

All Recipients of the Serviced Grid Code

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Dear Sir/Madam

THE SERVICED GRID CODE – ISSUE 4 REVISION 3

Revision 3 of Issue 4 of the Grid Code has been approved by the Authority for implementation on **6th September 2010**.

I have enclosed the replacement pages that incorporate the agreed changes necessary to update the Grid Code Issue 4 to Revision 3 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 3

INCLUSION OF REVISED PAGES

Title Page

Connection Conditions

CC6.3 - **Page 18 & 19**

Revisions

- **Pages 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 ELECTRICITY TRANSMISSION PLC

THE GRID CODE – ISSUE 4 REVISION 3

SUMMARY OF CHANGES

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

G/09 - Grid Code Short Circuit requirement in respect of very Large Synchronous Generating Units

Summary of Proposal

The G/09 change proposal was raised in response to the concerns of a number of generators hoping to utilise new technology (in particular new nuclear) for which generating units with rated output of up to 2000MVA have been proposed. These generating units are not available with an SCR of 0.5 or above.

The Grid Code has been amended to specify that the SCR must not be less than 0.4 for units with apparent power output of 1600MVA or greater. For units with apparent power output of less than 1600MVA the SCR must not be less than 0.5 (as is currently required).

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

- Directly connected Generators

THE GRID CODE

Issue 4 Revision 3

6th September 2010

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CC.6.3 GENERAL GENERATING UNIT REQUIREMENTS

CC.6.3.1 This section sets out the technical and design criteria and performance requirements for **Generating Units, DC Converters and Power Park Modules** (whether directly connected to the **National Electricity Transmission System** or **Embedded**) which each **Generator** or **DC Converter Station** owner must ensure are complied with in relation to its **Generating Units, DC Converters and Power Park Modules** but does not apply to **Small Power Stations** or individually to **Power Park Units**. References to **Generating Units, DC Converters and Power Park Modules** in this CC.6.3 should be read accordingly.

Plant Performance Requirements

CC.6.3.2 (a) When supplying **Rated MW** all **Onshore Synchronous Generating Units** must be capable of continuous operation at any point between the limits 0.85 **Power Factor** lagging and 0.95 **Power Factor** leading at the **Onshore Synchronous Generating Unit** terminals. At **Active Power** output levels other than **Rated MW**, all **Onshore Synchronous Generating Units** must be capable of continuous operation at any point between the **Reactive Power** capability limits identified on the **Generator Performance Chart**.

In addition to the above paragraph, where **Onshore Synchronous Generating Unit(s)**:

- (i) have a **CEC** which has been increased above **Rated MW** (or the **CEC** of the **CCGT module** has increased above the sum of the **Rated MW** of the **Generating Units** comprising the **CCGT module**), and such increase takes effect after 1st May 2009, the minimum lagging **Reactive Power** capability at the terminals of the **Onshore Synchronous Generating Unit(s)** must be 0.9 **Power Factor** at all **Active Power** output levels in excess of **Rated MW**. Further, the **User** shall comply with the provisions of and any instructions given pursuant to BC1.8 and the relevant **Bilateral Agreement**: or
- (ii) Have a **CEC** in excess of **Rated MW** (or the **CEC** of the **CCGT module** exceeds the sum of **Rated MW** of the **Generating Units** comprising the **CCGT module**) and a **Completion Date** before 1st May 2009, alternative provisions relating to **Reactive Power** capability may be specified in the **Bilateral Agreement** and where this is the case such provisions must be complied with.

The short circuit ratio of **Onshore Synchronous Generating Units** with an **Apparent Power** rating of less than 1600MVA shall be not less than 0.5. The short circuit ratio of **Onshore Synchronous Generating Units** with a rated **Apparent Power** of 1600MVA or above shall be not less than 0.4.

