NATIONAL GRID COMPANY PLC

GRID CODE REVIEW PANEL

REVIEW OF GRID CODE OPERATING CODE OC2

INTRODUCTION

1. This paper is concerned with a review of Grid Code OC2 (Operational Planning and Data Provision) which NGC has been undertaking.

2. OC2 is concerned with the co-ordination of generator, transmission and distribution system outages to minimise restriction of generation and the provision of information to generators of predicted generation surpluses over demand and the maintenance of reserve margins.

3. To minimise restrictions on generation, meet security standards and ensure economic system operation, National Grid generally arranges works on the transmission system to fit in with outage plans submitted by generators rather than discussing and agreeing when generators can take outages.

4. With regard to generation surplus and margin information, the generators again provided availability data to National Grid. This is processed against demand estimates and provided back to the market and transmission system users where required. National Grid also provides detailed transmission system outage information to users. The information provided is tailored to the recipient's operational requirements.

REVIEW OF OC2

5. The review has identified areas of Grid Code OC2 that would benefit from change and/or updating. The need for change falls in to two distinct categories:

   (a) Those changes that National Grid believes could be implemented in the short term to clarify the existing provisions and more fully reflect current practice.

   (b) Those changes that would require more in depth consideration and may result in a change to current practice.

   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 Short Term Changes

6. The proposed changes falling under (a) above are indicated in the change marked version of OC2 attached as an appendix to this paper. Briefly the proposed changes are as follows:

   Generator Outage Planning

   - OC2 .1.3 Clarification that timescales relate to calendar years for generator outage planning and financial years for transmission outage planning.

- OC2.4.1.2 Clarification on when generator outage and Output Usable data is required on a weekly or daily resolution.

- OC2.4.1.2.1(b)(i) Clarification of Interconnector import capacity.

- Clarification that NGC will provide data and updates to Network Operators if in NGC's reasonable opinion the integrity of the Network Operator's User System is affected, e.g. OC2.4.1.2.1(c)(ii).

- OC2.4.1.2.2 Replacement of obsolete term (Despatch Units) with Gensets.

- OC2.4.1.2.3 (c) To enable NGC to fulfil it's obligations under section Q6.5 of the BSC data is provided related to the 2nd week ahead rather than the 8th week ahead up to the 52nd week ahead.

- Deletion of now unnecessary text associated with the meaning of 'in writing' e.g. OC2.4.1.2.4 (b)

- Inclusion of text to clarify timescales.

- Other text changes to improve ease of reading.

Transmission Outage Planning

- OC2.4.1.3 Operational Planning Phase – NGC carries out planning for years 2 to 5 ahead and year 1 ahead.

- OC2.4.1.3.2 (e) For years 2 to 5 ahead NGC would not have information on proposed start and end dates for relevant Transmission outages.

- OC2.4.1.3.3 (e) Redrafting to clarify the existing text which is not clear on what is meant by 'impact' and 'restrictions'.

- OC2.4.1.3.3 (h)(iii) Clarification that outage plan and updates will be provided 'in writing' rather than by post. This would enable electronic data transfer.

- Other text changes to improve ease of reading.

Medium/Longer Term Changes

7. As indicated above the review of OC2 has identified areas that might benefit from more in-depth consideration. Some examples (non exhaustive) of such areas are as follows:

    - Inclusion of allowance for plant breakdown in Output Useable.

    - Provisions for data exchange.

    - Treatment of Interconnectors in OC2.

    - Updating of NRAPM and Frequency Response sections to reflect operation under NETA.

Timescales

8. In order to progress the proposed short term changes to meet the BETTA timescales referred to above, National Grid proposes that following discussion with GCRP members and any necessary further discussion after the Panel Meeting by e-mail or other means, a wider consultation on the proposed changes is carried out in early June 2003.

Way Forward

9. GCRP members are invited:

- To consider the proposed short term changes described in this paper;
- To agree the proposed approach for implementing short term changes to OC2 to meet BETTA timescales;
- To raise any points at the Grid Code Review Panel Meeting;
- To note that any medium or longer term issues relating to the development of OC2 will be brought forward for consideration once the GB Grid Code has been developed.

National Grid Company plc.
8th May 2003

OPERATING CODE NO.2

Based on Revision 8

OPERATIONAL PLANNING AND DATA PROVISION

OC2.1 INTRODUCTION

OC2.1.1 **Operating Code No. 2** ("**OC2**") is concerned with:

(a) the co-ordination of the release of **Gensets**, the **NGC Transmission System** and **Network Operators' Systems** for construction, repair and maintenance;

(b) provision by **NGC** of the **Surpluses** both for the **NGC Transmission System** and **System Zones**;

(c) the provision by **Generators** of **Generation Planning Parameters** for **Gensets**, including **CCGT Module Planning Matrices**, to **NGC** for planning purposes only; and

(d) the agreement for release of **Existing Gas Cooled Reactor Plant** for outages in certain circumstances.

OC2.1.2 (a) **Operational Planning** involves planning, through various timescales, the matching of generation output with forecast **NGC Demand** together with a reserve of generation to provide a margin, taking into account outages of certain **Generating Units**, and of parts of the **NGC Transmission System** and of parts of **Network Operators' Systems** which is carried out to achieve, so far as possible, the standards of security set out in the **Transmission Licence** or **Electricity Distribution Licence** as the case may be.

(b) In general terms there is an "envelope of opportunity" for the release of **Gensets** and for the release of parts of the **NGC Transmission System** and parts of the **Network Operator's User Systems** for outages. The envelope is defined by the difference between the total generation output expected from **Large Power Stations**, **Medium Power Stations** and **Demand**, the operational planning margin and taking into account **External Interconnections**.

OC2.1.3 In this **OC2** for the purpose of **Generator** outage co-ordination Year 0 means the current calendar year at any time, Year 1 means the next calendar year at any time, Year 2 means the calendar year after Year 1, etc. For the purpose of **Transmission** outage planning 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.

