a local interpretation of the DCC requirements;
2. Undertake a mapping exercise between the EU and GB codes to understand the extent for possible code changes;
3. Form proposals, which will now be taken forward as formal modifications.

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<sup>1</sup> <https://www.ofgem.gov.uk/ofgem-publications/92240/openletteronencimplementationandconsultationonmodesignation-pdf>  
Ofgem's 2014 guidance letter on ENC implementation

### 3 Governance

Given the complexity and wide-ranging impact of the changes proposed in this modification, the Proposer believed that self-governance or fast track governance arrangements was not appropriate for GC0104.

The Grid and Distribution Code Review Panels agreed that this modification would have a material affect and as a result the modification will be submitted to the Authority for decision.

## 4 Why Change?

This proposal is one of a number of proposals which seek to implement relevant provisions of a number of new EU Network Codes/Guidelines which have been introduced in order to enable progress towards a competitive and efficient internal market in electricity.

The full set of EU network guidelines are;

- Regulation 2015/1222 – Capacity Allocation and Congestion Management (CACM) which entered into force 14 August 2015
- Regulation 2016/1719 – Forward Capacity Allocation (FCA) which entered into force 17 October 2016
- *Regulation 2016/631 - Requirements for Generators (RfG) which entered into force 17 May 2016*
- **Regulation 2016/1388 - Demand Connection Code (DCC) which entered into force 7 September 2016**
- *Regulation 2016/1447 - High Voltage Direct Current (HVDC) which entered into force 28 September 2016*
- Transmission System Operation Guideline (SOGL) which entered into force 14 September 2017
- Emergency and Restoration (E&R) Guideline – entered into force 18 December 2017
- European Balancing Guideline (EBGL) – entered into force 18 December 2017

The DCC was drafted with the objective to improve security of supply; and enhance competition to reduce costs for end consumers, across EU Member States.

The DCC specifically sets harmonised technical standards for the connection of new transmission-connected demand facilities, new transmission-connected distribution facilities and new distribution systems, including new closed distribution systems. It also addresses the performance requirements for new demand units used by a demand facility or a closed distribution system to provide Demand Response to relevant system operators or relevant TSOs. Demand Response is an important instrument for increasing the flexibility of the internal energy market and for enabling optimal use of networks. Historically, generation facilities have formed the backbone of providing technical capabilities to System Operators. However, Demand Facilities are expected to play a more pivotal role in the future.

Significant work to progress GB understanding of the DCC has been undertaken in Grid Code and Distribution Code Review Panel issue group GC0091 and allowed GB stakeholders to engage with the European Code drafting process as led by ENTSO-E. The GC0091 Workgroup was replaced by the GC0104 modification proposal.

GC0091 was widely attended by a range of parties and additional stakeholder engagement has been undertaken to ensure the impacts of DCC is understood, as well as to provide an opportunity to feed into the implementation approach.

Through proposing these modifications under Grid Code Open Governance (rather than continue with GC0091 which was raised under previous Grid Code governance arrangements), the aim is to finalise the proposals in a timely manner; and undertake the necessary consultations to confirm the proposals are appropriate, before submitting the final modification report to Ofgem for a decision.



## 5 Code Specific Matters

The Technical skillsets that have been outlined below were provided by the Proposer when the modification was originally raised.

The Proposer, Workgroup and Panel have concluded that they have a cross set of members that represent the skillset required as per the below.

### ***Technical Skillsets***

- Understanding of the GB regulatory frameworks (particularly Grid Code and Distribution Code)
- High level understanding of the EU codes and their potential impact
- Operational/technical understanding of equipment/facilities /systems which is bound by DCC
- Where appropriate, knowledge of the obligations and operational processes of GB Network Operators and the GB National Electricity Transmission System Operator

### ***Reference Documents***

Demand Connection Code legal text:

<http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R1388&from=EN>

***Section 5 (Solution) is sourced directly from the Proposer and any statements or assertions have not been altered or substantiated/supported or refuted by the Workgroup. Section 8 of the Workgroup Consultation contains the discussion by the Workgroup on the Proposal and the potential Solution***

The solution will ensure that the Grid and Distribution Codes reflect the technical requirements set out in DCC for GB compliance of code users with EU legislation. NGET is proposing to retain the existing Grid Code text as applicable to Demand Users, unless there is a conflict with the DCC requirements, or the DCC requirements require new additions which are not reflected in the current GB Grid Code.

**GC0091 identified the specific changes necessary to the Grid and Distribution Codes by undertaking a code mapping exercise. The areas of change are highlighted below:**

- Connection requirements affecting new connection of transmission-connected demand facilities, transmission-connected distribution facilities and distribution systems
- Operational notification procedure for new connection of transmission-connected demand facilities, transmission-connected distribution facilities and distribution systems
- Technical requirements of new Demand Units used by a Demand Facility or a Closed Distribution System to provide Demand Response Services to System Operators
- Operational notification procedure for new Demand Units used by a Demand Facility or a Closed Distribution System to provide Demand Response Services to System Operators
- Compliance procedures and requirements: testing, simulations, and monitoring

GC0091 and its subsequent work under GC0104 will address only the technical requirements of DCC.

For the purposes of this consultation the following principles have been adopted:

- i) Retain the same structure and format as the current GB Grid and Distribution Codes.
- ii) Retain the current requirements of the GB Grid and Distribution Codes unless there is good reason not to do so – for example there is either a conflict between the EU Codes and the GB codes or the EU Code requires additions to the GB Codes.
- iii) Ensure that the revised GB Codes are easy to understand and use by those parties affected by them.
- iv) Ensure consistency between the Grid and Distribution Codes and associated industry documents.

Following these principles, NGET is building on the new sections of the Grid Code Connection Conditions called the “European Connection Conditions” (ECC’s) and “European Compliance Processes” (ECP) created via GC0102, as well as existing sections of the Grid Code. This provides a solid foundation upon which to define the EU Connection Codes and implementation of DCC (through GC0104) will easily slot into the format adopted for the RfG and HVDC Codes. These sections apply to EU Code Users who must meet the requirements of the European Codes and ensure consistency between the GB Code and European Code without Users having to refer to two separate documents (i.e. the GB Grid Code and EU Connection Codes). The baseline legal text for GC0104 is established on the Grid Code legal text proposed in the original solution of GC0102 – GC0104 should reach code administrator consultation in April, at which point it is likely Ofgem will have made a decision on GC0102 (the Alternative solutions in GC0102 do not materially affect the solution in GC0104).

NGET is also proposing as part of GC0104, the introduction of a new section of the Grid Code, Demand Response Services Code (DRSC), to facilitate the DCC requirements relating to Demand Response Services.

Similarly, and as there is very little current accommodation of demand side response in the Distribution Code, a new section of the Distribution Code, DPC9, has been drafted as the repository of DSR issues for DCC compliance.

To accompany the legal text and illustrate how the DCC requirements have been discharged in GB, a code mapping table has been produced and is available at the time of this consultation. The sections below provide a high level overview of the proposal and the code mapping table along with the legal text provide the detail.

Articles 1-11 cover the scope of the DCC, including definitions and form part of this modification.

