

All Recipients of the Serviced Grid Code

Thomas Derry  
Commercial Analyst  
Electricity Codes

[thomas.derry@uk.ngrid.com](mailto:thomas.derry@uk.ngrid.com)

Direct tel +44 (0)1926 654208

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[www.nationalgrid.com](http://www.nationalgrid.com)

Dear Sir/Madam

**THE SERVICED GRID CODE – ISSUE 4 REVISION 10**

Revision 10 of Issue 4 of the Grid Code has been approved by the Authority for implementation on **3<sup>rd</sup> January 2012**.

I have enclosed the replacement pages that incorporate the agreed changes necessary to update the Grid Code Issue 4 Revision 9 to Revision 10 standard.

The enclosed note provides a brief summary of the changes made to the text.

Yours faithfully,

Thomas Derry  
Commercial Analyst  
Electricity Codes



**THE GRID CODE – ISSUE 4 REVISION 10**

**INCLUSION OF REVISED PAGES**

Title Page

Glossary & Definitions

GD

**Pages 45 and 46**

Balancing Code 2

BC2

**Contents and Page 14**

Revisions

**NOTE:**

See Page 1 of the Revisions section of the Grid Code for details of how the revisions are indicated on the pages.

# NATIONAL GRID ELECTRICITY TRANSMISSION PLC

## THE GRID CODE – ISSUE 4 REVISION 10

### SUMMARY OF CHANGES

The changes arise from the implementation of modifications proposed in the following Consultation Paper:

#### **E/11 -** Reactive Despatch Network Restrictions

##### Summary of Proposal

This modification makes a change to the Grid Code to limit the impact of network restrictions on large embedded generators by allowing the despatching of reactive power from those generators who can provide a reactive range which includes zero MVar.

The categories of Users affected by this revision to the Grid Code are:

- National Electricity Transmission System Operator
- Embedded Generators
- Distribution Network Operators

# THE GRID CODE

**Issue 4 Revision 10**

**3<sup>rd</sup> January 2012**

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**NATIONAL GRID ELECTRICITY TRANSMISSION plc  
ELECTRICITY CODES, REGULATORY FRAMEWORKS  
NATIONAL GRID HOUSE  
WARWICK TECHNOLOGY PARK  
GALLOWS HILL  
WARWICK  
CV34 6DA**

**REGISTERED OFFICE: 1-3 Strand  
London  
WC2N 5EH**

**Quiescent Physical Notification or QPN**

Data that describes the MW levels to be deducted from the **Physical Notification** of a **BM Unit** to determine a resultant operating level to which the **Dynamic Parameters** associated with that **BM Unit** apply, and the associated times for such MW levels. The MW level of the **QPN** must always be set to zero.

**Range CCGT Module**

A **CCGT Module** where there is a physical connection by way of a steam or hot gas main between that **CCGT Module** and another **CCGT Module** or other **CCGT Modules**, which connection contributes (if open) to efficient modular operation, and which physical connection can be varied by the operator.

**Rated Field Voltage**

Shall have the meaning ascribed to that term in **IEC 34-16-1:1991** [equivalent to **British Standard BS4999** Section 116.1 : 1992].

**Rated MW**

The “rating-plate” MW output of a **Generating Unit, Power Park Module** or **DC Converter**, being:

- (a) that output up to which the **Generating Unit** was designed to operate (Calculated as specified in **British Standard BS EN 60034 – 1: 1995**); or
- (b) the nominal rating for the MW output of a **Power Park Module** being the maximum continuous electric output power which the **Power Park Module** was designed to achieve under normal operating conditions; or
- (c) the nominal rating for the MW import capacity and export capacity (if at a **DC Converter Station**) of a **DC Converter**.

**Reactive Despatch Instruction**

Has the meaning set out in the **CUSC**.

**Reactive Despatch to Zero MVAR Network Restriction**

A **Reactive Despatch Network Restriction** which prevents an **Embedded Generating Unit, Embedded Power Park Module** or **DC Converter** at an **Embedded DC Converter Station** from supplying power at zero MVAR at all **Active Power** output levels up to and including **Rated MW** at the **Grid Entry Point** (or **User System Entry Point** if **Embedded**)

**Reactive Despatch Network Restriction**

A restriction placed upon an **Embedded Generating Unit, Embedded Power Park Module** or **DC Converter** at an **Embedded DC Converter Station** by the **Network Operator** that prevents such **Embedded Generating Unit, Embedded Power Park Module** or **DC Converter** at an **Embedded DC Converter Station** from supplying power within the power factor range specified in CC.6.3.2 at the **Grid Entry Point** (or **User System Entry Point** if **Embedded**)

**Reactive Energy**

The integral with respect to time of the **Reactive Power**.

