

## Stage 03: Report to the Authority

Grid Code

# GC0050 Demand Control And OC6

What stage is this document at?

01 Workgroup Report

02 Industry Consultation

03 Report to the Authority

This proposal seeks to modify the Grid Code to meet the existing capabilities and requirements of the Distribution Network Operators to implement Demand Control Instructions

The purpose of this document is to assist the Authority in its decision of whether to implement the proposed Grid Code Modification.

**Published on:** 07 March 2014



***National Grid recommends:***

National Grid supports the implementation of GC0050 as it better facilitates the Applicable Grid Code Objectives (i) and (iii)



***High Impact:***

Network Operators.



***Medium Impact:***

None identified



***Low Impact:***

None identified

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### Any Questions?

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## About this document

This document is the Report to the Authority for GC0050 which contains the responses to the Industry Consultation and the National Grid recommendation. The purpose of this document is to assist the Authority in their decision whether to implement the GC0050 proposed changes.

The revisions to the Grid Code proposed by National Grid and sent to the Authority require approval by that body and will, if approved, come into force on such date (or dates) of which Authorised Electricity Operators will be notified by National Grid, in accordance with the Authority's approval.

## Document Control

Version	Date	Author	Change Reference
1.0	07 March 2014	National Grid	Final Report to the Authority

## 1 Executive Summary

- 1.1 GC0050 was proposed by National Grid and submitted to the Grid Code Review Panel for their consideration on 19 September 2012. The proposal was raised following the submission of the Grid Code paper on “Demand Control and OC6”. This paper described the existing Distribution Network Operators (DNOs) capability, and put forward the benefits for customers of using Voltage Reduction as a means of reducing the demand on the transmission system. The paper also proposed a revision of the Grid Code obligations relating to Demand Control OC6.
- 1.2 The Panel determined that the proposal should progress to a Workgroup to examine implementation timescales for Demand Control instructions. The Workgroup was established on 05 Dec 2012 and concluded on 21 Nov 2013 following 5 meetings.
- 1.3 The workgroup recommended amendments to the Grid Code obligations relating to Demand Control OC6. The objective of the changes is to explicitly distinguishing between Voltage Reduction and Demand Disconnection services and to improve clarity to the implementation timescales.
- 1.4 An Industry Consultation was published on 30 Jan 2014 for 20 business days. The consultation completed on 28<sup>th</sup> February 2014 in which a total of four responses were received, all of which were supportive of the proposed changes, although it was noted that these changes should not increase the frequency in which voltage control is utilised and any change in the frequency of usage should result in further consultation.

### National Grid Recommendation

- 1.5 National Grid supports the implementation of GC0050 as it better facilitates the Applicable Grid Code Objectives (i) and (iii). This is achieved by:
  - Providing accurate information required to enable National Grid to better manage the transmission system in an emergency situation.
  - Facilitates information exchange between DNOs and National Grid such that accurate knowledge of available Demand Control tools is received in a timely manner.

## 2 Why Change?

- 2.1 The GCRP paper (pp11/02)<sup>1</sup> summarised DNOs positions around Demand Control being implemented within five minutes and investigated the timing of each of the steps that need to be taken to implement Voltage Reduction.
- 2.2 The historic expectation has been that a 3% Voltage Reduction would deliver a demand reduction of 5%; however studies have since indicated that the demand reduction arising from a 3% Voltage Reduction was variable, and more likely to be in the region of 3%. The current drafting of the Grid Code requires a 5% reduction in demand at the time of the instruction be delivered. DNO's have suggested that they are unlikely to actually deliver a 3% Voltage Reduction within a five minute period, and all DNOs agreed that Demand Control via Voltage Reduction is more likely to be delivered in a period between 5 and 13 minutes.

### Background

- 2.3 The Grid Code obligations relating to Demand Control are documented in OC6.5. OC6.5.3 specifies the functional requirements of the scheme;
- 2.4 OC6.5.3
  - (a) Whether a National Electricity Transmission System Warning – High **Risk of Demand Reduction** or **National Electricity Transmission System Warning - Demand Control Imminent** has been issued or not:-
    - (i) provided the instruction relates to not more than 20 per cent of its total **Demand** (measured at the time the **Demand** reduction is required); and
    - (ii) if less than that, is in four integral multiples of between four and six per cent, each **Network Operator** will abide by the instructions of **NGET** with regard to **Demand** reduction under OC6.5 without delay.
  - (b) The **Demand** reduction must be achieved within the **Network Operator's System** as far as possible uniformly across all **Grid Supply Points** (unless otherwise specified in the **National Electricity Transmission System Warning - High Risk of Demand Reduction**) either by **Customer** voltage reduction or by **Demand Disconnection**, as soon as possible but in any event no longer than five minutes from the instruction being given by **NGET**.
- 2.5 The GCRP paper pp11/02 highlighted that most DNOs plan to achieve the Grid Code requirements by a combination of Voltage Reduction and Demand Disconnection. In relation to Voltage Reduction, there are two factors associated with the requirement i.e. demand reduction achieved (which in practice is likely to be less than previously expected) and the implementation time (which in practice is likely to be longer than as currently defined in the Grid Code).