### **Glossary and Definitions**

In general NGET will treat the DCC definitions of Transmission Connected Demand Facility and Transmission Connected Demand User as the GB definition Non-Embedded Customer. The DCC definition Transmission Connected Distribution System will be treated as a Network Operators System which is already an established GB Grid Code definition.

There was some debate around how Grid Supply Points (GSPs) would be treated and defined, particularly existing GSPs that were modified to the extent that they became defined as an EU GSP (i.e. required to comply with DCC) and the effect this would have on corresponding facilities/systems (e.g. a distribution network or a demand facility).

The proposal is to treat a GSP as its own entity, for example if an existing DNO upgrades a GSP to the point it becomes defined as an EU GSP, in DCC terms the GSP would be considered as a Distribution Facility and the requirements that apply to distribution facilities would apply to that single GSP.

In the context of a Distribution Facility (e.g. a demand provider connected to the transmission system), the GSP would be treated as a single entity but in this case would be applicable to the Demand Facility definition of DCC.

These requirements have been incorporated into the Grid Code so the User would not be required to consult the DCC.

## **Connection requirements affecting the connection of new transmission-connected demand facilities, transmission-connected distribution facilities and distribution systems**

### **This section relates to the following articles:**

- General frequency requirements (Article 12)
- General voltage requirements (Article 13)
- Short-circuit requirements (Article 14)
- Reactive power requirements (Article 15)
- Protection requirements (Article 16)
- Control requirements (Article 17)
- Information Exchange (Article 18)
- Demand disconnection and demand reconnection (Article 19)
- Power Quality (Article 20)
- Simulation Models (Article 21)

### **Article 12 – General Frequency Requirements**

Lists the frequency ranges and time periods demand equipment must be capable of remaining connected to the Transmission System. Longer timescales and frequency ranges can be agreed.

The general frequency requirements in DCC are very similar to those currently in the Grid Code and result in no significant change to the current GB text.

As the frequency requirements for distribution customers are quoted in G99 (and G98) for generators, text will be introduced in DPC9 that explains the frequency requirements for distribution connected DSR providers.

### **Article 13 – General Voltage Requirements**

Lists the voltage ranges and time periods demand equipment must be capable of remaining connected to the Transmission System. Longer timescales and voltage ranges can be agreed.

The general voltage requirements in DCC are more or less the same as those currently in the Grid Code though it is pertinent to note that under the current GB Grid Code, voltage ranges of  $\pm 10\%$  are permitted at 132kV and  $\pm 6\%$  at voltages below 132kV. Under DCC (and also RfG) the range of  $\pm 10\%$  applies down to nominal voltage levels of 110kV but this issue is not believed to cause any significant issues in GB due to the lack of equipment in the 110 – 132kV range. For HV equipment below 110kV, the current range of  $\pm 6\%$  shall continue to apply as per current GB practice.

Text has been introduced into DPC9 that makes it clear what voltage ranges distribution connected DSR providers have to comply with.

#### **Article 14 - Short Circuit Requirements**

Article 14 of DCC contains requirements in respect of Short Circuit Requirements at Transmission Connection Points.

During the drafting process, it was agreed and accepted that current GB practice can continue to apply unchanged without causing a conflict with the Short Circuit Requirements in DCC.

#### **Article 15 - Reactive Power Requirements**

This defines the requirement for Demand Facilities and Distribution Systems to be capable of maintaining steady-state operation at their connection point within a specified reactive power range and lists a number of conditions to follow.

These requirements are not currently in the Grid Code and as such the legal text from Article 15 will be added into the ECC section of the Grid Code.

It has been noted that as Article 15 doesn't apply to a Distribution Facility, if an Existing DNO was to significantly modify their GSP, the significantly modified GSP would not be required to meet the Reactive Power Requirements set out in Article 15.

#### **Article 16 – Protection Requirements**

This article focusses on the protection requirements at the connection point and goes on to list the high level elements necessary. These requirements in DCC are similar to those in the RfG and HVDC Codes which were implemented via GC0102. As such, of the changes introduced to the legal text, they are simply clarifications to the existing GB text with amendments added to ensure consistency with DCC and also to provide clarity on changes to protection settings which traditionally have been included in the Bilateral Connection Agreements.

#### **Article 17 - Control Requirements**

This article focusses on the schemes and settings of control devices that are necessary for system security and goes on to list a number of elements that must be covered as a minimum in the agreement with the TSO.

In general these requirements are similar to those in RfG and HVDC. However to ensure consistency with DCC, the GB legal text has been updated to ensure the specific elements in DCC are added to this section and where necessary are referred to in the Bilateral Connection Agreement.

#### **Article 18 - Information Exchange**

The TSO must specify the standards required for information exchange between itself and distribution facilities/system owners/operators, who must adhere to these requirements.

In summary the requirements in DCC are very similar to current GB practice. Under the current GB Grid Code the requirements for operational metering are covered under CC.6.5.6 with the exact list of signals being covered under the

Bilateral Connection Agreement together with the refresh rates. At the present time National Grid does not publish the standards for information exchange however it is planned to address this by the introduction of a new Electrical Standard which will be referenced in the Annex to the General Conditions. Changes to the RES will occur alongside, but not as part of, this modification.

## **Article 19 - Demand Disconnection and Reconnection**

### *Low Frequency Demand Disconnection (LFDD)*

Low Frequency Demand Disconnection Schemes have been employed in various Grid Systems throughout the world. In general, Transmission Systems are designed to a security standard which defines the level of robustness for a range of credible Transmission System faults for which supplies would not be lost.

LFDD Schemes are designed as a final insurance/defence plan to protect the total system in the event of a sequence of events that go beyond the security criteria. Their aim is to disconnect loads as system frequency falls, normally in defined stages below the minimum frequency criteria defined in the security standard. Whilst demand, will be lost its purpose is to protect the overall integrity of the system without the need for a full black start process to be initiated.

In GB a low frequency demand disconnection scheme has been in operation for many years. LFDD relays are installed at various points across the Total System (i.e. at points on the Transmission System and within the DNO Networks) not just at Grid Supply Points with the first stage of disconnection commencing at 48.8Hz and then subsequent stages operating at lower frequencies until 47Hz when all the LFDD relays will have operated. In GB, by the time the frequency has dropped to 47Hz all the LFDD relays will have operated to the point where 60% of total demand will have tripped.

The requirements for low frequency demand disconnection in GB are very similar to those in DCC and therefore very few changes are required to this section of the Grid Code other than in respect of the need to add the direction of Active Power flow. This amendment has been made to the draft legal text.

### *Low Voltage Demand Disconnection (LVDD)*

Similar to Low Frequency Demand Disconnection, Low Voltage Demand Disconnection achieves reductions in demand through demand disconnections where the voltage drops below a pre-defined threshold. Additional measures can be put in place such as blocking the operation of tap changers on transformers.

In GB there is no LVDD scheme although it was investigated as an option in 2001. Under DCC, low voltage demand disconnection is a non-mandatory requirement and it is therefore proposed not to introduce it in this modification. Essentially, whilst DCC doesn't state we need LVDD schemes, it does specify the requirements necessary should it be introduced.