**Reactive Power**

The product of voltage and current and the sine of the phase angle between them measured in units of voltamperes reactive and standard multiples thereof, ie:

$$1000 \text{ VAr} = 1 \text{ kVAr}$$

$$1000 \text{ kVAr} = 1 \text{ Mvar}$$

**BALANCING CODE No 2**  
**POST GATE CLOSURE PROCESS**

**CONTENTS**

(This contents page does not form part of the Grid Code)

<u>Paragraph No/Title</u>	<u>Page Number</u>
BC2.1 INTRODUCTION.....	1
BC2.2 OBJECTIVE .....	1
BC2.3 SCOPE.....	2
BC2.4 INFORMATION USED.....	2
BC2.5 PHYSICAL OPERATION OF BM UNITS .....	2
BC2.5.1 Accuracy of Physical Notifications.....	2
BC2.5.2 Synchronising and De-Synchronising times .....	3
BC2.5.3 Revisions to BM Unit Data .....	4
BC2.5.4 Operation in the Absence of Instructions from NGC.....	5
BC2.5.5 Commencement or Termination of Participation in the Balancing Mechanism.....	8
BC2.6 COMMUNICATIONS.....	8
BC2.6.1 Normal Communications with Control Points .....	9
BC2.6.2 Communication with Control Points in Emergency Circumstances.....	9
BC2.6.3 Communication with Network Operators in Emergency Circumstances .....	9
BC2.6.4 Communication with Externally Interconnected System Operators in Emergency Circumstances .....	10
BC2.6.5 Communications during planned outages of electronic data communication facilities .....	10
BC2.7 BID-OFFER ACCEPTANCES.....	10
BC2.7.1 Acceptance of bids and offers by NGC .....	10
BC2.7.2 Consistency with Export and Import Limits, QPNs and Dynamic Parameters.....	11
BC2.7.3 Confirmation and Rejection of Acceptances.....	11
BC2.7.4 Action Required from BM Participants.....	12
BC2.7.5 Additional Action Required from Generators .....	12
BC2.8 ANCILLARY SERVICES.....	12
BC2.8.1 Call-off of Ancillary Services by NGC.....	12

BC2.8.2	Consistency with Export and Import Limits, QPNs and Dynamic Parameters .....	13
BC2.8.3	Rejection of Ancillary Service instructions.....	13
BC2.8.4	Action Required from BM Units.....	14
BC2.8.5	Reactive Despatch Network Restrictions .....	14
BC2.9	EMERGENCY CIRCUMSTANCES .....	14
BC2.9.1	Emergency Actions.....	14
BC2.9.2	Implementation of Emergency Instructions .....	15
BC2.9.3	Examples of Emergency Instructions .....	17
BC2.9.4	Maintaining adequate System and Localised NRAPM (Negative Reserve Active Power Margin) .....	17
BC2.9.5	Maintaining adequate Frequency Sensitive Generating Units .....	19
BC2.9.6	Emergency Assistance to and from External Systems .....	19
BC2.9.7	Unplanned Outages of electronic communication and computing facilities.....	20
BC2.10	OTHER OPERATIONAL INSTRUCTIONS AND NOTIFICATIONS.....	20
BC2.11	LIAISON WITH GENERATORS FIR RISK OF TRIP AND AVR TESTING.....	21
BC2.12	LIAISON WITH EXTERNALLY INTERCONNECTED SYSTEM OPERATORS.....	22
<b>APPENDIX 1</b>	<b>FORM OF BID-OFFER ACCEPTANCES .....</b>	<b>23</b>
<b>APPENDIX 2</b>	<b>TYPE AND FORM OF ANCILLARY SERVICE INSTRUCTIONS .....</b>	<b>25</b>
<b>APPENDIX 3</b>	<b>SUBMISSION OF REVISED Mvar CAPABILITY .....</b>	<b>30</b>
<b>APPENDIX 4</b>	<b>Submission of availability of Frequency Sensitive Mode.....</b>	<b>35</b>