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<sup>1</sup> <http://www2.nationalgrid.com/WorkArea/DownloadAsset.aspx?id=28451>

### 3 Solution

- 3.1 The proposed solution is to amend OC6.5 and OC6.7 to improve clarity with regard to explicitly distinguishing between Voltage Reduction and Demand Disconnection services, and the implementation timescales.
- 3.2 The text required to give effect to the proposal is contained in Annex 1 of this document.
- 3.3 Regular assessment of Demand Control available via Voltage Reduction should be carried out through annual tests coordinated by National Grid with the DNOs.

## 4 Summary of Workgroup Discussions

### Purpose & Scope of Workgroup

- 4.1 At the September 2011 GCRP, Alan Creighton presented pp11/02 which provided additional clarity on the effectiveness of the Voltage Reduction schemes deployed by most DNOs, identified the customer benefits of using Voltage Reduction as a means of delivering Demand Disconnection and suggested a possible change to the drafting of OC6.5. The GCRP agreed that a Workgroup should be established to examine implementation timescales for Demand Control instructions.
- 4.2 The GCRP agreed that this issue required further investigation and approved the Terms of Reference.
- 4.3 The Workgroup met five times over the period between 05 December 2012 and 21 November 2013 where the following topics were discussed

### Grid Code Requirements in relation to OC6 and Demand Control

- 4.4 The Workgroup focused on Section OC6.5 of the Grid Code that allows National Grid to instruct DNOs to reduce demand by up to 20% in four stages, or under certain circumstances up to 40% in 8 stages. Each stage is nominally 5% to be delivered within 5 minutes of instruction. This facility is only used under extreme conditions when all available sources of generation have been exhausted and the only option available to balance the system is to reduce demand.
- 4.5 Discussions commenced around Demand Control and whether this can be achieved either through Voltage Reduction or the disconnection of customer demand. It has historically been assumed that the first two stages can be achieved through Voltage Reductions with a 3% Voltage Reduction providing a 5% demand reduction, and a 6% Voltage Reduction providing a 10% demand reduction. Further demand reductions would require direct disconnection of customer demand.
- 4.6 Further discussions focused on the requirements within Grid Code OC6.5.3 which states that Demand Control should be implemented as soon as possible but in the event no longer than five minutes from the instruction being given by National Grid. The five minute requirement was based on being able to stabilise and secure the National Electricity Transmission System in emergency situations.
- 4.7 Uncertainty was expressed over where the timescale originated, and it was assumed that this timescale was originally worded as 'promptly', meaning the time taken to take the call and respond. It is suspected that five minutes comes from the same root as five minute reserve, in that it's the point where National Grid can reasonably expect to implement manual action following on from primary response (10 seconds) and secondary response (30 seconds to 30 minutes) to ensure that the system frequency is restored back within operational limits (in this case when there is no further reserve that can be called upon).
- 4.8 The Workgroup reached a view that currently not enough was known about the effectiveness of Voltage Reduction to provide certainty over what it can deliver.