Low voltage demand disconnection at new sites only is likely to be of limited benefit for the System. To be effective, LVDD needs to be consistently applied

across the whole system and therefore would need to be addressed as a separate GB work group.

It has been recognised that should low voltage demand disconnection be introduced into GB in the future, it would need to be introduced via the GB Grid Code Governance process and would need to be consistent with the requirements of DCC in respect of new sites only and the fundamental principles of the DCC would need to be reflected in any future GB legal drafting.

### **Article 20 - Power Quality**

Article 20 of DCC covers the level of distortion and fluctuation in supply voltage at Grid Supply Points. In summary this relates to the tolerable level of harmonics, flicker and unbalance at each Grid Supply Point.

The GB Grid Code already covers these elements in CC.6.1.5, CC.6.1.6 and CC.6.1.7. As a consequence there is no need to change these requirements and the proposal is simply to apply copy these requirements across into the ECC's.

### **Article 21 - Simulation Models**

In order to design and operate the Transmission System, it is an essential requirement that true and accurate models of the plant as built are submitted to National Grid and Network Operators. Under the Grid Code Planning Code, data models are already required to be provided by Network Operators and Non-Embedded Customers for this very purpose.

Most of the data required for demand modelling purposes is already covered in the Grid Code planning code; however the Planning Code has been updated to ensure consistency with DCC.

### **Operational notification procedure for new connection of transmission-connected demand facilities, transmission-connected distribution facilities and distribution systems**

**The following articles of DCC detail the operational notification procedure for complying with the technical requirements listed in articles 12-21:**

- General provisions (Article 22)
- Energisation Operational Notification (Article 23)
- Interim Operational Notification (Article 24)
- Final Operational Notification (Article 25)
- Limited Operational Notification (Article 26)

### **Article 22 – General Provisions**

DCC States that if any of the requirements in Articles 12-21 apply to a demand facility or system, they must follow the operational notification procedure to show the TSO they are compliant.

The Compliance Processes section of the Grid Code outlines the general compliance process for generation and demand. It is however true to say that the Compliance Processes section within the current GB Grid Code is largely biased

towards generation. Due to the requirements in DCC, it is necessary to update the European Compliance Processes section of the code (as developed under GC0102) to specifically capture the compliance processes applicable to transmission connected demand at new sites, which traditionally have only been previously completed through the commissioning process. This applies to articles 23 – 26.

To summarise, the notifications below are currently well established for Generators, however, as it stands in GB currently, only the EON applies to demand. DCC introduces these notifications as mandatory for new demand connections to the transmission network so most of the articles below can be considered as new requirements.

### **Article 23 - Energisation Operational Notification (EON)**

An EON allows the demand facility owner or DNO to energise its internal network and auxiliaries by using the transmission connection specified for the connection point. In essence this is the same as the EON that would apply to a Generator where the User's plant and Apparatus is connected to the Transmission System for the first time. This activity is completed at the Commissioning Stage and takes place once all the pre checks are complete such as relevant data and site responsibility schedules etc. In England and Wales the commissioning process is carried out under the RES.

### **Article 24 - Interim Operational Notification (ION)**

As defined under the DCC an ION allows the demand facility owner or DNO operate using the transmission connection for a limited period of time.

Article 24 lists a number of items the TSO can request with regard to the data and study review for an ION. These include, for example, an itemised statement of compliance, detailed data submission, equipment certificates (as applicable where these are relied upon as a statement of compliance, simulation models, simulation studies and the approach to compliance testing.

In the case of a Generator, the EON is issued to allow a connection to the Transmission System and hence energise systems / auxiliaries whereas the ION enables synchronisation for the first time.

In the case of demand it is anticipated that the EON and ION will most likely be issued at the same time, as DCC Articles 12 – 21 relate to transmission connected demand or which most aspects are covered at the commissioning stage.

### **Article 25 - Final Operational Notification (FON)**

Under DCC, a FON allows the Transmission Connected entity, be this a DNO or Non Embedded Customer, to operate its demand connection at the Connection Point. Putting this another way it is effectively a statement issued by National Grid confirming that the Network Operator or Non Embedded Customer has satisfied the requirements of the Grid Code and Bilateral Connection Agreement and the data provided is a true and accurate reflection of the plant as built. The issue of a FON will be dependent upon the submission of all necessary data associated with the connection – for example the final statement of Compliance, updated technical



data, simulation models, studies and validation of test results against submitted models.

### **Article 26 - Limited Operational Notification (LON)**

Under DCC where a demand facility owner or DNO who has received a FON, they must notify the TSO under certain circumstances specified in Article 26 – for example their plant is temporarily subject to a significant modification or loss of capability affecting its performance or equipment failure leading to non-compliance. Under these circumstances the Network Operator or Non-Embedded Customer will be required to apply for a LON if the issue persists for more than three months.

The LON in many ways applies similar conditions as the ION, with issues such as unresolved issues being identified and the time period required for resolution. Should these issues remain unresolved then an application for a derogation can be sought.

### **Technical requirements of new Demand Units used by a Demand Facility or a Closed Distribution System to provide Demand Response Services to System Operators**

#### **The following areas of modification affect Connection requirements of new Demand Units used by a Demand Facility or a Closed Distribution System to provide Demand Response Services to System Operators:**

The general provisions for Demand Response are covered in DCC Article 27. It is important to note that these requirements are not mandatory unless a party wishes to provide Demand Response and a contract has been agreed with the System Operator (i.e. National Grid or a DNO) The general provisions for Demand Response are listed below.

- Specific provisions for demand units with demand response active power control, reactive power control and transmission constraint management (Article 28)
- Specific provisions for demand units with demand response system frequency control (Article 29)
- Specific provisions for demand units with demand response very fast active power control (Article 30)

There were numerous discussions around the correct vehicle to facilitate these new requirements as they do not currently exist in the GB frameworks. For example, a party who offers to provide a Demand Response Service need not necessarily be a CUSC party and obliged to meet the requirements of the Grid Code. After discussing this issue with the workgroup and presenting it at both the Power Responsive Flexibility Forum in January 2018 and the 2018 C16 workshop, feedback was requested from stakeholders and customers. The advantages and disadvantages of the options were presented and circulated to the Workgroup for their comment and feedback. The decision was between putting the requirements in Standard Contract Terms (and the categories stated in C16) or putting the requirements in the Grid Code. The table circulated to the workgroup is shown in Annex 1 and summarises the advantages and disadvantages of both options.

Following these presentations and discussions, the majority of industry parties favoured the requirements to go into the Grid Code, however, those in favour of the standard contract terms option stated they were concerned that the requirements would not be easily found and so the proposed solution is to create a separate and standalone section in the Grid Code for these requirements (and the corresponding compliance) which customers will be directed to via their contract. The Grid Code will therefore be updated in line with this view and a new section of the Grid Code will be introduced entitled Demand Response Services Code.

It is important to note that those parties who offer demand response services will still need to comply with the C16 process and the standard contract terms, however the technical and compliance requirements of DCC will lie in the Grid Code and the Standard contract terms will refer to these requirements as a condition of the contract. For the avoidance of doubt, parties who offer demand response services need only to satisfy the requirements of this new section of the Grid Code alone (i.e. the Demand Response Services Code), they do not need to satisfy other sections of the Grid Code unless either referred to in the Demand Response Services Code, as a condition of the Standard Contract Terms or if they are User's and hence CUSC parties in their own right.