OC2.1.4 References in **OC2** to a **Generator's** "best estimate" shall be that **Generator's** best estimate acting as a reasonable and prudent **Generator** in all the circumstances, and references to neutral data is to data which has a 50% probability of being exceeded.

OC2.1.5 References to **NGC** planning its **Transmission System** outage programme on the basis of the **Final Generation Outage Programme**, are to **NGC** planning against the **Final Generation Outage Programme** current at the time it so plans.

OC2.1.6 Where in OC2 data is required to be submitted or information is to be given on a particular day, that data does not need to be submitted and that information does not need to be given on that day if it is not a **Business Day** or it falls within a holiday period (the occurrence and length of which shall be determined by **NGC**, in its reasonable discretion, and notified to **Users).** Instead, that data shall be submitted

and/or that information shall be given on such other **Business Day** as **NGC** shall, in its reasonable discretion, determine. However, **NGC** may determine that that data and/or information need not be submitted or given at all, in which case it shall notify each **User** as appropriate.

OC2.1.7 Where in this **OC2** a **Generator** is required to submit an **Output Usable** forecast of its **Large Power Stations** or of each of its **Gensets**, in the case of **Embedded Large Power Stations** and **Embedded Gensets**, the **Output Usable** forecast must be adjusted by the **User** prior to submission to represent MW at the relevant **Grid Supply Point**.

OC2.2 OBJECTIVE

OC2.2.1 (a) The objective of **OC2** is to seek to enable **NGC** to harmonise outages of **Gensets** in order that such outages are co-ordinated (taking account of **Medium Power Stations**) between **Generators** and **Network Operators**, and that such outages are co-ordinated taking into account **NGC Transmission System** outages and other **System** outages, so far as possible to minimise the number and effect of constraints on the **NGC Transmission System** or any other **System**.

(b) In the case of **Network Operator' User Systems** directly connected to the **NGC Transmission System** this means in particular that there will also need to be harmonisation of outages of **Embedded Gensets,** and **NGC Transmission System** outages, with **Network Operators** in respect of their outages on those **Systems**.

OC2.2.2 The objective of **OC2** is also to enable the provision by **NGC** of the **Surpluses** both for the **NGC Transmission System** and **System Zones**.

OC2.2.3 A further objective of **OC2** is to provide for the agreement for outages for **Existing Gas Cooled Reactor Plant** in certain circumstances and to enable a process to be followed in order to provide for that.

OC2.2.4 The boundaries of the **System Zones** will be determined by **NGC** from time to time taking into account the disposition of **Generators' Power Stations** within the **System Zones.** The location of the boundaries will be made available to all **Users**. Any **User** may request that **NGC** reviews any of the **System Zonal** boundaries if that **User** considers that the current boundaries are not appropriate, giving the reasons for their concerns. On receipt of such a request **NGC** will review the boundaries if, in **NGC's** reasonable opinion, such a review is justified.

OC2.3 SCOPE

OC2.3.1 **OC2** applies to **NGC** and to **Users** which in **OC2** means:-

(a) **Generators**, other than those which only have **Embedded Small Power Stations** or **Embedded Medium Power Stations**, (and the term **Generator** in this **OC2** shall be construed accordingly);

(b) **Network Operators**; and

(c) **Non-Embedded Customers**.

OC2.4 PROCEDURE

OC2.4.1 Co-ordination of Outages

OC2.4.1.1 Under **OC2** the interaction between **NGC** and **Users** will be as follows:

(a)	Each **Generator** and **NGC**	In respect of outages of **Large Power Stations** (both **Embedded** and non-**Embedded**) and in respect of outages of other **Plant** and/or **Apparatus** directly connected to the **NGC Transmission System**;
(b)	**NGC** and each **Generator**	in respect of **NGC Transmission System** outages relevant to each **Generator** (other than in respect of **Embedded Small Power Stations** or **Embedded Medium Power Stations**);
(c)	**NGC** and each **Network Operator**	in respect of outages of all **Embedded Large Power Stations** and in respect of outages of other **Plant** and/or **Apparatus** relating to such **Embedded Large Power Stations**;
(d)	**NGC** and each **Network Operator** and each **Non-Embedded Customer**	in respect of **NGC Transmission System** outages relevant to the particular **Network Operator** or **Non-Embedded Customers**;
(e)	Each **Network Operator** and each **Non-Embedded Customer** and **NGC**	in respect of **User System** outages relevant to **NGC**.

OC2.4.1.2 PLANNING OF **GENSET** OUTAGES

OC2.4.1.2.1 **Operational Planning Phase** - Planning for Years 3 to 5 inclusive – Weekly Resolution

In each calendar year:

(a) By the end of week 2

Each **Generator** will provide **NGC** in writing with:

(i) a provisional **Genset** outage programme (covering both **Embedded** and non-**Embedded Large Power Stations**) for Year 3 to Year 5 (inclusive) specifying the **Genset** and MW concerned, duration of proposed outages, the preferred date for each outage and where there is a possibility of flexibility, the earliest start date and latest finishing date; and

(ii) a best estimate neutral weekly **Output Usable** forecast of all its **Gensets** for Year 3 to Year 5.

(b) Between the end of week 2 and the end of week 12

NGC will be:

(i) calculating total winter peak generating capacity assumed to be available to the **Total System** (taking into account the import capacity which may be available from **External Interconnections**);

(ii) calculating the total winter peak generating capacity expected from **Large Power Stations**, taking into account **Demand** forecasts and details of proposed use of **Demand Control** received under **OC1**, and an operational planning margin set by **NGC** (the "**Operational Planning Margin**");

(iii) calculating the weekly peak generating capacity expected from **Large Power Stations** taking into account demand forecasts and details of proposed use of **Demand Control** received under **OC1**, and the **Operational Planning Margin** and **Zonal System Security Requirements.** The total weekly peak MW needed to be available is the "weekly total MW required".

The calculation under (iii) will effectively define the envelope of opportunity for outages of **Gensets**.

During this period, **NGC** may, as appropriate, contact each **Generator** who has supplied information to seek clarification on points.