## Voltage Reduction

- 4.9 The Workgroup discussed that Voltage Reduction is implemented at DNO primary substations and that the implementation time with modern SCADA systems is probably faster than in the past.
- 4.10 Alan Creighton summarised the paper that had been presented to the GCRP (pp11/02) to the Workgroup explaining DNOs positions around Demand Control being implemented with five minutes, and investigations on the timing of each of the steps that need to be taken to implement Voltage Reduction. The following points were discussed:
- The historic expectation was that a 3% Voltage Reduction would deliver a demand reduction of 5%; however studies had indicated that the demand reduction for a 3% Voltage Reduction was variable, and more likely to be in the region of 3%.
  - The Grid Code is drafted to require 5% reduction in the demand on the system at the time at which the instruction is given and this also introduced a degree of uncertainty around what would actually be delivered.
  - The information collated by the DNO's suggested that one DNO might be able to deliver a 3% Voltage Reduction within five minutes, however it was agreed that in general demand reduction is more likely to be delivered in a period between 5 and 15 minutes. The paper illustrated that all DNOs cannot achieve this 5 minute timescale and it was suggested by the DNOs that implementation of a Voltage Reduction instruction within five minutes has never actually been achievable. This piece of work carried out by DNOs provided a view on what can actually be delivered.
- 4.11 Workgroup debated that the key advantage of Voltage Reduction as a means of Demand Control was that it generally has no observable impact on domestic, industrial or commercial customers and in particular does not result in disconnection of customer supplies. It was generally accepted that because of this Demand Control via Voltage Reduction, is a valuable tool that can be used in a system event to reduce the prospects of implementing Demand Control via Demand Disconnection. The key to its value is to understand the demand reduction that it is likely to deliver, the timescales in which that reduction can be delivered and how it should be used in conjunction with other demand management tools available to National Grid.
- 4.12 Workgroup also debated feedback following internal discussions within National Grid concerning Voltage Reduction / Demand Disconnection requirements. The Electricity National Control Centre (ENCC) at National Grid view remains that the 5 minute timescale from instruction by National Grid is still a requirement based on being able to stabilise and secure the National Electricity Transmission System in emergency situations. This is due to the initial time required to analyse incidents and instigate manual actions which would take 5 minutes, leading to a total time of 10 minutes. Timescales greater than 10 minutes from an initial incident were considered to place the system at increased risk.
- 4.13 Much of the discussion and suggestions at this point had been based on assumptions, as little or no testing has taken place in this area. The Demand Control response has never been formally tested (as black start is) it has only been used when required, which is on relatively rare occasions. It was highlighted that a benchmarking exercise with all DNOs could be beneficial.

## Emergency STOR

- 4.14 In light of the above debate, emergency STOR was discussed. National Grid's current tender volumes equate to around 6GW of which 2.8GW is presently contracted. Within the implementation timescale suggested current availability in the market totals less than 50MW/hr far below the emergency requirement. Worst case scenario to be comparable with OC6 this only equates to 20% of overall demand needed to cover all demand in an emergency situation.
- 4.15 It was agreed by the Workgroup that STOR has potential to be part of the solution and the idea of emergency STOR is worth pursuing within other generation forums where National Grid participate, but not the whole answer for the demand control requirements of the Workgroup.

## Review of Current Processes

- 4.16 The Workgroup discussed an option of explicitly separating the Voltage Reduction and Demand Disconnection elements of the present OC6 obligation such that these services could be called upon separately by National Grid depending on the rate at which a system incident develops; Voltage Reduction could be used in a slower developing incident (as this would take longer to implement and deliver a less certain demand reduction). Demand Disconnection however, could be used in a rapidly developing incident (as it would be implemented quicker and deliver a more certain demand reduction – although customer supplies would be interrupted). On the basis that the two Voltage Reduction stages were (at the time of the discussion) thought likely to deliver say 3% Demand Reduction each, to maintain the existing OC6 functionality of 20% Demand Reduction, this would require three 5% Demand Disconnection stages. In summary:
- VR Stage 1 - 3% Voltage Reduction<sup>2</sup>
  - VR Stage 2 - 3% Voltage Reduction
  - DD Stage 1 – 4-6% demand reduction via Demand Disconnection
  - DD Stage 2 – 4-6% demand reduction via Demand Disconnection
  - DD Stage 3 – 4-6% demand reduction via Demand Disconnection
- 4.17 Following discussion, it was agreed that Voltage Reduction stages should be substantially implemented within ten minutes of instruction from National Grid. Demand Disconnection stages should be completed within five minutes of instruction from National Grid.

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<sup>2</sup> As a result of the voltage reduction tests, 3% is more likely to be 1.5%

## Training Procedures

- 4.18 The Workgroup discussed the merits of an educational process with a familiarisation of Demand Control implementation procedures to identify where any improvements could be made prior to any national testing. DNOs and National Grid reviewed the existing processes and made some minor procedural updates before the formal exercise took place.
- 4.19 DNOs and National Grid reviewed current procedures for managing a system event (rather than specifically implementing a demand reduction instruction which is discussed earlier), and the existing information that might be available such that DNOs could be made more aware of an unfolding incident so that they were better prepared to respond to a Demand Control instruction if it was issued. DNOs asked whether National Grid could share the document that is used to DNOs which is used in this situation, suggesting that this document should be very high-level and include process diagrams to clearly define procedures and management approvals. National Grids internal process was presented at the Working Group meeting 2

## European Codes

- 4.20 The Workgroup discussed potential changes required to comply with European Code changes. Currently there are no code requirements covering Demand Reduction criteria with reference in Article 7 Frequency Control Management of the Network Code for Operational Security that “Each TSO shall implement the necessary Remedial Actions, including Demand Side Management or Load Shedding in order to maintain the frequency quality within Operational Security Limits in its Responsibility Area.”

