

Our Ref:

Your Ref:

Date: September 2004

Commercial
Industry Codes

National Grid Company plc
National Grid Transco
House
Warwick Technology Park
Gallows Hill
Warwick
CV34 6DA

To: All Recipients of the Serviced
Grid Code

Tel No: 01926 656335
Fax No: 01926 656520

Dear Sir/Madam

THE SERVICED GRID CODE - REVISION 1

Revision 1 of Issue 3 of the Grid Code has recently been approved by the Authority for implementation on **4th October 2004**.

I have enclosed the replacement pages that incorporate the agreed changes necessary to update the serviced copies of the Grid Code Issue 3 held by you to Revision 1 standard.

The enclosed note indicates the changes that are necessary to incorporate the pages and also attached is a brief summary of the changes made to the text.

Yours faithfully



D Payne
Industry Codes



Registered Office:
1-3 Strand
London
WC2N 5EH

Registered in
England and Wales
No 2366977

THE GRID CODE – ISSUE 3 REVISION 1

INCLUSION OF REVISED PAGES

Title Page

Glossary and Definitions **GD** - **Pages 19/20**

Operating Code **OC7** - **Pages 11/12**

Balancing Code **BC2** - **Pages 11 to 14**

Revisions **Page 1/2**

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 COMPANY plc

THE GRID CODE – ISSUE 3 REVISION 1

SUMMARY OF CHANGES

The changes arise from the implementation of modifications proposed in Consultation Paper **F/04** (Development of Maximum Generation Service).

1. The definition of Maximum Generation Service in the Glossary and Definitions has been amended to reflect that the service will now be utilised in accordance with the CUSC instead of the Maximum Generation Service Agreement. The definition of Maximum Generation Service has also been amended to delete the word ‘under’ from the definition.
2. There are two changes to BC2.9. The first change is to BC2.9.1.2(e), which clarifies that an instruction to generate outside of normal parameters is underpinned by Section 4 of the CUSC going forward rather than the Maximum Generation Service Agreement. The second change aligns the payment reference contained within BC2.9.2.4 with the inclusion of generic payment methodology within the CUSC.
3. OC7.4.8.5 “NGC System Warning – Inadequate System Margin” has been amended to clarify the need for some form of warning that the Maximum Generation Service maybe utilised over forthcoming Settlement Periods.

THE GRID CODE

Issue 3

Revision 1

4th October 2004

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THIS DOCUMENT IS ISSUED BY:-

**NATIONAL GRID COMPANY PLC
COMMERCIAL, INDUSTRY CODES UNIT
NATIONAL GRID TRANSCO HOUSE
WARWICK TECHNOLOGY PARK
GALLOWS HILL
WARWICK
CV34 6DA**

TEL: 01926 656335

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

<u>Key Safe</u>	A device for the secure retention of keys.
<u>Key Safe Key</u>	A key unique at a Location capable of operating a lock, other than a control lock, on a Key Safe .
<u>Large Power Station</u>	A Power Station in NGC's Transmission Area with a Registered Capacity of 100MW or more or a Power Station in SPT's Transmission Area with a Registered Capacity of 30MW or more; or a Power Station in SHETL's Transmission Area with a Registered Capacity of 5MW or more.
<u>Licence</u>	Any licence granted to NGC or a Relevant Transmission Licensee or a User , under Section 6 of the Act .
<u>Licence Standards</u>	Those standards set out or referred to in Condition C17 of NGC's Transmission Licence and/or Condition D3 of a Relevant Transmission Licensee's Transmission Licence .
<u>Limited Frequency Sensitive Mode</u>	A mode whereby the operation of the Genset is Frequency insensitive except when the System Frequency exceeds 50.4Hz, from which point Limited High Frequency Response must be provided.
<u>Limited High Frequency Response</u>	A response of a Genset to an increase in System Frequency above 50.4Hz leading to a reduction in Active Power in accordance with the provisions of BC3.7.2.
<u>Load</u>	The Active, Reactive or Apparent Power , as the context requires, generated, transmitted or distributed.
<u>Loaded</u>	Supplying electrical power to the System .
<u>Load Factor</u>	The ratio of the actual output of a Generating Unit to the possible maximum output of that Generating Unit .
<u>Load Management Block</u>	A block of Demand controlled by a Supplier or other party through the means of radio teleswitching or by some other means.
<u>Local Joint Restoration Plan</u>	A plan produced under OC9.4.7.11 detailing the agreed method and procedure by which a Genset at a Black Start Station (possibly with other Gensets at that Black Start Station) will energise part of the Total System and meet complementary blocks of local Demand so as to form a Power Island .