(c) By the end of week 12

NGC will:

(i) having taken into account the information notified to it by **Generators** and taking into account:-

(1) **NGC Transmission System** constraints and outages,

(2) **Network Operator System** constraints and outages, known to **NGC**, and

(3) the **Output Usable** required, in its view, to meet weekly total MW requirements,

provide each **Generator** in writing with any suggested amendments to the provisional outage programme supplied by the **Generator** which **NGC** believes necessary, and will advise **Generators** with **Large Power Stations** of the **Surpluses** both for the **NGC Transmission System** and **System Zones** and potential export limitations, on a weekly basis, which would occur without such amendments;

(ii) provide each **Network Operator** in writing with potential outages of **Gensets** ~~which are either in that **Network Operator's User System** or~~ which may, in the reasonable opinion of **NGC**, affect the integrity of that **Network Operator's User System** provided that, in such circumstances **NGC** has notified the **Generator** concerned at least 48 hours beforehand of its intention to do so (including identifying the **Genset** concerned).

(d) By the end of week 14

(i) Where a **Generator** or a **Network Operator** is unhappy with the suggested amendments to its provisional outage programme (in the case of a **Generator**) or such potential outages (in the case of a **Network Operator**) it may contact **NGC** to explain its concerns and **NGC** and that **Generator** or **Network Operator** will then discuss the problem and seek to resolve it.

(ii) The possible resolution of the problem may require **NGC** or a **User** to contact other **Generators** and **Network Operators**, and joint meetings of all parties may, if any **User** feels it would be helpful, be convened by **NGC**. The need for further discussions, be they on the telephone or at meetings, can only be determined at the time.

(e) By the end of week 25

Each **Generator** will provide **NGC** in writing with an updated provisional **Genset** outage programme covering both **Embedded** and non-**Embedded Large Power Stations** together with the best estimate neutral weekly **Output Usable** forecasts (with a description of its statistical basis) for each **Genset**, in all cases for Year 3 to Year 5 (inclusive). The updated provisional **Genset** outage programme will contain the MW concerned, duration of proposed outages, the preferred date for each outage and, where applicable, earliest start date and latest finishing date, together with an update of the **Output Usable** estimate supplied under (a)(ii) above.

(f) Between the end of week 25 and the end of week 28

NGC will be considering the updated provisional **Genset** outage programme, together with the best estimate neutral weekly **Output Usable** forecasts supplied to it by **Generators** under (e) and their **Registered Capacity** and will be analysing **Operational Planning Margins** for the period.

(g) By the end of week 28

NGC will:

(i) provide each **Generator** in writing with details of any suggested revisions considered by **NGC** as being necessary to the updated provisional **Genset** outage programme supplied to **NGC** under (e) and will advise **Generators** with **Large Power Stations** of the **Surpluses** for the **NGC Transmission System** and **System Zones** and potential export limitations on a weekly basis which would occur without such revisions; and

(ii) provide each **Network Operator** in writing with the update of potential outages of **Gensets** which, in the reasonable opinion of **NGC**, affect the integrity of ~~in its~~ that **Network Operators** **User System**.

(h) By the end of week 31

Where a **Generator** or a **Network Operator** is unhappy with the revisions suggested to the updated provisional **Genset** outage programme (in the case of a **Generator**) or such update of potential outages (in the case of a **Network Operator**) under (g) it may contact **NGC** to explain its concerns and the provisions set out in (d) above will apply to that process.

(i) By the end of week 42

NGC will:

(1) provide each **Generator** in writing with details of suggested revisions considered by **NGC** as being necessary to the updated provisional **Genset** outage programme supplied to **NGC** and will advise **Generators** with **Large Power Stations** of the **Surpluses** for the **NGC Transmission System** and **System Zones** and potential export limitations, on a weekly basis which would occur without such revisions;

(2) provide each **Network Operator** in writing with the update of potential outages of **Gensets** ~~which are either in that **Network Operator's User System** or~~ which may, in the reasonable opinion of **NGC**, affect the integrity of that **Network Operator's User System** provided that, in such circumstances **NGC** has notified the **Generator** concerned at least 48 hours beforehand of its intention to do so (including identifying the **Gensets** concerned).

(j) By the end of week 45

NGC will seek to agree a **Final Generation Outage Programme** for Year 3 to Year 5. If agreement cannot be reached on all aspects, **NGC** and each **Generator** will record their agreement on as many aspects as have been agreed and **NGC** will advise each **Generator** with **Large Power Stations** and each **Network Operator**, of the **Surpluses** for the **NGC Transmission System** and **System Zones** on a weekly basis which would occur in relation to those aspects not agreed. It is accepted that agreement of the **Final Generation Outage Programme** is not a commitment on **Generators** or **NGC** to abide by it, but **NGC** will be planning its **NGC Transmission System** outage programme on the basis of the **Final Generation Outage Programme** and if in the event the **Generator's** outages differ from those contained in the **Final Generation Outage Programme**, or in any way conflict with the **NGC Transmission System** outage programme, **NGC** need not alter its **NGC Transmission System** outage programme.

OC2.4.1.2.2 **Operational Planning Phase** - Planning for Year 1 and Year 2 – Weekly Resolution

The basis for **Operational Planning** for Year 1 and Year 2 will be the **Final Generation Outage Programmes** agreed for Years 2 and 3:

In each calendar year:

(a) By the end of week 10

Each **Generator** will provide **NGC** in writing with its previously agreed **Final Generation Outage Programme** updated and best estimate neutral weekly **Output Usable** forecasts for each **Genset** for weeks 1-52 of Years 1 and 2.

(b) Between the end of week 10 and the end of week 12

NGC will be considering the updated proposed **Genset** outage programme together with the estimate of **Output Usable** supplied by **Generators** under (a) and will be analysing **Operational Planning Margins** for the period. Taking these into account together with **NGC Transmission System** constraints and

outages and **Network Operator User System** constraints and outages known to **NGC**, **NGC** will assess whether the estimates of **Output Usable** supplied by **Generators** are sufficient to meet forecast **NGC Demand** plus the **Operational Planning Margin**.