- (b) **NGET** is entitled to assume that each **BM Unit** (or **Generating Unit**) is available in accordance with the **BM Unit Data** (or the **Generating Unit Data**) and data contained in the **Ancillary Services Agreement** unless and until it is informed of any changes.
- (c) **Frequency** control instructions may be issued in conjunction with, or separate from, a **Bid-Offer Acceptance**.
- (d) The form of and terms to be used by **NGET** in issuing **Ancillary Service** instructions together with their meanings are set out in Appendix 2 in the form of a non-exhaustive list of examples including **Reactive Power** and associated instructions.
- (e) In the case of **Generating Units** that do not form part of a **BM Unit** any change in **Active Power** as a result of, or required to enable, the provision of an **Ancillary Service** will be dealt with as part of that **Ancillary Service Agreement** and/or provisions under the **CUSC**.
- (f) A **System to Generator Operational Intertripping Scheme** will be armed in accordance with BC2.10.2(a)

#### BC2.8.2

#### Consistency with **Export and Import Limits, QPNs and Dynamic Parameters**

**Ancillary Service** instructions will be consistent with the **Export and Import Limits, QPNs, and Joint BM Unit Data** provided or modified under **BC1** or **BC2** and the **Dynamic Parameters** provided or modified under **BC2**. **Ancillary Service** instructions may also recognise **Other Relevant Data** provided or modified under **BC1** or **BC2**

#### BC2.8.3

#### Rejection of **Ancillary Service** instructions

- (a) **Ancillary Service** instructions may only be rejected, by automatic logging device or by telephone, on safety grounds (relating to personnel or plant) or because they are not consistent with the applicable **Export and Import Limits, QPNs, Dynamic Parameters, Joint BM Unit Data, Other Relevant Data** or data contained in the **Ancillary Services Agreement** and a reason must be given immediately for non-acceptance.
- (b) The issue of **Ancillary Service** instructions for **Reactive Power** will be made with due regard to any resulting change in **Active Power** output. The instruction may be rejected if it conflicts with any **Bid-Offer Acceptance** issued in accordance with BC2.7 or with the **Physical Notification**.
- (c) Where **Ancillary Service** instructions relating to **Active Power** and **Reactive Power** are given together, and to achieve the **Reactive Power** output would cause the **BM Unit** to operate outside **Dynamic Parameters** as a result of the **Active Power** instruction being met at the same time, then the timescale of implementation of the **Reactive Power** instruction may be extended to be no longer than the timescale for implementing the **Active Power** instruction but in any case to achieve the Mvar **Ancillary Service** instruction as soon as possible.

#### BC2.8.4 Action Required from BM Units

- (a) Each **BM Unit** (or **Generating Unit**) will comply in accordance with BC2.8.1 with all **Ancillary Service** instructions relating to **Reactive Power** properly given by **NGET** within 2 minutes or such longer period as **NGET** may instruct, and all other **Ancillary Service** instructions without delay, unless the **BM Unit** or **Generating Unit** has given notice to **NGET** under the provisions of BC2.8.3 regarding non-acceptance of **Ancillary Service** instructions.
- (b) Each **BM Unit** may deviate from the profile of its **Final Physical Notification Data**, as modified by any **Bid-Offer Acceptances** issued in accordance with BC2.7.1, only as a result of responding to **Frequency** deviations when operating in **Frequency Sensitive Mode** in accordance with the **Ancillary Services Agreement**.
- (c) Each **Generating Unit** that does not form part of a **BM Unit** may deviate from the profile of its **Final Physical Notification Data** where agreed by **NGET** and the **User**, including but not limited to, as a result of providing an **Ancillary Service** in accordance with the **Ancillary Service Agreement**.
- (d) In the event that while carrying out the **Ancillary Service** instructions an unforeseen problem arises caused by safety reasons (relating to personnel or plant), **NGET** must be notified immediately by telephone and this may lead to revision of **BM Unit Data** or **Generating Unit Data** in accordance with BC2.5.3.

#### BC2.8.5 Reactive Despatch Network Restrictions

Where **NGET** has received notification pursuant to the **Grid Code** that a **Reactive Despatch to Zero Mvar Network Restriction** is in place with respect to any **Embedded Generating Unit**, **Embedded Power Park Module** or **DC Converter** at an **Embedded DC Converter Station**, then **NGET** will not issue any **Reactive Despatch Instruction** with respect to that **Generating Unit**, **Power Park Module** or **DC Converter** until such time as notification is given to **NGET** pursuant to the **Grid Code** that such **Reactive Despatch to Zero Mvar Network Restriction** is no longer affecting that **Generating Unit**, **Power Park Module** or **DC Converter**.