<u>Local Safety Instructions</u>	For safety co-ordination in England and Wales, instructions on each User Site and Transmission Site , approved by the relevant NGC or User's manager, setting down the methods of achieving the objectives of NGC's or the User's Safety Rules , as the case may be, to ensure the safety of personnel carrying out work or testing on Plant and/or Apparatus on which his Safety Rules apply and, in the case of a User , any other document(s) on a User Site which contains rules with regard to maintaining or securing the isolating position of an Isolating Device , or maintaining a physical separation or maintaining or securing the position of an Earthing Device .
<u>Localised Negative Reserve Active Power Margin or Localised NRAPM</u>	That margin of Active Power sufficient to allow transfers to and from a System Constraint Group (as the case may be) to be contained within such reasonable limit as NGC may determine.
<u>Location</u>	Any place at which Safety Precautions are to be applied.
<u>Locked</u>	A condition of HV Apparatus that cannot be altered without the operation of a locking device.
<u>Locking</u>	The application of a locking device which enables HV Apparatus to be Locked .
<u>Low Frequency Relay</u>	Has the same meaning as Under Frequency Relay .
<u>Low Voltage or LV</u>	In England and Wales a voltage not exceeding 250 volts. In Scotland, a voltage exceeding 50 voltage but not exceeding 1000 volts.
<u>Main Protection</u>	Protection equipment or system expected to have priority in initiating either a fault clearance or an action to terminate an abnormal condition in a power system.
<u>Material Effect</u>	An effect causing NGC or a Relevant Transmission Licensee to effect any works or to alter the manner of operation of Transmission Plant and/or Transmission Apparatus at the Connection Site (which term shall, in this definition and in the definition of " Modification " only, have the meaning ascribed thereto in the CUSC) or the site of connection or a User to effect any works or to alter the manner of operation of its Plant and/or Apparatus at the Connection Site or the site of connection which in either case involves that party in expenditure of more than £10,000.
<u>Maximum Generation Service, MGS</u>	A service utilised by NGC in accordance with the CUSC and the Balancing Principles Statement in operating the Total System .
<u>Maximum Generation Service Agreement</u>	An agreement between a User and NGC for the payment by NGC to that User in respect of the provision by such User of a Maximum Generation Service .

OC7.4.8.3 Preparatory Action

- (a) Where possible, and if required, recipients of the warnings should take such preparatory action as they deem necessary taking into account the information contained in the **GB Transmission System Warning**. All warnings will be of a form determined by **NGC** and will remain in force from the stated time of commencement until the cancellation, amendment or re-issue, as the case may be, is notified by **NGC**.
- (b) Where a **GB Transmission System Warning** has been issued to a **Network Operator** and is current, **Demand Control** should not (subject as provided below) be employed unless instructed by **NGC**. If **Demand Control** is, however, necessary to preserve the integrity of the **Network Operator's System**, then the impact upon the integrity of the **Total System** should be considered by the **Network Operator** and where practicable discussed with **NGC** prior to its implementation.

Where a **GB Transmission System Warning** has been issued to a **Supplier**, further **Customer Demand Management** (in addition to that previously notified under **OC1 - Demand Forecasts**) must only be implemented following notification to **NGC**.

- (c) **GB Transmission System Warnings** will be issued by fax, to the facsimile number(s) and locations agreed between **NGC** and **Users**, or by such electronic data transmission facilities as have been agreed. In the case of **Generators** with **Gensets** this will normally be at their **Trading Points** (if they have notified **NGC** that they have a **Trading Point**)
- (d) **Users** may at times be informed by telephone or other means of **GB Transmission System Warnings** and in these circumstances confirmation will be sent to those **Users** so notified, by fax as soon as possible.