(c) By the end of week 12

NGC will:

(i) notify each **Generator** in writing whether the **Output Usable** estimates are adequate for weeks 1-52 of Years 1 and 2, ~~weeks 1-52,~~ together with suggested changes to its **Final Generation Outage Programme** where necessary and will advise each **Generator** with **Large Power Stations** of the **Surpluses** both for the **NGC Transmission System** and **System Zones** and potential export limitations, on a weekly ~~basis~~ resolution which would occur without such changes;

(ii) provide each **Network Operator** in writing with weekly **Output Usable** estimates of **Generators** for weeks 1- 52 of Years 1 and 2, ~~weeks 1- 52~~ and with updated details of potential outages, in each case relating to **Gensets** ~~which are either in that **Network Operator's User System** or~~ which may, in the reasonable opinion of **NGC**, affect the integrity of that **Network Operator's User System** provided that, in such circumstances, **NGC** has notified the **Generator** concerned at least 48 hours beforehand of its intention to do so (including identifying the **Gensets** concerned).

(d) By the end of week 14

Where a **Generator** or a **Network Operator** is unhappy with any suggested changes to its **Final Generation Outage Programme** (in the case of a **Generator**) or such update of potential outages (in the case of a **Network Operator**), equivalent provisions to those set out in OC2.4.1.2.1(d) will apply.

(e) By the end of week 34

Each **Generator** will provide **NGC** in writing with revised best estimate neutral weekly **Output Usable** forecasts for each **Genset** for weeks 1-52 of Years 1 and 2.

(f) Between the end of week 34 and the end of week 39

NGC will be analysing the revised estimates of **Output Usable** supplied by **Generators** under (e) and will be analysing **Operational Planning Margins** for the period. Taking these into account together with **NGC Transmission System** constraints and outages and **Network Operator User System** constraints and outages known to **NGC**, **NGC** will assess whether the estimates of **Output Usable** supplied by **Generators** are sufficient to meet forecast **NGC Demand** plus the **Operational Planning Margin**.

(g) By the end of week 39

NGC will:

(i) notify each **Generator** in writing whether it accepts the **Output Usable** estimates for weeks 1-52 of Years 1 and 2, ~~weeks 1-52~~ and of any suggested changes to its **Final Generation Outage Programme** where

necessary and will advise **Generators** with **Large Power Stations** of the **Surpluses** both for the **NGC Transmission System** and **System Zones** and potential export limitations on a weekly basis which would occur without such changes;

(ii) provide each **Network Operator** in writing with **Output Usable** estimates of **Generators** for weeks 1-52 of Years 1 and 2, ~~weeks 1-52~~ and updated details of potential outages, in each case relating to **Gensets** ~~which are either in that **Network Operator's User System** or~~ which may, in the reasonable opinion of **NGC**, affect the integrity of that **Network Operator's User System** provided that, in such circumstances, **NGC** has notified the **Generator** concerned at least 48 hours beforehand of its intention to do so (including identifying the ~~**Despatch Units**~~ **Gensets** concerned).

(h) By the end of week 46

Where a **Generator** or a **Network Operator**, is unhappy with any suggested changes to its **Final Generation Outage Programme** (in the case of a **Generator**) or such update of potential outages (in the case of a **Network Operator**), equivalent provisions to those set out in OC2.4.1.2.1(d) will apply.

(i) By the end of week 48

NGC will seek to agree the revised **Final Generation Outage Programme** for Year 1 and Year 2. If agreement cannot be reached on all aspects, **NGC** and each **Generator** will record their agreement on as many aspects as have been agreed and **NGC** will advise each **Generator** with **Large Power Stations** and each **Network Operator**, of **Generating Plant Demand Margins** for national and zonal groups, on a weekly basis, which would occur in relation to those aspects not agreed. It is accepted that agreement of the **Final Generation Outage Programme** is not a commitment on **Generators** or **NGC** to abide by it, but **NGC** will be planning its **NGC Transmission System** outage programme on the basis of the **Final Generation Outage Programme** and if, in the event, a **Generator's** outages differ from those contained in the **Final Generation Outage Programme**, or in any way conflict with the **NGC Transmission System** outage programme, **NGC** need not alter the **NGC Transmission System** outage programme.

OC2.4.1.2.3 ~~**Operational Planning Phase** –~~ Planning for Year 0 – Weekly Resolution

The basis for **Operational Planning** for Year 0 will be the revised **Final Generation Outage Programme** agreed for Year 1:

In each week:

(a) By 1600 hours each Wednesday - Weekly Resolution

Each **Generator** will provide **NGC** in writing with an update of the **Final Generation Outage Programme** and a best estimate weekly **Output Usable** forecast (without allowance being made for **Generating Unit** breakdown) for each of its **Gensets** from the 2nd week ahead to the 7th week ahead and a best estimate neutral weekly **Output Usable** forecast (with allowance being made for **Generating Unit** breakdown) for each of its **Gensets** from the 8th week ahead to the 52nd week ahead.

(b) Between 1600 hours Wednesday and ~~1700~~ 1600 hours Friday

NGC will be analysing the revised estimates of **Output Usable** supplied by **Generators** under (a) and will be analysing **Operational Planning Margins** for the period. Taking into account **NGC Transmission System** constraints and outages and **Network Operator User System** constraints and outages known to **NGC**, **NGC** will assess whether the estimates of **Output Usable** supplied by **Generators** are sufficient to meet forecast **NGC Demand** plus the **Operational Planning Margin**.

(c) ~~On Friday (by 1700 hours)~~ By 1600 hours each Friday

NGC will:

(i) notify each **Generator** with **Large Power Stations** and **Network Operator**, in writing if it considers the **Output Usable** forecasts will give **Surpluses** and potential export limitations both for the **NGC Transmission System** and **System Zones** from the ~~8th~~ 2nd week ahead to the 52nd week ahead;

(ii) provide each **Network Operator**, in writing with weekly **Output Usable** estimates from the ~~8th~~ 2nd week ahead to the 52nd week ahead and updated outages, each relating to **Gensets** ~~which are either in its **User System** or~~ which may, in the reasonable opinion of **NGC**, affect the integrity of that **Network Operator's User System** and in such circumstances, **NGC** shall notify the **Generator** concerned within 48 hours of so providing (including identifying the **Gensets** concerned), from the ~~8th~~ 2nd week ahead to the 52nd week ahead.