#### **Article 27 – General Provisions**

Five categories are listed that demand services must be grouped into (although DCC states that these are not exclusive and so other categories can be developed). The five categories listed are:

Remotely controlled:

- Demand response active power control;
- Demand response reactive power control;
- Demand response transmission constraint management.

Autonomously controlled:

- Demand response system frequency control;
- Demand response very fast active power control.

In summary these requirements are new to the Grid Code and will be added to the Demand Response Services Code.

Distribution companies do not manage system frequency so DNOs will not be procuring Demand Response System Frequency Control or Demand Response Very Fast Active Power Control. There is therefore no accommodation needed in Distribution documents for these services nor is accommodation for Demand Response Transmission Constraint Management required.

#### **Article 28 - Specific provisions for demand units with demand response active power control, reactive power control and transmission constraint management**

Demand units providing the services specified in this article must meet certain technical requirements, including the capability to operate across the frequency ranges specified, be equipped to receive instructions, and be capable of controlling power consumption from the network, to name a few examples. Again these are new requirements and will be added to the Demand Response Services Code.

This section does require the specification of certain technical parameters such as rate of change of frequency. The proposal is to set this at 1Hz/s over a 500ms timeframe which would be consistent with that for Generators as defined under GC0101. For connections below 110kV, the same demand response requirements would apply to connections at 110kV or above whilst noting that such parties are expected not to be Users as defined under the Grid Code and therefore not subject to the full Grid Code requirements.

In the Distribution Code, the technical requirements of Art 28 are all new and have been added to the new requirements of DPC9.

#### **Article 29 - Specific provisions for demand units with demand response system frequency control**

Demand units providing frequency control must meet certain technical requirements, including the capability to operate across the frequency and voltage ranges specified, be equipped with a controller that measures the actual system frequency, and be capable of detecting a change in system frequency of 0.01 Hz, to name a few examples. These requirements only apply if the party wishes to offer these services and will be added to the Demand Response Services Code as a new item.

This section does require the definition of certain technical parameters such as deadband and control system functionality. It is proposed to adopt the same requirements as that applied to Generation. In the case of deadband it is proposed to set this to  $\pm 0.015\text{Hz}$ , The maximum frequency deviation requirements will be based on a proportional control such that the wider the frequency deviation the greater the response provided until a cap is reached which would be subject to the availability of the demand response service. All other requirements would be as per Article 29 of DCC.

For connections below 110kV, the same demand response requirements would apply to connections at 110kV or above whilst noting that such parties are expected not to be Users as defined under the Grid Code and therefore not subject to the full Grid Code requirements.

#### **Article 30 - Specific provisions for demand units with demand response very fast active power control**

The relevant system operator may agree on a contract with demand units providing very fast active power control. If they do, it must include the response time, a change of active power related to a measure and the operating principle of the control system.

In summary such requirements would be pursuant to the terms of the Contract with National Grid. The new Demand Response Services Code has been updated to include this requirement as a non-mandatory service

### **Operational notification procedure for new Demand Units used by a Demand Facility or a Closed Distribution System to provide Demand Response Services to System Operators**

**The following articles of DCC detail the operational notification procedure for complying with the technical requirements listed in articles 27-30:**

- General provisions (Article 31)
- Procedures for demand units within a demand facility or a closed distribution system connected at a voltage level of or below 1000 V (Article 32)
- Procedures for demand units within a demand facility or a closed distribution system connected at a voltage level above 1000 V (Article 33)

#### **Article 31 – General provisions**

Article 31 sets out the provisions demand unit owners must adhere to and specifies that the operational notification procedure differs for connections above a voltage level of 1000V and those at or below 1000V.

All these requirements are new and will therefore be added to the Demand Response Services Code which is a new non mandatory section of the Grid Code applying only to Demand Response providers.

#### **Article 32 - Procedures for demand units within a demand facility or a closed distribution system connected at a voltage level of or below 1000 V**

It is specified that the operational notification will be in the form of an installation document and that a template shall be provided by the relevant system operator. It goes on to list a number of items that must be included in this installation document for example the location of connection, maximum capacity, type of demand response service, Equipment Certificates / Demand Unit Certificate or equivalent information and contact details.

Again these will be new elements added to the Demand Response Services Section of the Grid Code.

For embedded customers, DNOs will publish standard proformas, and supporting information, for users complete as installation documents. A draft of the proposed standard approach is included as in this consultation.

#### **Article 33 - Procedures for demand units within a demand facility or a closed distribution system connected at a voltage level above 1000 V**

It is specified that the operational notification will be in the form of a Demand Response Unit document (DRUD). The contents will include a statement of compliance (in relation to articles 36 to 47) and will lead to a FON.

These will be new elements added to the Demand Response Services Section of the Grid Code.

So far the DNOs have not identified any specific DSR related issue that is differentiated between LV and HV. Accordingly the proformas suggested for discharge of Article 32 are believed to be appropriate and adequate to use for compliance with the DRUD requirements of Article 33.

## **Compliance**

The purpose of the Compliance section is to ensure that the plant built is fully capable of meeting the requirements specified in DCC. Compliance is a key method of ensuring the data and models provided reflect the true and accurate performance of the equipment as built, this being a fundamental prerequisite for the design and operation of the System going forward.

Compliance covers three main areas. These are summarised as follows:-

- i) The Compliance Process (i.e. the process by which parties demonstrate their plant can meet the requirements of the codes)
- ii) Simulation (the submission of plant performance based on simulations)
- iii) Testing (Plant testing - validation of actual test results against simulated results)

### **The following articles of DCC relate to compliance:**

#### **Article 34 – Responsibility of the demand facility owner, the distribution system operator and the closed distribution system operator**

This section of DCC discusses the general requirements on demand facility owners, the distribution system operators and the closed distribution system operators for ensuring compliance with DCC.

Under the legal text, any demand or distribution customer who has a CUSC contract (e.g. A Network Operator or Non-Embedded Customer) will have to satisfy the compliance requirements of the European Compliance Processes (ECPs) and Demand Response Providers who are not necessarily CUSC parties will have to satisfy the compliance requirements in the DRSC. It is possible that a Demand Response Provider could also be a User (as defined in the Grid Code) in which case the requirements of the ECPs and the DRSC will apply.

The compliance requirements for services provided to DNOs are included in DPC9 and evidence is gathered via the proposed proformas.

#### **Article 35 - Tasks of the Relevant System Operator**

Article 35 relates to the tasks of the Relevant System Operator in ensuring that Users and Demand Response Providers comply with the requirements of DCC. As outlined above with regard to Article 34, the compliance obligations on the Relevant System Operator for Users is outlined in the ECPs and the compliance obligations on the Relevant System Operator for Demand Response Providers is outlined in the DRSC.

For demand response services provided to National Grid by distribution connected parties, National Grid will take the lead in the compliance process, with co-

operation as necessary by the relevant DNO. For demand response services provided to DNOs, Demand Response Providers need to provide the information requested in the proformas for the installation document in Annex 3.

