

**GRID CODE REVIEW PANEL
17th MAY 2001**

CHANGES TO THE DEFINITIONS OF 'NGC DEMAND' AND 'NATIONAL DEMAND'

1. INTRODUCTION

- 1.1 For the long-term planning of the NGC Transmission System, National Grid need to consider all demand which affects the performance of that system. All elements of demand need to be taken into account including exports from the NGC Transmission System across External Interconnections. For this purpose National Grid use, amongst other things, the demand forecasts submitted by Users in accordance with the Grid Code (in particular the Planning Code) and associated Grid Code terminology.
- 1.2 The term **NGC Demand** and the related term **National Demand** are both defined in the Grid Code. However, as currently defined, neither term is wholly appropriate in that they do not include all the elements of demand to be taken into account in long-term planning.
- 1.3 This paper:
- (i) outlines the current Grid Code usage of the above terms;
 - (ii) reviews their definitions commenting on their appropriateness for long-term planning;
 - (iii) proposes revised definitions of **NGC Demand** and **National Demand**; and
 - (iv) proposes related housekeeping changes to PC.A.4.2.3(b) and PC.A.4.3.2(a)

2. CURRENT GRID CODE USAGE

- 2.1 The term **NGC Demand** is used in the PC, OC1, OC2, OC6, BC1 and the DRG. The term **National Demand** is used in OC1 and BC1.

PC - Planning Code

- 2.2 The value of **NGC Demand** is not used but the date and time of the annual peak and annual minimum **NGC Demand** is notified by NGC to enable Users to submit demand forecasts in respect of that time.

OC1 - Demand Forecasts

- 2.3 The date and time (specified under the PC) of the annual peak half hour **NGC Demand** is again used (rather than its value) in relation to information provided by Users on Medium Power Station output and Demand Control in the Operational Planning Phase.
- 2.4 The factors taken into account by NGC when producing forecasts of **NGC Demand** are listed. They include: anticipated interconnection flows across External Interconnections and anticipated Pumped Storage Unit demand.
- 2.5 OC1 also explains that the defined term **National Demand** does not include: anticipated interconnection flows across External Interconnections or anticipated Pumped Storage Unit demand.

OC2 - Operational Planning and Data Provision

- 2.6 Explains how Operational planning involves planning, through various timescales, the matching of generation output (Output Usable) with forecast **NGC Demand**.

OC6 - Demand Control

- 2.7 Includes notification to NGC by the Network Operator of details of frequency settings at which Demand Disconnection will be initiated at the time of the annual peak of the **NGC Demand**; the time having been notified by NGC under the PC.

BC1 - Pre Gate Closure Process

- 2.8 Explains that NGC will make available to Users a forecast **NGC Demand** (by 12.00h) and a forecast **National Demand** (by 9.00h) both in respect of each Settlement Period of the next Operational Day.
- 2.9 Explains that NGC will monitor the Maximum Export Limit component of the Export and Import Limits received against forecast **NGC Demand** and the Operating Margin to establish whether the anticipated System Margin in any period is sufficient.

DRC -Data Registration Code

- 2.10 Presents unified list of all data required by Users from NGC including:
- date and time of annual peak half hour of **NGC Demand** at Annual ACS Conditions; and
 - date and time of annual minimum half hour of **NGC Demand** at Average Conditions

and by NGC from Users including

- Demand at the time of peak **NGC Demand**; and
- Demand at the time of minimum **NGC Demand**

3. CURRENT GRID CODE DEFINITIONS

NGC DEMAND

3.1 The current GC definition is:

- (a) *The amount of electricity to be supplied from the **Grid Supply Points** and to be supplied by **Embedded Large Power Stations** plus **NGC Transmission System Losses** less the output of directly connected **Medium Power Stations** and directly connected **Small Power Stations**; or which may also be expressed as*
- (b) ***Demand on the Total System** less the output of **Medium Power Stations** and **Small Power Stations**.*

3.2 The definition of **NGC Demand** is unclear in certain areas, open to interpretation and as a consequence not considered wholly appropriate for long-term planning. The following observations are relevant:

- (i) There is no mention of imports/exports across External Systems (directly connected or embedded).
- (ii) For directly connected External Systems, electricity exported is not included by definition since the definition refers only to electricity supplied from GSPs. The definition of GSP relates only to points of supply from the NGC Transmission System to Network Operators or Non-Embedded Customers. The definition of Network Operator specifically excludes Externally Interconnected System Operators and the definition of Non-Embedded Customer only includes customers in England and Wales.

In contrast to this, the wording in OC1 (para 2.4 refers) explains that in forecasting **NGC Demand**, NGC take account of anticipated interconnection flows across External Interconnections (OC1.6.1(d) refers).