OC7.4.8.4 Types of GB Transmission System Warnings

GB Transmission System Warnings consist of the following types:-

- (i) **GB Transmission System Warning - Inadequate System Margin**
- (ii) **GB Transmission System Warning - High Risk of Demand Reduction**
- (iii) **GB Transmission System Warning - Demand Control Imminent**
- (iv) **GB Transmission System Warning - Risk of System Disturbance**

OC7.4.8.5 GB Transmission System Warning - Inadequate System Margin

A **GB Transmission System Warning - Inadequate System Margin** may be issued to **Users** in accordance with OC7.4.8.2, at times when there is inadequate **System Margin**, as determined under BC1.5.4. It will contain the following information:

- (i) the period for which the warning is applicable; and
- (ii) the availability shortfall in MW; and

- (iii) intended consequences for **Users**, including notification that **Maximum Generation Service** may be instructed.

OC 7.4.8.6 **GB Transmission System Warning - High Risk of Demand Reduction**

- (a) A **GB Transmission System Warning - High Risk of Demand Reduction** may be issued to **Users** in accordance with OC7.4.8.2 at times when there is inadequate **System Margin**, as determined under BC1.5.4 and in **NGC's** judgement there is increased risk of **Demand** reduction being implemented under OC6.5.1. It will contain the following information in addition to the required information in a **GB Transmission System Warning - Inadequate System Margin**:
 - (i) the possible percentage level of **Demand** reduction required; and
 - (ii) Specify those **Network Operators** and **Non Embedded Customers** who may subsequently receive instructions under OC6.5.1.
- (b) A **GB Transmission System Warning - High Risk of Demand Reduction** may also be issued by **NGC** to those **Network Operators** and **Non Embedded Customers** who may subsequently receive instructions under OC6.5.1 relating to a **Demand** reduction in circumstances not related to inadequate **System Margin** (for example **Demand** reduction required to manage **System** overloading).

The **GB Transmission System Warning - High Risk of Demand Reduction** will specify the period during which **Demand** reduction may be required and the part of the **Total System** to which it applies and any other matters specified in OC6.5.

OC7.4.8.6.1 **Protracted Periods of Generation Shortage**

- (a) Whenever **NGC** anticipates that a protracted period of generation shortage may exist a **GB Transmission System Warning - Inadequate System Margin** or **High Risk of Demand Reduction** may be issued, to give as much notice as possible to those **Network Operators** and **Non Embedded Customers** who may subsequently receive instructions under OC6.5.
- (b) A **GB Transmission System Warning - High Risk of Demand Reduction** will in these instances include an estimate of the percentage of **Demand** reduction that may be required and the anticipated duration of the **Demand** reduction. It may also include information relating to estimates of any further percentage of **Demand** reduction that may be required.
- (c) The issue of the **GB Transmission System Warning - Inadequate System Margin** or **High Risk of Demand Reduction** is intended to enable recipients to plan ahead on the various aspects of **Demand** reduction.

OC7.4.8.7 **GB Transmission System Warning - Demand Control Imminent**

- (a) A **GB Transmission System Warning - Demand Control Imminent**, relating to a **Demand** reduction under OC6.5, will be issued by **NGC** to

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** will comply in accordance with BC2.8.1 with all **Ancillary Service** instructions relating to **Reactive Power** properly given by **NGC** within 2 minutes or such longer period as **NGC** may instruct, and all other **Ancillary Service** instructions without delay, unless the **BM Unit** has given notice to **NGC** 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) In the event that while carrying out the **Ancillary Service** instructions an unforeseen problem arises caused by safety reasons (relating to personnel or plant), **NGC** must be notified immediately by telephone and this may lead to revision of **BM Unit Data** in accordance with BC2.5.3.

BC2.9 EMERGENCY CIRCUMSTANCES

BC2.9.1 Emergency Actions

- BC2.9.1.1 In certain circumstances (as determined by **NGC** in its reasonable opinion) it will be necessary, in order to preserve the integrity of the **GB Transmission System** and any synchronously connected **External System**, for **NGC** 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 **GB 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
- (c) the need to maintain adequate frequency sensitive **Generating Units** in accordance with BC2.9.5 below; or
- (d) the need to implement **Demand Control** in accordance with OC6; or
- (e) (i) the need to invoke the **Black Start** process or the **Re-Synchronisation of De-Synchronised Island** process in accordance with OC9; or
(ii) the need to request provision of a **Maximum Generation Service**.