### **Articles 36 to 45 - Compliance testing and simulations**

The titles of these Articles are as follows:

- Common provisions for compliance testing (Article 36)
- Compliance testing for disconnection and reconnection of transmission-connected distribution facilities (Article 37)
- Compliance testing for information exchange of transmission-connected distribution facilities (Article 38)
- Compliance testing for disconnection and reconnection of transmission-connected demand facilities (Article 39)
- Compliance testing for information exchange of transmission-connected demand facilities (Article 40)
- Compliance testing for demand units with demand response active power control, reactive power control and transmission constraint management (Article 41)
- Common provisions on compliance simulations (Article 42)
- Compliance simulations for transmission-connected distribution facilities (Article 43)
- Compliance simulations for transmission-connected demand facilities (Article 44)
- Compliance simulations for demand units with demand response very fast active power control (Article 45)

For Articles 36 to 45, the legal text has been drafted using the same principles adopted for Articles 34 and 35 in which the testing and simulation requirements for Users are defined in the ECPs and for Demand Response Providers are defined in the DRSC.

With regards to the Distribution Code, the compliance requirements of article 41 are catered for in the proformas attached as Annex 3.

### **Articles 46 and 47 - Compliance monitoring**

The Article titles are as follows:

- Compliance monitoring for transmission-connected distribution facilities (Article 46)
- Compliance monitoring for transmission-connected demand facilities (Article 47)

These requirements only apply to Users (Network Operators and Non-Embedded Customers) and therefore, only the legal text in the ECPs has been updated to reflect these requirements.

## 7 Impacts and Other Considerations

- i. *The Grid Code and Distribution Code will bear the primary impact of the EU Connection Code mods.*
- ii. *The Transmission/Distributions connections and compliance processes will need to be slightly altered to ensure they accommodate the new EU requirements as set out in the modified Grid Code and Distribution Codes.*
- iii. *No system changes are anticipated as a result of implementing the EU Connection Codes*

### **Does this modification impact a Significant Code Review (SCR) or other significant industry change projects, if so, how?**

The EU Network Code implementation is being undertaken as a significant programme of work within the GB industry. This modification forms part of that programme, but is not part of an on-going SCR.

### **Consumer Impacts**

This modification implements consistent technical standards across the EU for the connection of new transmission-connected Demand facilities, new transmission-connected distribution facilities and new distribution systems, including new closed distribution systems. It also addresses the performance requirements for new demand units used by a demand facility or a closed distribution system to provide Demand Response to relevant system operators and relevant TSOs. This should lead to efficiencies and potential cost savings for stakeholders.

The Demand Side Response provisions should also improve market access for new entrants, leading to greater levels of competition, which should lead to lower costs for end consumers.

The Workgroup, on the 23 January 2018 noted the cross over with GC0106 in Article 53 of SOGL (System Operator Guideline). This interaction was noted and the Workgroup agreed that this would be made clear within the legal text for the two consultations across the two modifications.

## 8 Workgroup Discussions – Initial four Workgroup meetings

The GC0104 Workgroup met on four occasions ahead of issuing this Workgroup Consultation paper to seek wider Industry views on the proposed draft solution from the Proposer. The Workgroup have not yet discussed any potential alternatives to the proposed Original solution but welcome any potential alternatives being raised by Industry for discussion at future Workgroup meetings following the Workgroup Consultation.

Any potential alternative option(s) will be considered by the Workgroup and if the potential alternative(s) is supported by a majority of the Workgroup (or the Workgroup chair) because they believe it better meets the Applicable Grid Code Objectives as compared to the Original then the potential alternative will be taken forward as a formal Alternative to the Original proposal (meaning that they will be

worked up, legal text prepared and, ultimately, they will be available for Ofgem to approve, if appropriate, and implemented).

At the initial Workgroup meeting, held on 6 September 2017 the Proposer talked through the slides that they had produced outlining their view of the defect for new Transmission Connected Demand, new Transmission Connected Distribution Facilities plus new Distribution Systems and the proposed structure for progressing the piece of work. The slides can be found at the following link:

<https://www.nationalgrid.com/uk/electricity/codes/grid-code/modifications/gc0104-eu-connection-codes-gb-implementation-demand>

At the second Workgroup meeting, held on the 6 December 2017 the Proposer talked through DCC Compliance and the slides that can be found at the following link labelled 6 December presentation:

<https://www.nationalgrid.com/uk/electricity/codes/grid-code/modifications/gc0104-eu-connection-codes-gb-implementation-demand>

The Proposer also talked through the two options which can be found in Annex 1 that they believed were available to produce a solution to the defect and sought feedback from the Workgroup on this. A Workgroup member noted that there was another (third) option. These options and table that was circulated for review by the Proposer can be found at Annex 1.

At the third Workgroup meeting, held on the 23 January 2018 the Workgroup discussed the following agenda items:

- Annex 1 options table and the solution adopted by the Proposer as their preferred option based on stakeholder feedback provided
- Interpretation of a new DNO GSP

## **C16 & SCTs vs. Grid Code**

The Proposer outlined the engagement that they had carried out to form their proposed solution to the defect. This included presentation at the Proposer's 'Power Responsive Flexibility Forum'. The presentation that the Proposer gave can be found on the GC0104 area of the National Grid website. In addition the Proposer asked the GC0104 Workgroup and the C16 Workshop for feedback.

The Proposer stated that they would, as a result of the feedback that had been provided by both the GC0104 Workgroup and additional forums be proposing to amend the Grid Code. This proposed solution (the Original) can be located in the Solution Section of this Consultation (Section 6) document.

The Proposer went on to outline that they have sought to address the feedback from the respondents and have proposed a new section of the Grid Code for Demand Response services to prevent those not obligated to review the Grid Code to access their obligations, should they provide the service, quickly and in the most simple and transparent way possible.



The governance arrangements of the C16 documentation was highlighted by a Workgroup member; they stated that the C16 process is not subject to open and transparent governance (unlike the Grid Code and CUSC). The C16 process means that amendments cannot be made by Users, Citizens Advice or other parties (such as trade associations or other groups of interested parties) designated as a 'Materially Affected Party by Ofgem as they can be by the Grid Code and CUSC through their Open Governance Rules.

### **Commercial impacts and discussions**

A Workgroup member raised concerns around a lack of details about the commercial framework for the Demand Connection Code (DCC) as the proposed contractual approach set out by the Proposer was neither harmonised or open and transparent. The Workgroup member noted that without this clarity on the harmonised rules for grid connection of demand facilities and distribution systems (as well as for demand side response provided to relevant network companies) then the implementation of the DCC would not be completed for GB.

The Proposer stated that the GC0104 Workgroup had been formed to address the Defect that the Grid Code was not compliant with DCC requirements and that the commercial arrangements for Demand Side Response services fell outside the scope of this modification, as stated in the original Modification Proposal that was presented to and accepted by the Grid Code Review Panel. It was noted that a separate team within National Grid are responsible for administering the contracts process. The Code Administrator took an action to make the CUSC Panel Secretary aware of this piece of work. The Proposer stated that this modification identified the defect of the technical aspects of the Demand Connection Code. The Code Administrator has completed the action above following meeting.