## Voltage Reduction Testing

- 4.21 The Workgroup discussed that a trial would enable the actual demand reduction delivered by a 3% Voltage Reduction to be established. The tests were carried out during different load windows, morning (10:00am-12:00pm) and afternoon (14:00pm-16:00pm) during periods of relative flat demand. Results from these tests can be found in Annex 4.
- 4.22 A copy of the full Workgroup Report can be found on the National Grid website at:

<http://www.nationalgrid.com/uk/Electricity/Codes/gridcode/consultationpapers>

## Workgroup Recommendations

- 4.23 The Workgroup recommend that the changes to the Grid Code identified in Annex 1 should be progressed to Industry Consultation. The objective of these changes is to improve clarity with regard to explicitly distinguishing between Voltage Reduction and Demand Disconnection services, and the implementation timescales.
- 4.24 The Workgroup recommend that annual Voltage Reduction tests should be carried out with each DNO to confirm the demand reduction achievable via Voltage Reduction. These will be coordinated by National Grid.
- 4.25 The Workgroup recommend that DNO and ENCC procedures and documentation are reviewed, and required changes implemented, to clarify

that where a DNO makes Voltage Reduction services available to National Grid, the Demand Control instruction clearly states whether it requires a DNO to implement Voltage Reduction of Demand Disconnection.

- 4.26 The Workgroup recommend that the Week 24 Guidance Document published by National Grid to provide guidance to DNOs is updated to reflect the changes in 6.1. In particular this will require a minor revision to section 4.2 and the proforma Table 12B provided by National Grid.

## 5 Impact & Assessment

### Impact on the Grid Code

- 5.1 GC0050 requires amendments to the following parts of the Grid Code:
- OC 6.5
  - OC 6.7
- 5.2 The text required to give effect to the proposal is contained in Annex 1 of this document.

### Impact on National Electricity Transmission System (NETS)

- 5.3 The proposed changes will enhance the economic and efficient operation of the National Electricity Transmission System. The changes will clarify achievable timescales and levels of demand reduction enabling the ENCC to better manage demand control procedures.

### Impact on Grid Code Users

- 5.4 The proposed modification will not change the DNOs current operational practices hence the impact is negligible on Grid Code Users.

### Impact on Greenhouse Gas emissions

- 5.5 The proposed modification will not have any impact on Greenhouse Gas emissions.

### Assessment against Grid Code Objectives

- 5.6 National Grid considers that GC0050 would better facilitate the Grid Code objective:

- (i) to permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity;

*This proposal better facilitates this objective by providing the information required to better manage the transmission system for the purposes of operating the transmission system in an emergency situation.*

- (ii) 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);

*The proposal has a neutral impact on this objective*

- (iii) 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; and

*The proposal better facilitates this objective by providing the information required to manage the transmission system.*

- (iv) 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.

*The proposal has a neutral impact on this objective*

### **Impact on core industry documents**

5.7 The proposed modification does not impact on any core industry documents

### **Impact on other industry documents**

5.8 The proposed modification does not impact on any other industry documents

### **Implementation**

5.9 National Grid proposes GC0050 should be implemented by Week 17 2014 or 10 business days after an Authority decision.

5.10 This will allow time for the DNO to establish and implement additional Demand Disconnection stage if required and include the revised information in the 2014 Week 24 submission.

## 6 Consultation Responses

- 6.1 National Grid has consulted Authorised Electricity Operators (AEOs) on this issue. The consultation period opened on 30 Jan 2014 and closed on 28 Feb 2014. 4 responses were received during the consultation period.
- 6.2 The below table provides an overview of the 4 responses received. Copies of the responses are included in Annex 2.

Ref	Company	Supportive	Comments
C/10-CR-01	RWE	Yes	<ul style="list-style-type: none"><li>• Satisfied that proposed change better facilitates the Grid Code objectives.</li><li>• RWE participated in the workgroup and all comments have been made via this process.</li></ul>
C/10-CR-02	EDF Energy	Yes	<ul style="list-style-type: none"><li>• Supportive of changes.</li><li>• Any increase in frequency of usage of voltage reduction should result in future consultation.</li></ul>
C/10-CR-03	Electricity North West	Yes	<ul style="list-style-type: none"><li>• Supportive</li><li>• Proposed Grid Code revisions available to be implemented.</li><li>• Encourages a review on how demand schedules are initiated such as direct control via SCADA link.</li></ul>
C/10-CR-04	Northern Powergrid	Yes	<ul style="list-style-type: none"><li>• Supportive.</li><li>• Participated in workgroup.</li></ul>

### National Grid Comments on Responses

- 6.3 National Grid would like to thank all of the respondents for their comments regarding GC0050. None raised specific comments on the proposed changes.

## Annex 1 - Proposed Legal Text

This section contains the proposed legal text to give effect to the proposals. The proposed new text is in red and is based on Grid Code Issue 5 Revision 1.

