

NATIONAL GRID COMPANY PLC

GRID CODE REVIEW PANEL

REVIEW OF GRID CODE OPERATING CODE OC1

INTRODUCTION

1. This paper is concerned with a review of OC1 – Demand Forecasting which NGC has undertaken.
2. Grid Code **OC1** is primarily concerned with Demand forecasting for operational purposes. In order to match generation with Demand for electricity it is necessary for NGC to undertake Demand Forecasting. It is also necessary to undertake Demand Forecasting of Reactive Power.

REVIEW OF OC1

3. The aim of this review has been to identify areas of OC1 which would benefit from clarification to reflect more fully developments in practice, although it has also considered certain changes which if introduced would go wider than that. These are referred to in paragraph 5 below.

It is thought sensible to progress the former as soon as possible, as that would result in the Grid Code being in a better form to be developed into the GB Grid Code as part of the BETTA process. The other changes can be developed in due course.

PROPOSED CHANGES

4. The proposed changes identified as clarification are indicated in the change marked version of OC1 attached as an appendix to this paper. Briefly the proposed changes are as follows:
 - OC1 Introduction – clarification that National Grid undertakes Demand Forecasting based on historical information collected from operational metering as well as information furnished by Users.
 - OC1 Objectives – clarification that the information provided enables NGC to produce Demand forecasts in the Operational Planning Phase as well as other timescales and also to facilitate provision of certain demand data by NGC under in accordance with the Grid Code.
 - Factors taken into account – recognition that station demand may be taken into account and recognition that anticipated market prices are no longer a factor.
 - Clarification that NGC retains records of the use of mathematical models for the preceding 12 months.
 - In order to clarify ambiguity for data requirement in the Operational Planning phase in OC1.4.2(a) will change to User
 - Other minor text changes for clarification.

5. In addition to the proposed changes identified above there is a need to review the time-scales and quantity of information received from Medium Embedded Power Stations. National Grid believes that rather than receiving data on a half-hourly basis in day ahead and week ahead time-scales, it would be preferable to receive data on cardinal point basis in time-scales commensurate with OC2.4.1.2.2. However, it is recognised that this issue is covered by the Terms of Reference of the Embedded Power Stations Working Group and is dependent on the progress made by that working group. It is therefore not being dealt with in this paper, but will be raised separately in due course as part of any proposals arising from the Embedded Power Station Working Group discussions.

TIME-SCALES

6. In order to progress the proposed changes, National Grid proposes that following discussion at the Grid Code Review Panel Meeting, a wider consultation on the proposed changes is carried out in early June 2003, following any further discussion with Panel Members after the Meeting as necessary.

WAY FORWARD

7. GCRP members are invited:
 - To consider the proposed changes described in this paper;
 - To provide any comments at the Grid Code Review Panel Meeting.

National Grid Company plc.
8th May 2003

OPERATING CODE NO. 1

Based on Revision 8

DEMAND FORECASTS

- OC1.1 INTRODUCTION
- OC1.1.1 **Operating Code No.1 ("OC1")** is concerned with **Demand** forecasting for operational purposes. In order to match generation output with **Demand** for electricity it is necessary to undertake **Demand** forecasting. It is also necessary to undertake **Demand** forecasting of **Reactive Power**.
- OC1.1.2 In the **Operational Planning Phase**, **Programming Phase and Control Phase**, **Demand** forecasting shall be conducted by **NGC** taking account of historical **Demand** information collected by **NGC** from operational metering, **Demand** forecasts furnished by **Network Operators** the factors referred to in OC1.6.1 and in certain circumstances, furnished by **Generators**, who shall provide **NGC** with information in the form set out in this **OC1**. The data supplied under the **PC** is also taken into account.
- ~~OC1.1.3 In the **Programming Phase and Control Phase**, **NGC** will conduct its own **Demand** forecasting taking into account information to be furnished by **Suppliers**, **Network Operators** and by **Generators** and the other factors referred to in OC1.6.1.~~
- OC1.1.43 In this **OC1**, the point of connection of the **External Interconnection** to the **NGC Transmission System** shall be considered as a **Grid Supply Point**. **Reactive Power Demand** includes the series **Reactive** losses of the **User's System** but excludes any network susceptance and any **Reactive** compensation on the **User's System**. **NGC** will obtain the lumped network susceptance and details of **Reactive** compensation from the requirements to submit data under the **PC**.
- OC1.1.54 Data relating to **Demand Control** should include details relating to MW.
- OC1.1.65 **OC1** deals with the provision of data on **Demand Control** in the **Operational Planning Phase**, the **Programming Phase** and the **Post-Control Phase**, whereas **OC6** (amongst other things) deals with the provision of data on **Demand Control** following the **Programming Phase** and in the **Control Phase**.
- OC1.1.76 In this **OC1**, Year 0 means the current **NGC Financial Year** at any time, Year 1 means the next **NGC Financial Year** at any time, Year 2 means the **NGC Financial Year** after Year 1, etc.
- OC1.1.87 References in **OC1** to data being supplied on a half hourly basis refer to it being supplied for each period of 30 minutes ending on the hour and half-hour in each hour.