A Workgroup member noted the wording outlined in Article 58 (1) and (2):

#### Amendment of contracts and general terms and conditions

1. Regulatory authorities shall ensure that all relevant clauses in contracts and general terms and conditions relating to the grid connection of new transmission-connected demand facilities, new transmission-connected distribution facilities, new distribution systems and new demand units are brought into compliance with the requirements of this Regulation.
2. All relevant clauses in contracts and relevant clauses of general terms and conditions relating to the grid connection of existing transmission-connected demand facilities, existing transmission-connected distribution facilities, existing distribution systems and existing demand units subject to all or some of the requirements of this Regulation in accordance with paragraph 1 of Article 4 shall be amended in order to comply with the requirements of this Regulation. The relevant clauses shall be amended within three years following the decision of the regulatory authority or Member State as referred to in Article 4(1).

The Workgroup member stated that the requirement in the DCC was to have harmonised rules for connection. This meant that the contractual arrangements

needed to be identical in the cases of (i) new Transmission Connected Demand, (ii) new Transmission Connected Distribution Facilities plus (iii) new Distribution Systems. If local circumstances warranted a change then the prescribed DCC derogation procedure would need to be followed.

The Workgroup went onto discuss what amendments could possibly be required in respect of the Distribution System. In terms of Demand response, the Distribution Code representative noted that they did not have the equivalent to the C16.

It was noted that where Demand Response was being provided to a relevant system operator who was not a TSO (which was expected to be new demand unit used by a demand facility to provide Demand Response to a distribution system operator) then a new template could be added to the DCUSA. A Workgroup member noted that the Rules and Regulations need to be the same.

Another Workgroup member stated that the solution to the defect identified needs to ensure it does not cause any barriers to entry. The Proposer stated that they were attempting to, within their solution, ensure the process proposed is as simple as possible for Industry to understand and follow.

Additionally a Workgroup member noted that when drafting the Demand response requirements across the Grid and Distribution Codes that consistency would be required between the DSO and TSO.

### **Interpretation of a new DNO GSP**

The Proposer for GC0104 asked the following question of the Workgroup and requested a discussion on this element of the modification:

- If a DNO upgrades it's Grid Supply Point to the point that the connection agreement needs to be significantly revised, our understanding is that the DCC extends only to that GSP not the DNO as a whole?
- Is this interpretation correct?
- Is there anything else we need to consider?

A Workgroup member stated that EONs and IONs would apply and that compliance comes from the combination of GSP and distribution system, not necessarily one or the other.

Another Workgroup member talked through an example of the equivalent situation at either a power station or existing demand facility and referred to Article 4 (1) (a) and (b) of the DCC :

*"1. Existing transmission-connected demand facilities, existing transmission-connected distribution facilities, existing distribution systems and existing demand units that are or can be used by a demand facility or a closed distribution system to provide demand response services to a relevant system operator or relevant TSO, are not subject to the requirements of this Regulation, except where:*

*(a) an existing transmission-connected demand facility, an existing transmission-connected distribution facility, an existing distribution system, or an existing*

*demand unit within a demand facility at a voltage level above 1 000 V or a closed distribution system connected at a voltage level above 1 000 V, has been modified to such an extent that its connection agreement must be substantially revised in accordance with the following procedure:*

*(i) demand facility owners, DSOs, or CDSOs who intend to undertake the modernisation of a plant or replacement of equipment impacting the technical capabilities of the transmission-connected demand facility, the transmission-connected distribution facility, the distribution system, or the demand unit shall notify their plans to the relevant system operator in advance; (ii) if the relevant system operator considers that the extent of the modernisation or replacement of equipment is such that a new connection agreement is required, the system operator shall notify the relevant regulatory authority or, where applicable, the Member State; and*

*(iii) the relevant regulatory authority or, where applicable, the Member State shall decide if the existing connection agreement needs to be revised or a new connection agreement is required and which requirements of this Regulation shall apply; or*

*(b) a regulatory authority or, where applicable, a Member State decides to make an existing transmission-connected demand facility, an existing transmission-connected distribution facility, an existing distribution system, or an existing demand unit subject to all or some of the requirements of this Regulation, following a proposal from the relevant TSO in accordance with paragraphs 3, 4 and 5.”*

A workgroup member stated that the application of the wording across the EU Connection Code Modifications (GC0100, 101, 102 and 104) should be consistent as the wording is identical between the DCC (extract above) and the equivalent Article 4 (1) (a) and (b) in the RfG. They also noted that the wording in DCC Article 4 (1) (a) and (b) indicated that there should be a process where the Regulator is informed. It was additionally noted that there could be an implication for Ofgem that they needed to be made aware of. NGET took an action to speak to Ofgem around this and report back to the Workgroup so that stakeholders were fully aware of the outcome of those discussions.

The Proposer of GC0104 took an action to review the GC102 legal text and propose GC0104 legal text to ensure the application is consistent ahead of the Workgroup meeting ahead of the issuing of the Workgroup Consultation.

Please note that all presentations provided and discussed at the Workgroup meetings can be found at the following link:

<https://www.nationalgrid.com/uk/electricity/codes/grid-code/modifications/gc0104-eu-connection-codes-gb-implementation-demand>

Following the issue being raised with the Authority they provided the following clarity for the GC0104 Workgroup:

*In terms of Article 4(1), the working group discussed the issues (eg time delays, resource requirements) associated with Ofgem reviewing and determining whether*

*parties should be treated as “new” or “existing” in all these cases . This was considered unnecessary where the generator and system operator agreed about its status. We considered that a practical interpretation of Article 4(1) was that we reviewed and decided whether parties should be treated “new” or “existing” where there was a dispute about whether the generator should be treated as “new” or “existing”. This approach was not considered inconsistent with the wording of the RfG.*

*The Authority understands that there are concerns about the term “substantial modification”. They believe that this term has been derived from the Article 4 (1)*

*“Existing power-generating modules are not subject to the requirements of this Regulation, except where:*

- (a) a type C or type D power-generating module has been modified to such an extent that its connection agreement must be substantially revised in accordance with the following procedure”.*

*There were discussions during the working group about the production of an additional document to provide more information to stakeholders about the assessment process under Article 4 (1), so that parties had a better understanding of the type of change that would lead to their generator being treated as “new”. It sounds like this document might be useful.*

*The Authority would reiterate the message that if there is any concern or dispute about the assessment undertaken by the system operator, then it can be forwarded to us for decision.*

## **Low Voltage Demand Disconnection (LVDD) Article 19 (2)**

The Workgroup discussed the proposed solution with respect to LVDD. It was noted that the DCC specifies the requirements necessary for LVDD should it be introduced for GB. That decision will be made by the relevant TSO which, in this case, is NGET. NGET informed the Workgroup that it has no intention of taking up this right at this time.

Therefore, during the workgroup discussions it was noted that should low voltage demand disconnection be introduced into GB in the future, it would need to be introduced via the GB Grid Code Governance process and would need to be consistent with the requirements of DCC in respect of new sites only.

Low voltage demand disconnection at new sites only is likely to be of limited benefit for the System. To be effective, LVDD needs to be consistently applied across the whole system and therefore would need to be addressed as a separate GB work group. That said, if LVDD was introduced in GB in the future, then the fundamental principles of the DCC would need to be reflected in any future GB legal drafting.