OC2.4.1.2.4 Programming Phase - 2-49 Days Ahead – Daily Resolution

(a) By 1200 hours each Friday

NGC will notify in writing each **Generator** with **Large Power Stations** and **Network Operator** if it considers the **Output Usable** forecasts will give MW shortfalls both nationally and for constrained groups for the period 2-7 weeks ahead.

(b) By 1100 hours each **Business Day**

Each **Generator** shall provide **NGC** in writing ~~(or by such electronic data transmission facilities as have been agreed with **NGC**)~~ with the best estimate of daily **Output Usable** for each **Genset** for the period from and including day 2 ahead to day 14 ahead, including the forecast return to service date for any such **Generating Unit** subject to **Planned Outage** or breakdown. For the period 2 to 7 weeks ahead, each **Generator** shall provide **NGC** in writing with changes (start and finish dates) to **Planned Outage** or to the return to service times of each **Genset** which is subject to breakdown.

(c) Between 1100 hours and 1600 hours each **Business Day**

NGC will be analysing the revised estimates of **Output Usable** supplied by **Generators** under (b) and will be analysing **Operational Planning Margins** for the period 2-14 days ahead. Taking into account **NGC Transmission System** constraints and outages and **Network Operator User System** constraints and

outages known to **NGC**, **NGC** will assess whether the estimates of **Output Usable** are sufficient to meet forecast **NGC Demand** plus the **Operational Planning Margin**.

(d) By 1600 hours each **Business Day**

(i) **NGC** will notify in writing ~~(or by such electronic data transmission facilities as have been agreed with **NGC**)~~ each **Generator** with **Large Power Stations** and each **Network Operator**, of the **Surpluses** both for the **NGC Transmission System** and **System Zones** and potential export limitations, for the period from and including day 2 ahead to day 14 ahead which it considers the **Output Usable** forecasts will give. The time of 1600 hours can only be met in respect of any **Generator** or **Network Operator** if all the information from all **Generators** was made available to **NGC** by 1100 hours and if a suitable electronic data transmission facility is in place between **NGC** and the **Generator** or the **Network Operator**, as the case may be, and if it is fully operational. In the event that any of these conditions is not met, or if it is necessary to revert to a manual system for analysing the information supplied and otherwise to be considered, **NGC** reserve the right to extend the timescale for issue of the information required under this sub-paragraph to each, or the relevant, **Generator** and/or **Network Operator** (as the case may be) provided that such information will in any event be issued by 1800 hours.

(ii) NGC will provide each **Network Operator**, where it has an effect on that **User**, in writing with **Output Usable** estimates from and including day 2 ahead to day 14 ahead and updated outages, each relating to **Gensets** which are either in its **User System** or which may, in the reasonable opinion of **NGC**, affect the integrity of that **Network Operator's User System** and in such circumstances, **NGC** shall notify the **Generator** concerned within 48 hours of so providing (including identifying the **Gensets** concerned), for the period from and including day 2 ahead to day 14 ahead.

OC2.4.1.3 Planning of **NGC Transmission System** Outages

OC2.4.1.3.1 **Operational Planning Phase** - Planning for Years ~~3~~ 2 to 5 inclusive ahead

NGC shall plan **NGC Transmission System** outages required in Years ~~3~~ 2 to 5 inclusive required as a result of construction or refurbishment works. This contrasts with the planning of **NGC Transmission System** outages required in Years 0~~,~~ and 1 ~~and 2~~ ahead, when **NGC** also takes into account **NGC Transmission System** outages required as a result of maintenance.

Users should bear in mind that **NGC** will be planning its **NGC Transmission System** outage programme on the basis of the previous year's **Final Generation Outage Programme** and if in the event a **Generator's** or **Network Operator's** outages differ from those contained in the **Final Generation Outage Programme**, or in the case of **Network Operators**, those known to **NGC**, or in any way conflict with the **NGC Transmission System** outage programme, **NGC** need not alter its **NGC Transmission System** outage programme.

OC2.4.1.3.2 In each calendar year:

(a) By the end of week 8

Each **Network Operator** will notify **NGC** in writing of details of proposed outages in Years ~~3~~ 2-5 ahead in its **User System** which may affect the performance of

the **Total System** (which includes but is not limited to outages of **User System Apparatus** at **Grid Supply Points** and outages which constrain the output of **Gensets Embedded** within that **User System**).

(b) By the end of week 13

Each **Generator** will inform **NGC** in writing of proposed outages in Years ~~3~~ 2 - 5 ahead of **Generator** owned **Apparatus** (eg. busbar selectors) other than **Gensets,** at each **Grid Entry Point**.

NGC will provide to each **Network Operator** and to each **Generator** a copy of the information given to **NGC** under paragraph (a) above (other than the information given by that **Network Operator**). In relation to a **Network Operator**, the data must only be used by that **User** in operating that **Network Operator's User System** and must not be used for any other purpose or passed on to, or used by, any other business of that **User** or to, or by, any person within any other such business or elsewhere.

(c) By the end of week 28

NGC will provide each **Network Operator** in writing with details of proposed outages in Years ~~3~~2-5 ahead which may, in **NGC's** reasonable judgement, affect the performance of ~~its~~ that **Network Operator's** **User System**.

(d) By the end of week 30

Where **NGC** or a **Network Operator** is unhappy with the proposed outages notified to it under (a), (b) or (c) above, as the case may be, equivalent provisions to those set out in OC2.4.1.2.1 (d) will apply.