OC6.5 PROCEDURE FOR THE IMPLEMENTATION OF DEMAND CONTROL ON THE INSTRUCTIONS OF NGET

OC6.5.1 A **National Electricity Transmission System Warning - High Risk of Demand Reduction** will, where possible, be issued by **NGET**, as more particularly set out in OC6.5.4, OC7.4.8 and BC1.5.4 when **NGET** anticipates that it will or may instruct a **Network Operator** to implement **Demand** reduction. It will, as provided in OC6.5.10 and OC7.4.8.2, also be issued to **Non-Embedded Customers**.

OC6.5.2 Where **NGET** expects to instruct **Demand** reduction within the following 30 minutes, **NGET** will where possible, issue a **National Electricity Transmission System Warning – Demand Control Imminent** in accordance with OC7.4.8.2(c) and OC7.4.8.6.

OC6.5.3 (a) Whether a **National Electricity Transmission System Warning - High Risk of Demand Reduction** or **National Electricity Transmission System Warning - Demand Control Imminent** has been issued or not:

(i) provided the instruction relates to not more than 20 per cent of its total **Demand** (measured at the time the **Demand** reduction is required); and

(ii) if less than that, is in

- two voltage reduction stages each of between two and four percent and
- three **Demand Disconnection** stages each of which can reasonably be expected to deliver between four and six percent **Demand** reduction,

Each **Network Operator** will abide by the instructions of **NGET**, which should specify whether a voltage reduction or **Demand Disconnection** stage is required; OR

(iii) if less than that, is in four ~~integral multiples of~~ **Demand Disconnection** stages each of which can reasonably be expected to deliver between four and six per cent **Demand** reduction,

Each **Network Operator** will abide by the instructions of **NGET** with regard to **Demand** reduction under OC6.5 without delay.

(b) The **Demand** reduction must be achieved within the **Network Operator's System** as far as possible uniformly across all **Grid Supply Points** (unless otherwise specified in the **National Electricity Transmission System Warning - High Risk of Demand Reduction**) either by **Customer** voltage reduction or by **Demand Disconnection**; ~~as soon as possible but in any event no longer than five minutes from the instruction being given by NGET.~~

(c) **Demand Control** initiated by voltage reduction shall be initiated as soon as possible but in any event no longer than two minutes from the instruction being received from **NGET**, and completed within 10 minutes of the instruction being received from **NGET**.

(d) **Demand** control initiated by **Demand Disconnection** shall be initiated as soon as possible but in any event no longer than two minutes from the instruction being received from **NGET**, and completed within five minutes of the instruction being received from **NGET**.

(e) Each **Network Operator** must notify **NGET** in writing by calendar week 24 each year, ~~of the integral multiples it will use with effect from the succeeding Financial Year onwards.~~ for the succeeding **Financial Year** onwards, whether **Demand Control** is to be implemented either:

i) by a combination of voltage reduction and **Demand Disconnection**; or

ii) **Demand Disconnection** alone;

together with the magnitude of the voltage reduction stages (where applicable) and for **Demand Disconnection** stages, the demand reduction anticipated.

Thereafter, any changes must be notified in writing to **NGET** at least 10 **Business Days** prior to the change coming into effect.

## OC6.7 EMERGENCY MANUAL DISCONNECTION

OC6.7.1 Each **Network Operator** will make arrangements that will enable it, following an instruction from **NGET**, to disconnect **Customers** on its **User System** under emergency conditions irrespective of **Frequency** within 30 minutes. It must be possible to apply the **Demand Disconnections** to individual or specific groups of **Grid Supply Points**, as determined by **NGET**.

OC6.7.2 (a) Each **Network Operator** shall provide **NGET** in writing by week 24 in each calendar year, in respect of the next following year beginning week 24, on a **Grid Supply Point** basis, with the following information (which is set out in a tabular format in the Appendix):  
(i) its total peak **Demand** (based on **Annual ACS Conditions**); and  
(ii) the percentage value of the total peak **Demand** that can be disconnected ~~(and in the case of that in the first 5 minutes it must include that which can also be reduced by voltage reduction)~~ (and must include that which can also be reduced by voltage reduction, where applicable) within timescales of 5/10/15/20/25/30 minutes.  
(b) The information should include, in relation to the first 5 minutes, as a minimum, the 20% of **Demand** that must be reduced on instruction under OC6.5.

OC6.7.3 Each **Network Operator** will abide by the instructions of **NGET** with regard to **Disconnection** under OC6.7 without delay, and the **Disconnection** must be achieved as soon as possible after the instruction being given by **NGET**, and in any case, within the timescale registered in OC6.7.

The instruction may relate to an individual **Grid Supply Point** and/or groups of **Grid Supply Points**.