## **Demand Response Services**

During the Workgroup meetings there were discussions around the correct vehicle to facilitate these new requirements as they do not currently exist in the GB frameworks. For example, a party who offers to provide a Demand Response Service need not necessarily be a CUSC party and obliged to meet the requirements of the Grid Code. After the Proposer discussed this issue with the Workgroup and presenting it at both the Power Responsive Flexibility Forum in January 2018 and the 2018 C16 workshop, feedback was requested by the Proposer from stakeholders and customers. The advantages and disadvantages of each option, according to the Proposer, were presented and circulated to the Workgroup for their comment and feedback. The decision presented by the Proposer was between putting the requirements in Standard Contract Terms (and the categories stated in C16) or putting the requirements in the Grid Code. The table circulated by the Proposer to the Workgroup is shown in Appendix 1 and summarises the advantages and disadvantages of both options.

A Workgroup member noted that there was a third option which was to put the technical details in the Grid Code and the contractual arrangements in the CUSC. This would allow more stakeholders, as well as groups representing non CUSC parties (such as end consumers) to raise modification proposals to change the contractual terms – this was not possible with the C16 documentation as open governance and the CACoP principles were not applicable (to C16 matters).

Following these presentations and discussions, the majority of industry parties favoured the requirements to go into the Grid Code, however, those in favour of standard contract terms stated they were concerned that the requirements would not be easily found and so the Proposer set out that the solution is to create a separate and standalone section in the Grid Code for these requirements (and the corresponding compliance) which customers will be directed to via their contract. The Grid Code will therefore be updated in line with this view and a new section of the Grid Code will be introduced entitled Demand Response Services Code. A Workgroup member believed that placing the contractual arrangements in the CUSC (rather than the C16 approach) would be better for stakeholders and customers.

The Proposer noted that whilst these commercial arrangements were worth considering, the GC0104 Workgroup had been formed to address the Defect that the Grid Code was not compliant with DCC requirements and that the commercial arrangements for Demand Side Response services fell outside the scope of this modification, as stated in the original Modification Proposal that was presented to and accepted by the Grid Code Review Panel.

The GC0104 Workgroup met on the 22 February to discuss issuing the Workgroup Consultation.

Some Workgroup members expressed that, in their view, some further clarity and work was required ahead of issuing the Consultation to Industry. They stated that this was required as this is the only Consultation within the modification process where Industry can provide their input and potentially influence amendments and raise potential alternatives to the proposed solution.

The following information below has been added to the Consultation following the last Workgroup meeting, following the issues raised:

Workgroup members stated that the Standard Contract Terms needed to be available as part of this Consultation, please find the links to these below:

**Firm Frequency Response:**

[https://www.nationalgrid.com/sites/default/files/documents/FFR%20SCTs%20-%20Issue%208%20Feb%201st%202017\\_0.pdf](https://www.nationalgrid.com/sites/default/files/documents/FFR%20SCTs%20-%20Issue%208%20Feb%201st%202017_0.pdf)

**Short Term Operating Reserve:**

[https://www.nationalgrid.com/sites/default/files/documents/STOR%20Standard%20Contract%20Terms%20Issue%2010%20-%28Effective%20from%201%20April%202017%29%20-%281%29\\_0.pdf](https://www.nationalgrid.com/sites/default/files/documents/STOR%20Standard%20Contract%20Terms%20Issue%2010%20-%28Effective%20from%201%20April%202017%29%20-%281%29_0.pdf)

**Fast Reserve:**

<https://www.nationalgrid.com/sites/default/files/documents/Fast%20Reserve%20Tender%20Rules%20and%20Standard%20Contract%20Terms%20-%20Effective%201%20April%202015.pdf>

**DRSC**

Workgroup members raised some concerns that it wouldn't be clear for demand providers to follow the requirements as the DRSC was referring to other documents within it so the Proposer has amended the legal text following the meeting so it slots into the SCTs and where it does make reference (as sometimes it has to in order to avoid adding extra requirements into it) the requirements are clearer (in the Proposers view) and now easier to find/follow.

Following the discussions at the last GC0104 meeting the Proposer did the following:

**GSP**

Some Workgroup members were concerned around the definitions of EU Code User and EU Grid Supply Point in that if they modified their GSP (Grid Supply Point) and what would this mean for them.

The Proposer went away and considered the possibilities further and it was clarified by the Proposer that if an existing DNO were to upgrade a GSP (to the extent it became an EU GSP) it would be treated as a Distribution Facility (DCC definition) and that only the GSP would be treated as an EU GSP and the rest of the distribution system would not be treated as a (EU) distribution system as defined in DCC. The Proposer clarified that only the Articles in DCC that applied to Distribution Facilities would be applicable to the EU GSP.

**TSO Consultation – Article 9 DCC**

A Workgroup member raised concerns around Article 29(d) and whether the Proposer, as TSO has carried out a Consultation. The Proposer felt that the public

consultation included the TSOs and therefore a separate consultation was not necessary.

## 9 Relevant Objectives - initial assessment by Proposer

Impact of the modification on the Grid Code Relevant Objectives:	
Relevant Objective	Identified impact
To permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity	Positive
To facilitate competition in the generation and supply of electricity (and without limiting the foregoing, to facilitate the national electricity transmission system being made available to persons authorised to supply or generate electricity on terms which neither prevent nor restrict competition in the supply or generation of electricity)	Positive
Subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution systems in the national electricity transmission system operator area taken as a whole	Positive
To efficiently discharge the obligations imposed upon the licensee by this license and to comply with the Electricity Regulation and any relevant legally binding decisions of the European Commission and/or the Agency; and	Positive
To promote efficiency in the implementation and administration of the Grid Code arrangements	Neutral

DCC is one of the eight EU Connection Codes which derive from the Third Energy Package legislation; focused on delivering security of supply; supporting the connection of new renewable plant; and increasing competition to lower end consumer costs. It therefore directly supports the first three Grid Code objectives.

Furthermore, this modification is to ensure GB compliance of EU legislation in a timely manner, which positively supports the fourth Grid Code applicable objective.

Impact of the modification on the Distribution Code Relevant Objectives:	
Relevant Objective	Identified impact
Permit the development, maintenance, and operation of an efficient, coordinated and economical System for the distribution of electricity.	Neutral



Facilitate competition in the generation and supply of electricity.	<b>Neutral</b>
Efficiently discharge the obligations imposed upon DNOs by the Distribution Licence and comply with the Regulation (where Regulation has the meaning defined in the Distribution Licence) and any relevant legally binding decision of the European Commission and/or Agency for the Co-operation of Energy Regulators.	<b>Positive</b>
Promote efficiency in the implementation and administration of the Distribution Code.	<b>Neutral</b>
	<b>Neutral</b>

This modification is necessary to ensure GB compliance of EU legislation in a timely manner, which positively supports the third Distribution Code applicable objective.

## 10 Implementation

This modification must be in place to ensure the requirements of DCC are set out in the GB Grid and Distribution codes *by* two years from Entry Into Force - 7 September 2016 – which means it will need to be in place by 7<sup>th</sup> September 2018.