(e) By the end of week 34

NGC will draw up a draft **NGC Transmission System** outage plan covering the period Years ~~3~~ 2 to 5 ahead and **NGC** will notify each **Generator** and **Network Operator** in writing of those aspects of the plan which may operationally affect such **Generator** (other than those aspects which may operationally affect **Embedded Small Power Stations** or **Embedded Medium Power Stations**) or **Network Operator** ~~including in particular proposed start dates and end dates of relevant **NGC Transmission System** outages~~. **NGC** will also indicate where a need may exist to issue other operational instructions or notifications or **Emergency Instructions** to **Users** in accordance with **BC2** to allow the security of the **NGC Transmission System** to be maintained within the **Licence Standards**.

OC2.4.1.3.3 **Operational Planning Phase** - Planning for Year~~s~~ ~~1~~ 1 ~~and 2~~ ahead

Each calendar year **NGC** shall update the draft **NGC Transmission System** outage plan prepared under OC2.4.1.3.2 above and shall in addition take into account outages required as a result of maintenance work.

In each calendar year:

(a) By the end of week 13

Generators and **Non-Embedded Customers** will inform **NGC** in writing of proposed outages for Year~~s~~ 1 ~~and 2~~ of **Generator** owned **Apparatus** at each

Grid Entry Point (e.g. busbar selectors) other than **Gensets** or **Non-Embedded Customer** owned **Apparatus**, as the case may be, at each **Grid Supply Point**

(b) By the end of week 28

NGC will provide each **Network Operator** and each **Non-Embedded Customer** in writing with details of proposed outages in ~~years~~ Year 1~~-2~~ ahead which may, in **NGC's** reasonable judgement, affect the performance of its **User System** or the **Non-Embedded Customer Apparatus** at the **Grid Supply Point**.

(c) By the end of week 32

Each **Network Operator** will notify **NGC** in writing with details of proposed outages in Year~~s~~ 1 ~~and 2~~ in its **User System** which may affect the performance of the **Total System** (which includes but is not limited to outages of **User System Apparatus** at **Grid Supply Points** and outages which constrain the output of **Gensets Embedded** within that **User System**).

(d) Between the end of week 32 and the end of week 34

NGC will draw up a revised draft **NGC Transmission System** outage plan (which for the avoidance of doubt includes **NGC** owned **Apparatus** at the **Connection Points**).

(e) By the end of week 34

~~**NGC** will inform:~~

~~(i) each **Network Operator** of the impact on its **User System** in Year 1, and~~;

~~(ii) each **Generator** of any potential restrictions on its **Large Power Stations** in Years 1~~

NGC will notify each **Generator** and **Network Operator**, in writing of those aspects of the **NGC Transmission System** outage programme which may, in **NGC's** reasonable opinion, operationally affect that **Generator** (other than those aspects which may operationally affect **Embedded Small Power Stations** or **Embedded Medium Power Stations**) or **Network Operator** including in particular proposed start dates and end dates of relevant **NGC Transmission System** outages.

NGC will provide to each **Network Operator** and to each **Generator** a copy of the information given to **NGC** under paragraph (c) above (other than the information given by that **Network Operator**).
In relation to a **Network Operator**, the data must only be used by that **User** in operating that **Network Operator's User System** and must not be used for any other purpose or passed on to, or used by, any other business of that **User** or to, or by, any person within any other such business or elsewhere.

(f) By the end of week 36

Where a **Generator** or **Network Operator** is unhappy with the proposed ~~restrictions or impacts~~ aspects notified to it under (e) above, equivalent provisions to those set out in OC2.4.1.2.1 (d) will apply.

(g) Between the end of week 34 and 49

NGC will draw up a final **NGC Transmission System** outage plan covering Years ~~and 2~~.

(h) By the end of week 49

(i) **NGC** will complete the final **NGC Transmission System** outage plan for Years ~~and~~ 1 ~~and 2~~. The plan for Year 1 becomes the final plan for Year ~~0~~ 0 when by expiry of time Year ~~1~~ 1 becomes Year 0.

(ii) **NGC** will notify each **Generator** and each **Network Operator** in writing of those aspects of the plan which may operationally affect such **Generator** (other than those aspects which may operationally affect **Embedded Small Power Stations** or **Embedded Medium Power Stations**) or **Network Operator** including in particular proposed start dates and end dates of relevant **NGC Transmission System** outages. **NGC** will also indicate where a need may exist to issue other operational instructions or notifications or **Emergency Instructions** to **Users** in accordance with **BC2** to allow the security of the **NGC Transmission System** to be maintained within the **Licence Standards**. **NGC** will also inform each relevant **Non-Embedded Customer** of the aspects of the plan which may affect it.

(iii) In addition, in relation to the final **NGC Transmission System** outage plan for Year 1, **NGC** will provide to each **Generator** a copy of the final **NGC Transmission System** outage plan for that year. OC2.4.1.3.4 contains provisions whereby updates of the final **NGC Transmission System** outage plan are provided. The plan and the updates will be provided ~~by post~~ in writing. It should be noted that the final **NGC Transmission System** outage plan for Year 1 and the updates will not give a complete understanding of how the **NGC Transmission System** will operate in real time, where the **NGC Transmission System** operation may be affected by other factors which may not be known at the time of the plan and the updates. Therefore, **Users** should place no reliance on the plan or the updates showing a set of conditions which will actually arise in real time.

(i) Information Release to each **Network Operator** and **Non-Embedded Customer**

~~(i)~~ ~~The following~~ This paragraph (i) contains alternative requirements on **NGC**, paragraph (z) being an alternative to a combination of paragraphs (x) and (y). Paragraph (z) will only apply in relation to a particular **User** if **NGC** and that **User** agree that it should apply, in which case paragraphs (x) and (y) will not apply. In the absence of any relevant agreement between **NGC** and the **User, NGC** will only be required to comply with paragraphs (x) and (y).