- OC6.7.4 **NGET** will notify a **Network Operator** who has been instructed under OC6.7, of what has happened on the **National Electricity Transmission System** to necessitate the instruction, in accordance with the provisions of **OC7** and, if relevant, **OC10**.
- OC6.7.5 Once a **Disconnection** has been applied by a **Network Operator** at the instruction of **NGET**, that **Network Operator** will not reconnect until **NGET** instructs it to do so in accordance with **OC6**.
- OC6.7.6 Each **Network Operator** will abide by the instructions of **NGET** with regard to reconnection under OC6.7 without delay, and shall not reconnect until it has received such instruction and reconnection must be achieved as soon as possible and the process of reconnection must begin within 2 minutes of the instruction being given by **NGET**.
- OC6.7.7 **NGET** may itself disconnect manually and reconnect **Non-Embedded Customers** as part of a **Demand Control** requirement under emergency conditions.
- OC6.7.8 If **NGET** determines that emergency manual **Disconnection** referred to in OC6.7 is inadequate, **NGET** may disconnect **Network Operators** and/or **Non-Embedded Customers** at **Grid Supply Points**, to preserve the security of the **National Electricity Transmission System**.
- OC6.7.9 Pursuant to the provisions of OC1.5.6 the **Network Operator** will supply to **NGET** details of the amount of **Demand** reduction or restoration actually achieved.

## Annex 2 - Consultation Responses

The following table provides a list of the responses received to the Grid Code Consultation GC0050.

Reference	Company
C/10-CR-01	RWE
C/10-CR-02	EDF Energy
C/10-CR-03	Electricity north West
C/10-CR-04	Northern Powergrid

## Grid Code Workgroup Consultation Response Proforma

### GC0050: Demand Control and OC6

Industry parties are invited to respond to this consultation expressing their views and supplying the rationale for those views, particularly in respect of any specific questions detailed below.

Please send your responses by **28<sup>th</sup> February 2014** to [Grid.Codes@nationalgrid.com](mailto:Grid.Codes@nationalgrid.com). Please note that any responses received after the deadline or sent to a different email address may not receive due consideration.

<b>Respondent:</b>	John Norbury Network Connections Manager RWE Supply & Trading GmbH Windmill Hill Business Park Whitehill Way Swindon SN5 6PB T +44 (0)1793 89 2667 M +44 (0)7795 354 382 <a href="mailto:john.norbury@rwe.com">john.norbury@rwe.com</a>
<b>Company Name:</b>	RWE group of UK companies, including RWE Npower plc, RWE Npower Renewables Limited and RWE Supply & Trading GmbH
<b>Do you believe that GC0050 better facilitates the appropriate Grid Code objectives?</b>	<p><i>For reference the applicable Grid Code objectives are:</i></p> <p><i>(i) to permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity;</i></p> <p><i>(ii) 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);</i></p> <p><i>(iii) 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; and</i></p>

	<p><i>(iv) 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.</i></p> <p>RWE is satisfied that the proposed change better facilitates the Grid Code objectives for the reasons given in the consultation Paper.</p>
<p><b>Do you have any additional comments?</b></p>	<p>RWE was pleased to participate in the Workgroup preceding this consultation. RWE's comments have been made via this process and RWE does not have any additional comments.</p>



Email to: [grid.code@nationalgrid.com](mailto:grid.code@nationalgrid.com)

28<sup>th</sup> February 2014

Dear Grid Code team,

### Consultation on GC0050 Demand Control and OC6

EDF Energy is one of the UK's largest energy companies with activities across the energy chain. We have interests in nuclear, coal, gas and renewable electricity generation, gas storage and energy supply to end users. We have over five million electricity and gas customer accounts in the UK, including homes and businesses.

### Summary

We are generally supportive of the proposals under consultation. The changes will provide greater clarity in the tools available in these extreme cases and certainty over their use. We note that the changes under consultation should not change anything in terms of frequency of use of voltage reduction, so that it is still used only to manage out-of-limits frequency excursions. If another change should also occur, so that the frequency of use of voltage reduction increases, then we note that a consequence of this additional change is the need to re-assess whether voltage reduction should qualify as a "system stress event" in the proposed new capacity mechanism. While this is not within scope of this change, if this did occur in the future then we would expect National Grid to carefully consider this interaction and consult with the relevant authorities.

### Response

Our response is set out in Annex 1 to this letter. Should you wish to discuss any of the issues raised in our response or have any queries, please contact Paul Mott on 0203 126 2314, or me on 01452 658415.

I confirm that this letter and its attachment may be published.