BC2.9.1.3 In the case of **BM Units** in **Great Britain**, **Emergency Instructions** will be issued by **NGC** direct to the **User** at the **Control Point** for the **BM Unit** and may require an action or response which is outside its **Other Relevant Data**, **QPNs**, or **Export and Import Limits** submitted under **BC1**, or revised under **BC1** or **BC2**, or **Dynamic Parameters** submitted or revised under **BC2**.

BC2.9.1.4 In the case of a **Network Operator** or an **Externally Interconnected System Operator**, **Emergency Instructions** will be issued to its **Control Centre**.

BC2.9.2 Implementation of Emergency Instructions

BC2.9.2.1 **Users** will respond to **Emergency Instructions** issued by **NGC** without delay and using all reasonable endeavours to so respond. **Emergency Instructions** may only be rejected by an **User** on safety grounds (relating to personnel or plant) and this must be notified to **NGC** immediately by telephone.

BC2.9.2.2 **Emergency Instructions** will always be prefixed with the words "This is an **Emergency Instruction**" except in the case of **Maximum Generation Service** instructed by electronic data communication facilities where the instruction will be issued in accordance with the provisions of the **Maximum Generation Service Agreement**.

BC2.9.2.3 In all cases under this BC2.9 except BC2.9.1.2 (e) where **NGC** issues an **Emergency Instruction** to a **BM Participant** which is not rejected under BC2.9.2.1, the **Emergency Instruction** shall be treated as a **Bid-Offer Acceptance**. For the avoidance of doubt, any **Emergency Instruction** issued to a **Network Operator** or to an **Externally Interconnected System Operator** will not be treated as a **Bid-Offer Acceptance**.

BC2.9.2.4 In the case of BC2.9.1.2 (e) (ii) where **NGC** issues an **Emergency Instruction** pursuant to a **Maximum Generation Service Agreement** payment will be dealt with in accordance with the **CUSC** and the **Maximum Generation Service Agreement**.

BC2.9.3 Examples of **Emergency Instructions**

BC2.9.3.1 In the case of a **BM Unit**, **Emergency Instructions** may include an instruction for the **BM Unit** to operate in a way that is not consistent with the **Dynamic Parameters**, **QPNs** and/or **Export and Import Limits**.

BC2.9.3.2 In the case of a **Generator**, **Emergency Instructions** may include:

- (a) an instruction to trip one or more **Gensets**; or
- (b) an instruction to trip **Mills** or to **Part Load a Generating Unit**; or
- (c) an instruction to **Part Load a CCGT Module**; or
- (d) an instruction for the operation of **CCGT Units** within a **CCGT Module** (on the basis of the information contained within the **CCGT Module Matrix**) when emergency circumstances prevail (as determined by **NGC** in **NGC's** reasonable opinion); or
- (e) an instruction to generate outside normal parameters, as allowed for in 4.2 of the **CUSC**.

BC2.9.3.3 Instructions to **Network Operators** relating to the **Operational Day** may include:

- (a) a requirement for **Demand** reduction and disconnection or restoration pursuant to **OC6**;
- (b) an instruction to effect a load transfer between **Grid Supply Points**;
- (c) an instruction to switch in a **System to Demand Intertrip Scheme**;
- (d) an instruction to split a network;
- (e) an instruction to disconnect an item of **Plant** or **Apparatus** from the **System**.

BC2.9.4 Maintaining adequate **System** and **Localised NRAPM (Negative Reserve Active Power Margin)**

BC2.9.4.1 Where **NGC** is unable to satisfy the required **System NRAPM** or **Localised NRAPM** by following the process described in BC1.5.5, **NGC** will issue an **Emergency Instruction** to exporting **BM Units** for **De-Synchronising** on the basis of **Bid-Offer Data** submitted to **NGC** in accordance with BC1.4.2(d).

BC2.9.4.2 In the event that **NGC** is unable to differentiate between exporting **BM Units** according to **Bid-Offer Data**, **NGC** will instruct a **BM Participant** to **Shutdown** a specified exporting **BM Unit** for such period based upon the following factors:

- (a) effect on power flows (resulting in the minimisation of transmission losses);
- (b) reserve capability;
- (c) **Reactive Power** worth;
- (d) **Dynamic Parameters**;

(e) in the case of **Localised NRAPM**, effectiveness of output reduction in the management of the **System Constraint**.