~~Information Release to each **Network Operator** and **Non-Embedded Customer**~~

Between the end of Week 34 and 49 **NGC** will upon written request:

(x) for radial systems, provide each **Network Operator** and **Non Embedded Customer** with data to allow the calculation by the **Network Operator**, and each **Non Embedded Customer**, of symmetrical and asymmetrical fault levels; and

(y) for interconnected **Systems**, provide to each **Network Operator** an equivalent network, sufficient to allow the identification of symmetrical and asymmetrical fault levels, and power flows across interconnecting **User Systems** directly connected to the **NGC Transmission System**; or

System Data Exchange

(z) as part of a process to facilitate understanding of the operation of the **Total System**,

(1) **NGC** will make available to each **Network Operator**, the **NGC Transmission System Study Network Data Files** covering Year 1 ~~and 2~~ which are of relevance to that **User's System**;

(2) where **NGC** and a **User** have agreed to the use of data links between them, the making available will be by way of allowing the **User** access to take a copy of the **NGC Transmission System Study Network Data Files** once during that period. The **User** may, having taken that copy, refer to the copy as often as it wishes. Such access will be in a manner agreed by **NGC** and may be subject to separate agreements governing the manner of access. In the absence of agreement, the copy of the **NGC Transmission System Study Network Data Files** will be given to the **User** on a disc, or in hard copy, as determined by **NGC**;

(3) the data contained in the **NGC Transmission Study Network Data Files** represents **NGC's** view of indicative operating conditions only and should be used for technical analysis only on the basis that it only represents a view and that operating conditions may be different in the event;

(4) **NGC** will notify each **Network Operator**, as soon as reasonably practicable after it has updated the **NGC Transmission System Study Network Data Files** covering Year~~s~~ 1 ~~and 2~~ that it has done so, when this update falls before the next annual update under this OC2.4.1.3.3(i). **NGC** will then make available to each **Network Operator** who has received an earlier version (and in respect of whom the agreement still exists), the updated **NGC Transmission System Study Network Files** covering the balance of Years 1 and 2 which remain given the passage of time, and which are of relevance to that **User's System**. The provisions of paragraphs (2) and (3) above shall apply to the making available of these updates;

(5) the data from the **NGC Transmission System Study Network Data Files** received by each **Network Operator** must only be used by that **User** in operating that **Network Operator's User System** and must not be used for any other purpose or passed on to, or used by, any other business of that **User** or to, or by, any person within any other such business or elsewhere.

OC2.4.1.3.4 **Operational Planning Phase** - Planning in Year 0 down to the **Programming Phase** (and in the case of load transfer capability, also during the **Programming Phase**)

(a) The **NGC Transmission System** outage plan for Year ~~1~~ 1 issued under OC2.4.1.3.3 shall become the plan for Year 0 when by expiry of time Year ~~1~~1 becomes Year 0.

(b) Each **Generator** or **Network Operator** or **Non-Embedded Customer** may at any time during Year ~~0~~ 0 request **NGC** in writing for changes to the outages requested by them under OC2.4.1.3.3. In relation to that part of Year 0, excluding the period 1-7 weeks from the date of request, **NGC** shall determine whether the changes are possible and shall notify the **Generator**, **Network Operator** or **Non-Embedded Customer** in question whether this is the case as soon as possible, and in any event within 14 days of the date of receipt by **NGC** of the written request in question.

Where **NGC** determines that any change so requested is possible and notifies the relevant **User** accordingly, **NGC** will provide to each **Network Operator** and each **Generator** a copy of the request to which ~~it has~~ **NGC** agreed which relates to outages on **Systems** of **Network Operators** (other than any request made by that **Network Operator**). The information must only be used by that **Network Operator** in operating that **Network Operator's User System** and must not be used for any other purpose or passed on to, or used by, any other business of that **User** or to, or by, any person within any other such business or elsewhere.

(c) During Year 0 (including the **Programming Phase**) each **Network Operator** shall at **NGC's** request make available to **NGC** such details of automatic and manual load transfer capability of 12MW or more (averaged over any half hour) between **Grid Supply Points**.

(d) When necessary during Year 0, **NGC** will notify each **Generator** and **Network Operator** and each **Non-Embedded Customer**, in writing of those aspects of the **NGC Transmission System** outage programme in the period from the 8th week ahead to the 52nd week ahead, which may, in **NGC's** reasonable opinion, operationally affect that **Generator** (other than those aspects which may operationally affect **Embedded Small Power Stations** or **Embedded Medium Power Stations**) or **Network Operator** or **Non-Embedded Customer** including in particular proposed start dates and end dates of relevant **NGC Transmission System** outages.

NGC will also notify changes to information supplied by **NGC** pursuant to OC2.4.1.3.3(i)(x) and (y) except where in relation to a **User** information was supplied pursuant to OC2.4.1.3.3(i)(z). In that case:-

(i) **NGC** will, by way of update of the information supplied by it pursuant to OC2.4.1.3.3(i)(z), make available at the first time in Year 0 that it updates the **NGC Transmission System Study Network Data Files** in respect of Year 0 (such update being an update on what was shown in respect of Year 1 which has then become Year 0) to each **Network Operator** who has received an earlier version under OC2.4.1.3.3(i)(z) (and in respect of whom the agreement still exists), the **NGC Transmission System Study Network Data Files** covering Year 0 which are of relevance to that **User's System**.

(ii) **NGC** will notify each relevant **Network Operator**, as soon as reasonably practicable after it has updated the **NGC Transmission System Study Network Data Files** covering Year 0, that it has done so. **NGC** will then make available to each such **Network Operator**, the updated **NGC Transmission System Study Network Data Files** covering the balance of Year 0 which remains given the passage of time, and which are of relevance to that **User's System.**

(iii) The provisions of OC2.4.1.3.3(i)(z)(2), (3) and (5) shall apply to the provision of data under this part of OC2.4.1.3.4(d) as if set out in full.

NGC will also indicate where a need may exist to issue other operational instructions or notifications or **Emergency Instructions** to **Users** in accordance with **BC2** to allow the security of the **NGC Transmission System** to be maintained within the **Licence Standards**.

(e) In addition, by the end of each month during Year 0, **NGC** will provide to each **Generator** a notice containing any revisions to the final **NGC Transmission System** outage plan for Year 1, provided to the **Generator** under OC2.4.1.3.3 or previously under this provision, whichever is the more recent.