Yours sincerely,

**Mark Cox**  
Head of Transmission and Trading Arrangements

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## Annex 1

Your consultation asks these three questions:

- (i) Do you support the proposed implementation approach?**
- (ii) Do you believe that GC0050 better facilitates the appropriate Grid Code objectives?**
- (iii) Do you have any further comments?**

We find it easiest to answer these questions in relation to your core proposals, which are as italicised below (we give our views to each element, in turn)

*4.23 The Workgroup recommend ... explicitly distinguishing between Voltage Reduction and Demand Disconnection services (when Grid calls the DNO to request demand control), and to improve clarity with regard to the implementation timescales*

- We agree that the present restriction, which allows Grid to only call a DNO for "demand control", without specifying whether voltage reduction or demand disconnection is to be used, removes some element of control from Grid. The poor delivery timeframe for voltage reduction means that it is not usually able to be used in a crisis; by the time that OC6 is used, Grid generally has no choice but to call for demand disconnection.
- We agree, therefore, that grid should be able to call for voltage reduction separately, and in doing so grid can take due account of its typical delivery timeframe, and call for it in good time.
- We also agree with the workgroup's wider considerations, which seem to have been omitted from the recommendations section of the consultation (perhaps this is considered to be implicit within recommendation 4.23), to the effect that it makes sense for Grid to be permitted to call for both stages of voltage reduction at once, when the amount of demand control needed in a developing crisis, and the timing of that requirement, makes this the wise choice. Grid needs, it is evident, to be aware of the limited amount of response now available from stage 1 voltage reduction, and if the simultaneous and timely use of stage 2 can prevent demand disconnection, this would seem to be in the consumers' interest. The case for this flexibility is enhanced by the finding that where instructions for stage 1 and stage 2 voltage reduction are issued separately, significant delays are incurred by control signal "queueing" on the DNOs' SCADA networks, due to the extremely limited bandwidth of these systems.

*4.24 The Workgroup recommend that annual Voltage Reduction tests should be carried out by each DNO to confirm the demand reduction achievable via Voltage Reduction. These will be coordinated by National Grid.*

- given the recent surprising findings that have challenged previous understanding of how much demand control can be accessed, and how quickly, by voltage reduction, and given the differences from the earlier results reported to the February 2011 GCRP, we strongly support this recommendation.

*4.25 The Workgroup recommend that DNO and ENCC procedures and documentation are reviewed, and required changes implemented, to clarify that where a DNO makes Voltage Reduction services available to National Grid, the Demand Control instruction clearly states whether it requires a DNO to implement Voltage Reduction of Demand Disconnection. These changes should take effect upon implementation of Grid Code changes identified in Annex 1.*

- We agree with this recommendation

*4.26 The Workgroup recommend that the Week 24 Guidance Document published by National Grid to provide guidance to DNOs is updated to reflect these changes. In particular this will require a minor revision to section 4.2 and the proforma Table 1.2B provided by National Grid. These changes should take effect upon implementation of Grid Code changes identified in Annex 1.*

- We agree with this recommendation.

#### **Further Comments**

We have an additional point to make about Supplier energy imbalances. These changes should not affect the use of demand control as it is to be used as a last resort facility. However with these beneficial changes which make "easier" the use of demand control, and in particular voltage reduction, there is a risk that voltage reduction is used more regularly. The use of any type of demand control will cause Suppliers to incur energy imbalances, as it makes their forecasts inaccurate. It will also cause Suppliers and other parties providing demand control either as DSBR or as a form of participation in the capacity mechanism, to under-deliver or over-deliver their demand control into those mechanisms, depending on what is taken to be baseline demand. If the frequency of use changes then this matter needs to be considered carefully. Also National Grid is to have an obligation under DECC's approach to implementing EMR in terms of industry codes and transmission licences, just consulted-on, to ensure that Grid Code changes are consistent with EMR. National Grid need to ensure that they consider this matter through any changes. Early information to Suppliers will help but it could be necessary, as a result of this change, for the

commercial mechanisms to be designed so as to hold DSR providers harmless against such impacts, so that they are not penalised for something outside of their control.

We note that the changes under consultation should not change anything in terms of frequency of use of voltage reduction, so that it is still used only to manage out-of-limits frequency excursions. If another change should also occur, so that the frequency of use of voltage reduction increases, then we note that a consequence of this additional change might be that it would no longer be appropriate for voltage reduction to qualify as a "system stress event" in the proposed new capacity mechanism; we would expect, prior to such any such change, that National Grid would flag this issue to the relevant authorities.

### **Objectives**

We believe that GC0050 has the potential to better facilitate the appropriate Grid Code objectives, as long as our concerns regarding EMR and DSBR, and the possible interaction with system stress events under the capacity mechanism, are acted upon.