- (iii) With regard to part (b) of the definition; the Total System is defined as 'the NGC Transmission System and all User Systems in England and Wales'. The question again arises as to whether the demand on the Total System includes or excludes demand arising from exports to External Systems. Long-term planning clearly needs to take such exports (and imports) into account.
- (iv) Part (b) of the definition does not mention Customer Generating Plant, the output of which is also deducted (as considered appropriate by the User) from the demand forecast provided to NGC (PC.A.4.2.3(b) and PC.A.4.3.2(a) again refer).

However, the definition of Customer Generating Plant is such that the demand supplied by such plant does not fall on the Total

System. Nevertheless use of the term 'Total System' within the definition presents an (apparent rather than real) inconsistency and does not aid clarity.

NATIONAL DEMAND

3.3 The current GC definition is:

Demand on the Total System less:

- (a) *the output of **Medium Power Stations** and **Small Power Stations**; and*
- (b) *the **Demand** being taken by **Station Transformers** and **Pumped Storage Units**; and*
- (c) *exports from the **NGC Transmission System** across **External Interconnections**.*

3.4 This definition is directly related to the GC definition of **NGC Demand** through use of the term 'Demand on the Total System'. However there is an apparent inconsistency between part (c) of the definition of **National Demand** and part (b) of the definition of **NGC Demand**.

3.5 The definitions imply the difference between the two is Demand taken by Station Transformers, Pumped Storage Units and exports across External Interconnections. However, as previously explained, exports across External Interconnections cannot be included in **NGC Demand** by definition and cannot therefore be a component of the difference (para 3.2(ii) refers).

4. PROPOSED REVISED DEFINITION OF 'NGC DEMAND'

4.1 In long term planning all generation and demand affecting the performance (e.g. power flows) of the NGC Transmission System must be considered.

4.2 The following revised definition of **NGC Demand** is offered for consideration:

*The amount of electricity supplied from the **Grid Supply Points** plus:-*

- *that supplied by **Embedded Large Power Stations**, and*
- *exports from the **NGC Transmission System** across **External Interconnections** and*
- ***NGC Transmission Losses**,*

and, for the purposes of this definition, includes:-

- *the **Demand** taken by **Station Transformers** and **Pumped Storage Units**.*

4.3 This wording assumes that PC.A.4.2.3(b) and PC.A.4.3.2(a) are modified such that the Network Operator also takes account of imports/exports across External Interconnections which are connected to the User System.

4.4 The above definition is explicit with regard to External Interconnections and avoids the problematic use of the term 'Demand on the Total System'

5. PROPOSED REVISED DEFINITION OF 'NATIONAL DEMAND'

5.1 Although not used in long term planning, it is proposed that the opportunity is also taken to revise the definition of **National Demand** for clarity and for consistency with the proposed new definition of **NGC Demand**.

5.2 The following revised definition of **National Demand** is offered for consideration:

*The amount of electricity supplied from the **Grid Supply Points** plus:-*

- *that supplied by **Embedded Large Power Stations**, and*
- ***NGC Transmission Losses**,*

minus:-

- *the **Demand** taken by **Station Transformers** and **Pumped Storage Units**, and*
- *any exports from the **NGC Transmission System** across **External Interconnections**.*

5.3 The above definition directly relates to the proposed definition of **NGC Demand** and the difference between the two is readily discernible.

6. PROPOSED REVISION PC.A.4.2.3(b) AND PC.A.4.3.2(a)

- 6.1 For embedded connections to External Systems (e.g. Norweb/Isle of Man), there is no mention in the GC as to how imports/exports should be treated by the host Network Operator when providing NGC with demand forecasts (e.g. PC.A.4.2.3(b) and PC.A.4.3.2(a)).
- 6.2 It may be reasonable to expect that, in the event, the Network Operators will make due allowance for such exports/imports in submitting their demand forecast to NGC. However, for the avoidance of doubt, this should be explicitly stated in the same way as their allowance for demand met by embedded Medium and Small Power Stations and Customers Generating Plant.
- 6.3 To this end, it is proposed that these paragraphs are reworded to include deductions reasonably considered appropriate by the User to take account of demand supplied by External Systems across Embedded External Interconnections. The proposed revised paragraphs, with changes highlighted, are:

PC.A.4.2.3(b)

in the case of PC.A 4.2.1(a), (b) and (c), be that remaining after any deductions reasonably considered appropriate by the **User** to take account of the output profile of all **Embedded Small Power Stations** and **Embedded Medium Power Stations** and **Customer Generating Plant** and imports across **Embedded External Interconnections**;

PC.A.4.3.2(a)

be that remaining after any deductions reasonably considered appropriate by the **User** to take account of the output of all **Embedded Small Power Stations** and **Embedded Medium Power Stations** and **Customer Generating Plant** and imports across **Embedded External Interconnections** and such deductions should be separately stated;

7. NEXT STEPS

- 7.1 Members of the Grid Code Review Panel are invited to discuss and agree the proposals laid out in this paper (paras 4.2, 5.2 and 6.3 refer).
- 7.2 Subject to any comments received from Panel Members at the GCRP meeting on 17th May 2001, NGC would intend to issue a consultation paper shortly after that date.