OC1.2 OBJECTIVE

The objectives of **OC1** are to:

OC1.2.1 ~~enable the provision of data to NGC by Users in the Programming Phase, Control Phase and Post-Control Phase~~ enable NGC to produce Demand forecasts in the Operational Planning Phase, Programming Phase and Control Phase taking the factors listed in OC1.6.1 into account and making use of data provided by Users and that held by NGC; and

OC1.2.2 ~~provide for the factors to be taken into account by NGC when Demand forecasting in the Programming Phase and Control Phase~~ facilitate ultimately the provision of Demand forecasts to Users in accordance with the Grid Code.

OC1.3 SCOPE

OC1 applies to **NGC** and to **Users** which in this **OC1** means:-

- (a) **Generators,**
- (b) **Network Operators,** and
- (c) **Suppliers.**

OC1.4 DATA REQUIRED BY NGC IN THE OPERATIONAL PLANNING PHASE

OC1.4.1 (a) Each **User**, as specified in (b) below, shall provide **NGC** with the data requested in OC1.4.2 below.

(b) The data will need to be supplied by:-

- (i) each **Network Operator** directly connected to the **NGC Transmission System** in relation to **Demand Control**; and
- (ii) each **Generator** with respect to the output of **Medium Power Stations**.

OC1.4.2 (a) Data
By calendar week 28 each year each ~~Network Operator~~**User** will provide to **NGC** in writing the forecast information listed in (c) below for the current **NGC Financial Year** and each of the succeeding five **NGC Financial Years**.

(b) Data Providers
In circumstances when the busbar arrangement at a **Grid Supply Point** is expected to be operated in separate sections, separate sets of forecast information for each section will be provided to **NGC**.

(c) Medium Power Station Output and Demand Control:
For the ~~specified~~ time of the annual peak half hour **NGC Demand**, as specified by **NGC** under PC.A.5.2.2, ~~the output of Medium Power Stations (whether Embedded or not) and forecasts of Demand to be relieved by Demand Control on a Grid Supply Point basis giving details of the amount and duration of the Demand Control.~~

(i) the output of **Medium Power Stations** (whether **Embedded** or not);
and

(ii) forecasts of **Demand** to be relieved by **Demand Control** on a **Grid Supply Point** basis giving details of the amount and duration of the **Demand Control**.

OC1.5 DATA REQUIRED BY NGC IN THE PROGRAMMING PHASE, CONTROL PHASE and POST-CONTROL PHASE

OC1.5.1 Programming Phase

For the period of 2 to 8 weeks ahead the following will be supplied to **NGC** in writing by 1000 hours each Monday:

- (a) **Demand Control:**
Each **Network Operator** will supply MW profiles of the amount and duration of their proposed use of **Demand Control** which may result in a **Demand** change of 12MW or more (averaged over any half hour on any **Grid Supply Point**) on a half hourly and **Grid Supply Point** basis;
- (b) **Medium Power Station Operation:**
Each **Generator** will, if reasonably required by **NGC**, supply MW schedules for the operation of **Medium Power Stations** on a half hourly and **Grid Supply Point** basis.

OC1.5.2 For the period 2 to ~~42~~14 days ahead the following will be supplied to **NGC** in writing by 1200 hours each Wednesday:

- (a) **Demand Control:**
Each **Network Operator** will supply MW profiles of the amount and duration of their proposed use of **Demand Control** which may result in a **Demand** change of 12MW or more (averaged over any half hour on any **Grid Supply Point**) on a half hourly and **Grid Supply Point** basis;
- (b) **Medium Power Station Operation:**
Each **Generator** will, if reasonably required by **NGC**, supply MW schedules for the operation of **Medium Power Stations** on a half hourly and **Grid Supply Point** basis.