BC2.9.4.3 Where **NGC** is still unable to differentiate between exporting **BM Units**, having considered all the foregoing, **NGC** will decide which exporting **BM Unit** to **Shutdown** by the application of a quota for each **BM Participant** in the ratio of each **BM Participant's Physical Notifications**.

BC2.9.4.4 Other than as provided in BC2.9.4.5 and BC2.9.4.6 below, in determining which exporting **BM Units** to **De-Synchronise** under this BC2.9.4, **NGC** shall not consider in such determination (and accordingly shall not instruct to **De-Synchronise**) any **Generating Unit** within an **Existing Gas Cooled Reactor Plant**.

BC2.9.4.5 **NGC** shall be permitted to instruct a **Generating Unit** within an **Existing AGR Plant** to **De-Synchronise** if the relevant **Generating Unit** within the **Existing AGR Plant** has failed to offer to be flexible for the relevant instance at the request of **NGC** within the **Existing AGR Plant Flexibility Limit**.

BC2.9.4.6 Notwithstanding the provisions of BC2.9.4.5 above, if the level of **System NRAPM** (taken together with **System** constraints) or **Localised NRAPM** is such that it is not possible to avoid instructing a **Generating Unit** within an **Existing Magnox Reactor Plant** and/or an **Existing AGR Plant** whether or not it has met requests within the **Existing AGR Flexibility Limit** to **De-Synchronise** **NGC** may, provided the power flow across each **External Interconnection** is either at zero or results in an export of power from the **Total System**, so instruct a **Generating Unit** within an **Existing Magnox Reactor Plant** and/or an **Existing AGR Plant** to **De-Synchronise** in the case of **System NRAPM**, in all cases and in the case of **Localised NRAPM**, when the power flow would have a relevant effect.

BC2.9.4.7 When instructing exporting **BM Units** which form part of an **On-Site Generator Site** to reduce generation under this BC2.9.4, **NGC** will not issue an instruction which would reduce generation below the reasonably anticipated **Demand** of the **On-Site Generator Site**. For the avoidance of doubt, it should be noted that the term "**On-Site Generator Site**" only relates to Trading Units which have fulfilled the Class 1 or Class 2 requirements.

BC2.9.5 Maintaining adequate Frequency Sensitive **Generating Units**

BC2.9.5.1 If, post **Gate Closure**, **NGC** determines, in its reasonable opinion, from the information then available to it (including information relating to **Generating Unit** breakdown) that the number of and level of **Primary, Secondary and High Frequency Response** available from **Gensets** (other than those units within **Existing Gas Cooled Reactor Plant**, which are permitted to operate in **Limited Frequency Sensitive Mode** at all times under BC3.5.3) available to operate in **Frequency Sensitive Mode** is such that it is not possible to avoid **De-Synchronising Existing Gas Cooled Reactor Plant** then provided that:

- (a) there are (or, as the case may be, that **NGC** anticipates, in its reasonable opinion, that at the time that the instruction is to take effect there will be) no other **Gensets** generating and exporting on to the **Total System** which are not operating in **Frequency Sensitive Mode** (or which are operating with only a nominal amount in terms of level and duration) (unless, in **NGC's** reasonable opinion, necessary to assist the relief of **System** constraints or necessary as a result of other **System** conditions); and

REVISIONS

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

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

In order to ensure that Users have access to a current version of the Grid Code, Users who have purchased a serviced copy of the Grid Code receive a set of replacement pages containing the revisions made to the Grid Code pursuant to the Transmission Licence. Unserviced copies are not so updated but each unserviced copy issued is accompanied by all revisions since the date the unserviced version of the Grid Code was last reprinted.

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.

The following 'index to revisions' provides a checklist to the pages and sections of the Grid Code changed by each revision to Issue 3 of the Grid Code.

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

CODE	PAGE	CLAUSE
GD	20	Maximum Generation Service definition revised
OC7	12	OC7.4.8.5 (iii) amended to include MGS notification
BC2	12	BC2.9.2.4 amended to include reference to CUSC
BC2	13	BC2.9.3.2 (e) amended to include reference to CUSC and remove reference to MGS