It is therefore crucial that this work is concluded swiftly to allow the industry the maximum amount of time to consider what they need to do to arrange compliance.

## 11 Workgroup Consultation questions

The GC0104 Workgroup is seeking the views of Grid Code Users and other interested parties in relation to the issues noted in this document and specifically in response to the questions highlighted in the report and summarised below:

### Standard Workgroup Consultation questions:

1. Do you believe that GC0104 original proposal better facilitate the Applicable Grid Code Objectives?
2. Do you support the proposed implementation approach?
3. Do you have any other comments?
4. Do you wish to raise a Workgroup Consultation Alternative request for the Workgroup to consider? The form to complete can be found here:

<https://www.nationalgrid.com/uk/electricity/codes/grid-code>

### Specific GC0104 Workgroup Consultations:

5. Do you agree that DNOs should only implement the Demand Response requirements relating to Demand Response Active Power Control and Demand Response Reactive Power Control, recognizing that the other DSR services in Article 27 are services for the Transmission System Operator?
6. Are the rights and obligations of aggregators appropriately allowed for in the drafting of ECC and DPC9? If not, what additional provisions would you suggest?
7. Do you have any comments on the approach taken with the Installation Document pro-forma proposed for Demand Response services contracted to DNOs? Do you agree that there is no distinction necessary here for HV or LV customers?
8. Do you have any views on how to tailor the compliance process, and documentation, to accommodate both individual Demand Response Service Providers and those Demand Response Service Providers who are aggregators?
9. Can you see any issues with treating GSPs and EU GSP's in the way set out in the Glossary and Definitions and European Connection Conditions of the solution?
10. Do you agree that the DRSC reflects the requirements of DCC and provides sufficient information for Demand Response Providers. If not, please state why do not believe this to be the case and what you believe would provide a better alternative.
11. If you do not believe the proposal sufficiently discharges DCC obligations, can you please provide examples where this is the case?

## **12. Consultation question specifically for Transmission Licensees**

As a Transmission Licensee, are there any aspects of this consultation you do not agree with from a Transmission Licensees perspective? In particular do you have any comments with regard to DCC Articles 28 and 29 in particular Article 29(2)(d) where there is a requirement for the relevant TSO to consult with TSO's in the Synchronous Area.

***If you believe there are issues in the legal text, can you please bring these to our attention by using the space provided on the response proforma. These will then be discussed at the GC0104 legal text session planned following the closure of this Consultation.***

Please send your response using the Response Proforma which can be found on the National Grid website via the following link:

<https://www.nationalgrid.com/uk/electricity/codes/grid-code/modifications/gc0104-eu-connection-codes-gb-implementation-demand>

In accordance with Governance Rules of the Grid Code, Any Authorised Electricity Operator; the Citizens Advice or the Citizens Advice Scotland, NGET or a Materially Affected Party may (subject to GR.20.17) raise a Workgroup

Consultation Alternative Request. If you wish to raise such a request, please use the relevant form available at the weblink below:

<https://www.nationalgrid.com/uk/electricity/codes/grid-code>

Views are invited upon the proposals outlined in this report, which should be received by **5pm** on **29 March 2018**. Your formal responses may be emailed to: [grid.code@nationalgrid.com](mailto:grid.code@nationalgrid.com)

If you wish to submit a confidential response, please note that information provided in response to this consultation will be published on National Grid's website unless the response is clearly marked "Private & Confidential", we will contact you to establish the extent of the confidentiality. A response marked "Private & Confidential" will be disclosed to the Authority in full but, unless agreed otherwise, will not be shared with the Grid Code Review Panel or the industry and may therefore not influence the debate to the same extent as a non-confidential response.

Please note an automatic confidentiality disclaimer generated by your IT System will not in itself, mean that your response is treated as if it had been marked "Private and Confidential".

Please note that you can also send responses directly to the Authority.

## Annex 1 Demand Response table

This table was circulated as produced below, by the Proposer (unchanged), to the GC0104 Workgroup for their views. A further option (3) was suggested by a Workgroup member and is included below:

Option	Advantages	Disadvantages	Timescales	How commerciality and compliance would fit
Technical requirements in Grid Code, commercial facilitation in contracts/C16	Fully transparent with a number of public consultations to develop	Not efficient to implement; still requires changes to contracts as well as Grid Code	Open Governance – would follow Grid Code process timescales (approximately 6 months). Other Grid code changes will be progressing at the same time though.	<p>Commerciality – would go in contracts and refer parties to the Grid Code for technical requirements including compliance. It is envisaged that reciprocal arrangements would be required in the D Code.</p> <p>Putting it another way the commercial contract would set out the services required, a condition of the contract would then specify the technical and compliance requirements required of the Grid Code with similar arrangements in for the D Code.</p>
		Not all demand users currently need to abide by Grid Code and are not CUSC parties– not user friendly		
Technical requirements and commercial facilitation in standard contract terms/C16	Simplifies arrangements; only requires changes to contracts	Not codified	Consultation process as set out in Licence, requires two 4 week periods of consultation followed by Ofgem approval.	Commerciality – commercial and technical requirements would all be in one contract.
	Requirements can't be changed by parties not affected by DCC			
	Demand Users only need to refer to their contract – easy to use.			

	Demand Users not made to comply with the Grid code where they didn't previously.			
<b>Following circulation of the above from the Proposer the option below was suggested as an option by a Workgroup member</b>				
Technical requirements in Grid Code, commercial facilitation in CUSC	Fully transparent with a number of public consultations for both the Grid Code and CUSC changes; which can be proposed (and owned) by Users, Citizen's Advice, any Materially Affected Party (plus groups representing consumers, trade associations etc., can be designated a Materially Affected Party). Parties do not need to comply with all the Grid Code or CUSC obligations, just those relevant to connection and Demand Response (which means a level playing field for all parties).	[XYZ]	Open Governance / CACoP principles – would follow Grid Code and CUSC process timescales (approximately 6 months, although it can be much quicker, if needed). Other changes will be progressing at the same time though. Ofgem approval of all material changes to the technical or commercial arrangements.	<p>Commerciality – would go in contract (as an Exhibit to the CUSC) be applicable to parties and refer parties to the Grid Code for technical requirements including compliance. This has been done for over 15 years in GB for similar matters and is a proven and robust approach.</p> <p>It is envisaged that reciprocal arrangements would be required in the D Code.</p> <p>Putting it another way the commercial contract (in the CUSC) would set out the services required, a condition of the contract would then specify the technical and compliance requirements required of the Grid Code with similar arrangements in for the D Code.</p>

## Annex 2 Grid Code Legal Text

This can be found separately uploaded to our website under Annex 2. Please note that the legal text will be thoroughly reviewed with the Workgroup following the Consultation so please send in any comments for review.

***Please note that the draft legal text has been drafted on top of modifications GC0100-102 but that these modifications are yet to be approved by the Authority.***

## Annex 3 Distribution Code Legal Text

This can be found separately uploaded to our website under Annex 3. Please note that the legal text will be thoroughly reviewed with the Workgroup following the Consultation so please send in any comments for review.

## Annex 4 Terms of Reference

## Annex 5 DCC Code Mapping