OC1.5.3 Medium Power Station Output:

Each **Generator** will, if reasonably required by **NGC**, supply **NGC** with MW schedules for the operation of **Medium Power Stations** on a half hourly and **Grid Supply Point** basis in writing by 1000 hours each day (or such other time specified by **NGC** from time to time) for the next day (except that it will be for the next 3 days on Fridays and 2 days on Saturdays and may be longer (as specified by **NGC** at least one week in advance) to cover holiday periods);

OC1.5.4 Other Codes

Under **OC6** each **Network Operator** will notify **NGC** of their proposed use of **Demand Control** (which may result in a **Demand** change of 12MW or more), and under **BC1**, each **Supplier** will notify **NGC** of their proposed use of **Customer Demand Management** (which may result in a **Demand** change of 12MW or more) in this timescale.

OC1.5.5 **Control Phase**

OC1.5.5.1 **Demand Control:**

Under **OC6**, each **Network Operator** will notify **NGC** of any **Demand Control** proposed by itself which may result in a **Demand** change of 12MW or more averaged over any half hour on any **Grid Supply Point** which is planned after 1000 hours, and of any changes to the planned **Demand Control** notified to **NGC** prior to 1000 hours as soon as possible after the formulation of the new plans;

OC1.5.5.2 **Customer Demand Management:**

(a) Each **Supplier** will notify **NGC** of any **Customer Demand Management** proposed by itself which may result in a **Demand** change of 12MW or more averaged over any half hour on any **Grid Supply Point** which is planned to occur at any time in the **Control Phase** and of any changes to the planned **Customer Demand Management** already notified to **NGC** as soon as possible after the formulation of the new plans.

(b) The following information is required on a **Grid Supply Point** and half-hourly basis:-

- (i) the proposed date, time and duration of implementation of **Customer Demand Management**; and
- (ii) the proposed reduction in **Demand** by use of **Customer Demand Management**.

OC1.5.6 **Post-Control Phase**

The following will be supplied to **NGC** in writing by 0600 hours each day in respect of **Active Power** data and by 1000 hours each day in respect of **Reactive Power** data:

(a) **Demand Control:**

Each **Network Operator** will supply MW profiles for the previous calendar day of the amount and duration of **Demand** reduction achieved by itself from the use of **Demand Control** of 12MW or more (averaged over any half hour on any **Grid Supply Point**), on a half hourly and **Grid Supply Point** basis.

(b) **Customer Demand Management:**

Each **Supplier** will supply MW profiles of the amount and duration of **Demand** reduction achieved by itself from the use of **Customer Demand Management** of 12MW or more (averaged over any half hour on any **Grid Supply Point**) on a half hourly and **Grid Supply Point** basis during the previous calendar day.

OC1.6 **NGC FORECASTS**

OC1.6.1 The following factors will be taken into account by **NGC** when conducting **NGC Demand** forecasting in the **Programming Phase** and **Control Phase**:

- (a) Historic **Demand** data (this includes **NGC Transmission System** losses).

- (b) Weather forecasts and the current and historic weather conditions.
- (c) The incidence of major events or activities which are known to **NGC** in advance.
- (d) Anticipated interconnection flows across **External Interconnections**.
- (e) **Demand Control** of 12MW or more (averaged over any half hour at any **Grid Supply Point**) proposed to be exercised by **Network Operators** and of which **NGC** has been informed.
- (f) **Customer Demand Management** of 12MW or more (averaged over any half hour at any **Grid Supply point**) proposed to be exercised by **Suppliers** and of which **NGC** has been informed.
- (g) Other information supplied by **Users**.
- (h) Anticipated **Pumped Storage Unit** demand.
- (i) ~~the sensitivity of Demand to anticipated market prices for electricity~~ Station demand.
- (j) **BM Unit Data** submitted by **BM Participants** to **NGC** in accordance with the provisions of **BC1** and **BC2**

OC1.6.2 Taking into account the factors specified in OC1.6.1 **NGC** uses **Demand** forecast methodology to produce forecasts of **NGC Demand**. ~~A written record of the use of the methodology must be kept by **NGC** for a period of at least 12 months~~ A record of the use of mathematical models for the preceding 12 months will be kept by **NGC**.

OC1.6.3 The methodology will be based upon factors (a), (b) and (c) above to produce, by statistical means, unbiased forecasts of **National Demand**. **NGC Demand** will be calculated from these forecasts but will also take into account factors (d), (e), (f), (g), (h), (i) and (j) above. No other factors are taken into account by **NGC**, and it will base its **NGC Demand** forecasts on those factors only.

< End of OC1 >