### BC2.9 EMERGENCY CIRCUMSTANCES

#### BC2.9.1 Emergency Actions

BC2.9.1.1 In certain circumstances (as determined by **NGET** in its reasonable opinion) it will be necessary, in order to preserve the integrity of the **National Electricity Transmission System** and any synchronously connected **External System**, for **NGET** to issue **Emergency Instructions**. In such circumstances, it may be necessary to depart from normal **Balancing Mechanism** operation in accordance with BC2.7 in issuing **Bid-Offer Acceptances**. **BM Participants** must also comply with the requirements of **BC3**.

BC2.9.1.2 Examples of circumstances that may require the issue of **Emergency Instructions** include:-

- (a) **Events** on the **National Electricity Transmission System** or the **System** of another **User**; or
- (b) the need to maintain adequate **System** and **Localised NRAPM** in accordance with BC2.9.4 below; or

## **REVISIONS**

(This section does not form part of the Grid Code)

NGET's Transmission Licence sets out the way in which changes to the Grid Code are to be made and reference is also made to NGET's obligations under the General Conditions.

All pages re-issued have the revision number and date of the revision on the lower right hand corner of the page. The changes to the text since the previous page issue are indicated by a vertical line to the right hand side of the text. Where repagination or repositioning of the text on other pages has been found necessary but the text itself has remained unchanged the re-issued pages have only the revision number and date of the revision included.

The Grid Code was introduced in March 1990 and this first issue was revised 31 times. In March 2001 the New Electricity Trading Arrangements were introduced and Issue 2 of the Grid Code was introduced which was revised 16 times. At British Electricity Trading and Transmission Arrangements (BETTA) Go-Active Issue 3 of the Grid Code was introduced and subsequently revised 35 times. At Offshore Go-active Issue 4 of the Grid Code was introduced.

The following 'index to revisions' provides a checklist to the pages and sections of the Grid Code changed by each revision to Issue 4 of the Grid Code.

All inquiries in relation to revisions to the Grid Code, including revisions to Issues 1, 2, 3 and 4, should be addressed to the Grid Code development team at the address given at the front of the Grid Code.

Revision 1Effective Date: 10<sup>th</sup> February 2010

<b>CODE</b>	<b>PAGE</b>	<b>CLAUSE</b>
CC.A.5	80	CC.A.5.1.1 (b) replaced
CC.A.5	81	CC.A.5.3.2 added
CC.A.5	81-82	CC.A.5.5.1 amended
OC.6	8	OC6.6.1 amended
DRC	51	Schedule 12 table amended
DRC	51	Schedule 12A table added

Revision 2Effective Date: 22<sup>nd</sup> March 2010

<b>CODE</b>	<b>PAGE</b>	<b>CLAUSE</b>
G & D	8	Definition for “Commercial Boundary” added
G & D	40	Definitions for “Reactive Despatch Instruction” and “Reactive Despatch Network Restriction” added
BC2	14	Clause BC2.8.5 added
BC2	30	Clause B2.A.3.2(a) amended
BC2	32	Annex 2 amended
BC2	33	Annex 3 added
PC.A.3	30	Clause PC.A.3.1.3 amended
PC.A.3	31	Clause PC.A.3.2.1(b) amended
PC.A.3	32	Clause PC.A.3.2.2(c) amended
PC.A.3	33	Clause PC.A.3.2.2(f) amended
OC2	31 & 32	Appendix 1 and 2 amended
DRC	48	Schedule 11 amended

Revision 3Effective Date: 6<sup>th</sup> September 2010

<b>CODE</b>	<b>PAGE</b>	<b>CLAUSE</b>
CC6	18	Clause CC6.3.2 (a) amended

<b>CODE</b>	<b>PAGE</b>	<b>CLAUSE</b>
G&D	12	Definitions for “DPD I” and “DPDII” added and definition for “Detailed Planning Data” amended
PC.4	9 & 10	PC.4.4.2 amended
PC.4	10	PC.4.4.4 amended
PC.A.1	17	PC.A.1.4 amended
PC.A.5	45	PC.A.5.1.5 added
DRC	1	DRC 1.5 - New section and text
DRC	2	DRC 4.3.1 amended
DRC	9-22	DRC Schedule 1 amended
DRC	23-25	DRC Schedule 2 amended
DRC	30-38	DRC Schedule 5 amended
DRC	49-50	DRC Schedule 12 amended
DRC	57-59	DRC Schedule 15 amended
DRC	60	DRC Schedule 16 amended