**EDF Energy**  
**February 2014**

## Grid Code Industry Consultation Response Proforma

### GC0050: Demand Control and OC6

Industry parties are invited to respond to this consultation expressing their views and supplying the rationale for those views, particularly in respect of any specific questions detailed below.

Please send your responses by 28 February 2014 to [Grid.Code@nationalgrid.com](mailto:Grid.Code@nationalgrid.com). Please note that any responses received after the deadline or sent to a different email address may not receive due consideration.

These responses will be included in the Report to the Authority which is drafted by National Grid and submitted to the Authority for a decision.

<b>Respondent:</b>	Anthony Pointon Electricity North West Control Room Manager <a href="mailto:anthony.pointon@enwl.co.uk">anthony.pointon@enwl.co.uk</a>
<b>Company Name:</b>	Electricity North West Limited
<b>Do you support the proposed implementation approach?</b>	Electricity North West supports the implementation approach.
<b>Do you believe that GC0050 better facilitates the appropriate Grid Code Objectives?</b>	<p><i>(i) to permit the development, maintenance and operation of an efficient, coordinated and economical system for the transmission of electricity;</i></p> <p><i>(ii) 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);</i></p> <p><i>(iii) subject to sub-paragraphs (i) and (ii), to promote the security and efficiency of the electricity generation, transmission and distribution system operator area taken as a whole; and</i></p> <p><i>(iv) 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.</i></p>

**Electricity North West Comments:**

GC0050 revises the Grid Code with achievable demand response blocks for demand response by voltage reduction. Electricity North West agrees with the observations made with respect to achievable demand response via voltage reduction and the timeframe of 10mins to implement can be achieved by Electricity North West which complies with OC6.5.3 (c).

The recent National Grid exercise 'Juniper' confirmed our response to demand control by voltage reduction. Exercise 'Juniper' demonstrated our ability to comply with the revised OC6.5.3 (II) which states: Two voltage reduction stages each of between two and four percent. Electricity North West observed during this exercise a 3% Voltage reduction equating to a 3% Demand reduction within 10 minutes of the associated SCADA instruction.

OC6.5.3 (II) The demand disconnection blocks are already embedded within the current Operational IT control systems at Electricity North West. Whilst the strategy of choosing which blocks to use for demand disconnection have not changed for many years, the blocks are regularly maintained to validate their effectiveness and each disconnection stage is expected to deliver between four and six percent demand reduction.

The rota disconnection schedules within Electricity North West are configured to comply with OC6.5.3 (d). A SCADA instruction to run a disconnection schedule will initiate immediate demand response and it is expected that a rota will be completed within the required five minutes specified under the Grid Code.

GC0050 clearly distinguishes between demand reduction by voltage control, and demand reduction by demand disconnection. The clarity of the instruction will allow Electricity North West to respond to a request with a clear objective and without the need to interpret the requirement.

The revisions to the Grid Code are already available to implement by Electricity North West if the recommendations within this review are accepted.

Electricity North West also supports the proposal for annual testing of OC6 demand reduction by voltage reduction.

Exercise 'Juniper' did not create any voltage complaints from the affected customers and allowed Electricity North West and National Grid to test their communication and capabilities.

**Do you have any additional comments?**

Electricity North West would encourage a review on how demand schedules are initiated.

An option for NGC to directly control our schedules through a SCADA link could potentially lead to a reduction in implementation time, and achieve shorter timescales for realising the objectives of OC6.5

An initiative that we are leading, CLASS (Customer Load Active System Services) is trialling new innovative techniques to control voltage and maximise the use of our electricity network. This project may offer some efficiencies relating to demand control.

## Grid Code Industry Consultation Response Proforma

### GC0050: Demand Control and OC6

Industry parties are invited to respond to this consultation expressing their views and supplying the rationale for those views, particularly in respect of any specific questions detailed below.

Please send your responses by **28 February 2014** to [Grid.Code@nationalgrid.com](mailto:Grid.Code@nationalgrid.com). Please note that any responses received after the deadline or sent to a different email address may not receive due consideration.

These responses will be included in the Report to the Authority which is drafted by National Grid and submitted to the Authority for a decision.

<b>Respondent:</b>	<i>Alan Creighton</i> <i>alan.creighton@northernpowergrid.com</i>
<b>Company Name:</b>	<i>Northern Powergrid</i>
<b>Do you support the proposed implementation approach?</b>	<i>Yes.</i>
<b>Do you believe that GC0050 better facilitates the Applicable Grid Code Objectives?</b>	<i>Yes.</i> <i>This proposal better facilitates Grid Code objectives (i) and (iii) as it makes available additional information and clarity on the capability of existing plant and equipment to assist in the operation of the transmission system during times of duress.</i>
<b>Do you have any other comments?</b>	<i>No.</i>