(b) Subject to paragraph (c) below, all **Onshore Non-Synchronous Generating Units, Onshore DC Converters and Onshore Power Park Modules** must be capable of maintaining zero transfer of **Reactive Power** at the **Onshore Grid Entry Point** (or **User System Entry Point** if **Embedded**) at all **Active Power** output levels under steady state voltage conditions. For **Onshore Non-Synchronous Generating Units and Onshore Power Park Modules** the steady state tolerance on **Reactive Power** transfer to and from the **National Electricity Transmission System** expressed in MVA_r shall be no greater than 5% of the **Rated MW**. For **Onshore DC Converters** the steady state tolerance on **Reactive Power** transfer to and from the **National Electricity Transmission System** shall be specified in the **Bilateral Agreement**.

- (c) Subject to the provisions of CC.6.3.2(d) below, all **Onshore Non-Synchronous Generating Units, Onshore DC Converters** (excluding current source technology) and **Onshore Power Park Modules** (excluding those connected to the **Total System** by a current source **Onshore DC Converter**) with a **Completion Date** on or after 1 January 2006 must be capable of supplying **Rated MW** output at any point between the limits 0.95 **Power Factor** lagging and 0.95 **Power Factor** leading at the **Onshore Grid Entry Point** in England and Wales or at the HV side of the 33/132kV or 33/275kV or 33/400kV transformer for **Generators** directly connected to the **Onshore Transmission System** in Scotland (or **User System Entry Point** if **Embedded**). With all **Plant** in service, the **Reactive Power** limits defined at **Rated MW** at Lagging **Power Factor** will apply at all **Active Power** output levels above 20% of the **Rated MW** output as defined in Figure 1. With all **Plant** in service, the **Reactive Power** limits defined at **Rated MW** at Leading **Power Factor** will apply at all **Active Power** output levels above 50% of the **Rated MW** output as defined in Figure 1. With all **Plant** in service, the **Reactive Power** limits will reduce linearly below 50% **Active Power** output as shown in Figure 1 unless the requirement to maintain the **Reactive Power** limits defined at **Rated MW** at Leading **Power Factor** down to 20% **Active Power** output is specified in the **Bilateral Agreement**. These **Reactive Power** limits will be reduced pro rata to the amount of **Plant** in service.

of such **Scottish Users** with effect from 11:00 hours on the day prior to **Go-Live**

- (b) Notwithstanding (a) above, **Scottish Users** may submit data for **Go-Live** 3 days in advance of **Go-Live** on the basis set out in the **Data Validation, Consistency and Defaulting Rules** which shall apply to **Scottish Users** and **NGET** in respect of such **Scottish Users** on that basis and for such purpose.
- (c) The **Operational Day** for the purposes of any submissions by **Scottish Users** prior to **Go-Live** under a) and b) above for the day of **Go-Live** shall be 00:00 hours on **Go Live** to 05:00 hours on the following day.
- (d) The provisions of **BC2** shall apply to and be complied with by **Scottish Users** and by **NGET** in respect of such **Scottish Users** with effect from 23:00 hours on the day prior to **Go-Live**.
- (e) The provisions of **OC7.4.8** shall apply to and be complied with by **Scottish Users** and by **NGET** in respect of such **Scottish Users** with effect from 11:00 hours on the day prior to **Go-Live**.
- (f) In order to facilitate cut-over, **Scottish Users** acknowledge and agree that **NGET** will exchange data submitted by such **Scottish Users** under **BC1** prior to Go-Live with the Scottish system operators to the extent necessary to enable the cut-over.
- (g) Except in the case of **Reactive Power**, **Scottish Users** should only provide **Ancillary Services** from **Go-Live** where they have been instructed to do so by **NGET**. In the case of **Reactive Power**, at **Go-Live** a **Scottish Users** Mvar output will be deemed to be the level instructed by **NGET** under **BC2**, following this **Scottish Users** should operate in accordance with **BC2.A.2.6** on the basis that Mvar output will be allowed to vary with system conditions.

< End of GC >

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: 10th February 2010

CODE	PAGE	CLAUSE
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: 22nd March 2010

CODE	PAGE	CLAUSE
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: 6th September 2010

CODE	PAGE	CLAUSE
CC6	18	Clause CC6.3.2 (a) amended