<b>CODE</b>	<b>PAGE</b>	<b>CLAUSE</b>
G&D	Various	Definitions added for: “Interface Point Capacity”, “Offshore Development Information Statement”, “Offshore Tender Process”, “Offshore Works Assumptions”, “OTSDUW”, “OTSDUW Arrangements”, “OTSDUW Data and Information”, “OTSDUW DC Converter”, “OTSDUW Development and Data Timetable”, “OTSDUW Network Data and Information”, “OTSDUW Plant and Apparatus”, “OTSUA”, “OTSUA Transfer Time”, “Transmission Interface Point” and “Transmission Interface Site”
G&D	Various	Definitions amended for: “Low Voltage”, “Gas Zone Diagram”, “Network Operator”, “Offshore Transmission System”, “Operation Diagrams” and “Site Common Drawings”
PC.1	3-4	Clauses PC.1.1 and 1.4 amended and Clauses PC.1.1A and PC.1.1B added

PC.2	5-6	Clause PC.2.1 amended
PC.3	6-8	Clauses PC.3.1 and 3.4 amended
PC.4	10-12	Clauses PC.4.2, 4.3 and 4.4 amended
PC.5	14-15	Clause PC.5.4 amended
PC.6	15-16	Clause PC.6.1 Amended. Clauses PC.6.4 to 6.7 added
PC.7	17-18	Clauses 7.5, 7.6 and 7.7 amended
PC.8	18-19	Clause PC.8 added
PC.A.1	19-22	Clause PC.A.1.4 amended
PC.A.2	23-30	Clause PC.A.2.1 and 2.2 amended
PC.A.3	33, 35 & 38	Clause PC.A.3.1, 3.2 and 3.3 amended
PC.A.4	40	Clause PC.A4.1 amended
PC.A.5	56-61	Clause PC.A.5.4 amended
PC.A.6	65-69	Clauses PC.A.6.2 to 6.6 amended
PC.A.7	69-70	Clause PC.A.7 amended
PC.A.8	71-73	Clauses PC.A.8, 8.1, 8.2 and 8.3 amended
PC.F	83-85	Planning Code Appendix F added
CC.1	1	Clause CC.1.1 amended
CC.2	1	Clauses CC.2.2 – 2.4 added
CC.3	1	Clause CC.3.1 amended
CC.5	5	Clause CC.5.2 amended
CC.6	6-44	Clauses CC.6.1, 6.2, 6.3, 6.5 and 6.6 amended
CC.7	44-50	Clauses CC.7.2, 7.4 and 7.5 amended
CC.8	52	Clause CC.8.1(b) amended
CC.A.1	54	Clause CC.A.1.1 amended
CC.A.3	68-69	Clause CC.A.3.1 amended
CC.A.4A	73 -74	Clauses CC.A.4A.2 and 4A.3 amended
CC.A.7	88-93	Clauses CC.A.7.1 and A.7.2 amended
DRC	2	Schedule 11 note 3 amended

OC.11	2-5	Clauses OC.11.1, 11.2, 11.3 and 11.4 amended
GC.4	3	Clause GC.4.5 Amended

Revision 6

Effective Date: 18<sup>th</sup> July 2011

<b>CODE</b>	<b>PAGE</b>	<b>CLAUSE</b>
G&D	Various	Definitions added: "External Interconnection Circuit", "Interconnector Export Capacity", "Interconnector Import Capacity" and "Interconnector Owner".  Definitions amended "Final Generation Outage Programme", "Offshore Grid Entry Point", "Onshore Grid Entry Point" and "Output Useable or OU".
OC2	2-26	Clauses OC2.1, OC2.2, OC2.3 and OC2.4 amended
CC.6	6, 7 & 37	Clauses CC.6.1.3, CC.6.1.4 and CC.6.3.15 amended

Revision 7

Effective Date: 12<sup>th</sup> August 2011

<b>CODE</b>	<b>PAGE</b>	<b>CLAUSE</b>
OC9	4 & 9	Clauses OC9.4.6 and OC9.4.7.9 amended

Revision 8

Effective Date: 23<sup>rd</sup> September 2011

<b>CODE</b>	<b>PAGE</b>	<b>CLAUSE</b>
CC6	42 & 43	Clause CC6.5.8 amended
BC2	9 & 25	Clause BC2.6.1 and BC2.A.2.3 amended

Revision 9

Effective Date: 4<sup>th</sup> November 2011

<b>CODE</b>	<b>PAGE</b>	<b>CLAUSE</b>
OC7	14	Clause OC7.4.8.3 amended

<b>CODE</b>	<b>PAGE</b>	<b>CLAUSE</b>
BC2	14	Clause BC2.8.5 amended
G&D	45	Definition added: "Reactive Despatch to Zero MVAR Network Restriction"  Definition amended: "Reactive Despatch Network Restriction"