OC2.4.1.3.5 Programming Phase

(a) ~~By each Thursday (by 1600 hours)~~ By 1600 hours each Thursday

(i) **NGC** shall ~~prepare~~ continue to update a preliminary **NGC Transmission System** outage programme for the eighth week ahead, a provisional **NGC Transmission System** outage programme for the next week ahead and a final day ahead **NGC Transmission System** outage programme for the following day.

(ii) **NGC** will notify each **Generator** and **Network Operator** and each **Non-Embedded Customer**, in writing of those aspects of the preliminary **NGC Transmission System** outage programme which may operationally affect each **Generator** (other than those aspects which may operationally affect **Embedded Small Power Stations** or **Embedded Medium Power Stations**) or **Network Operator** and each **Non-Embedded Customer** including in particular proposed start dates and end dates of relevant **NGC Transmission System** outages and changes to information supplied by **NGC** pursuant to OC2.4.1.3.3(i)(x) and (y) (if OC2.4.1.3.3(i)(z) does not apply).

NGC will also indicate where a need may exist to use **Operational Intertripping**, emergency switching, emergency **Demand** management or other measures including the issuing of other operational instructions or notifications or **Emergency Instructions** to **Users** in accordance with **BC2** to allow the security of the **NGC Transmission System** to be maintained within the **Licence Standards**.

(b) By 1000 hours each Friday

Generators and **Network Operators** will discuss with **NGC** and confirm in writing to **NGC**, acceptance or otherwise of the requirements detailed under OC2.4.1.3.5.

(c) By 1600 hours each Friday

(i) **NGC** shall finalise the preliminary **NGC Transmission System** outage programme up to the seventh week ahead. **NGC** will endeavour to give as much notice as possible to a **Generator** with nuclear **Large Power Stations** which may be operationally affected by an outage which is to be included in such programme.

(ii) **NGC** shall finalise the provisional **NGC Transmission System** outage programme for the next week ahead.

(iii) **NGC** shall finalise the **NGC Transmission System** outage programme for the weekend through to the next normal working day.

(iv) In each case **NGC** will indicate the factors set out in (a)(ii) above (other than those aspects which may operationally affect **Embedded Small Power Stations** or **Embedded Medium Power Stations**) to the relevant **Generators** and **Network Operators** and **Non-Embedded Customers**.

(v) Where a **Generator** with nuclear **Large Power Stations** which may be operationally affected by the preliminary **NGC Transmission System** outage programme referred to in (i) above (acting as a reasonable operator) is concerned on grounds relating to safety about the effect which an outage within such outage programme might have on one or more of its nuclear **Large Power Stations,** it may contact **NGC** to explain its concerns and discuss whether there is an alternative way of taking that outage (having regard to technical feasibility). If there is such an alternative way, but **NGC** refuses to adopt that alternative way in taking that outage, that **Generator** may involve the **Disputes Resolution Procedure** to decide on the way the outage should be taken. If there is no such alternative way, then **NGC** may take the outage despite that **Generator's** concerns.

(d) By 1600 hours each Monday, Tuesday, ~~and~~ Wednesday~~,~~ and Thursday

(i) **NGC** shall prepare a final **NGC Transmission System** outage programme for the following day.

(ii) **NGC** shall notify each **Generator** and **Network Operator** and **Non-Embedded Customer** in writing of the factors set out in (a)(ii) above (other than those aspects which may operationally affect **Embedded Small Power Stations** or **Embedded Medium Power Stations**).

OC2.4.2 DATA REQUIREMENTS

OC2.4.2.1 When a **Statement** of **Readiness** under the **Bilateral Agreement** and/or **Construction Agreement** is submitted, and thereafter in calendar week 24 in each calendar year,

(a) each **Generator** shall in respect of each of its:-

(i) **Gensets** (in the case of the **Generation Planning Parameters**); and

(ii) **CCGT Units** within each of its **CCGT Modules** at a **Large Power Station** (in the case of the **Generator Performance Chart**)

submit to **NGC** in writing the **Generation Planning Parameters** and the **Generator Performance Chart**.

(b) Each shall meet the requirements of CC.6.3.2 and shall reasonably reflect the true operating characteristics of the **Genset**.

(c) They shall be applied (unless revised under this **OC2** or (in the case of the **Generator Performance Chart** only) **BC1** in relation to **Other Relevant Data**) from the **Completion Date,** in the case of the ones submitted with the

Statement of Readiness, and in the case of the ones submitted in calendar week 24, from the beginning of week 25 onwards.

(d) They shall be in the format indicated in Appendix 1 for these charts and as set out in Appendix 2 for the **Generation Planning Parameters**.

(e) Any changes to the **Generator Performance Chart** or **Generation Planning Parameters** should be notified to **NGC** promptly.

(e) **Generators** should note that amendments to the composition of the **CCGT Module** at **Large Power Stations** may only be made in accordance with the principles set out in PC.A.3.2.2. If in accordance with PC.A.3.2.2 an amendment is made, any consequential changes to the **Generation Planning Parameters** should be notified to **NGC** promptly.

(g) **The Generator Performance Chart** must be on a **Generating Unit** specific basis at the **Generating Unit** Stator Terminals and must include details of the **Generating Unit** transformer parameters and demonstrate the limitation on reactive capability of the **System** voltage at 3% above nominal. It must include any limitations on output due to the prime mover (both maximum and minimum) and **Generating Unit** step-up transformer.

(h) For each **CCGT Unit**, and any other **Generating Unit** whose performance varies significantly with ambient temperature, the **Generator Performance Chart** shall show curves for at least two values of ambient temperature so that **NGC** can assess the variation in performance over all likely ambient temperatures by a process of linear interpolation or extrapolation. One of these curves shall be for the ambient temperature at which the **Generating Unit**'s output, or **CCGT Module** at a **Large Power Station** output, as appropriate, equals its **Registered Capacity.**

(i) The **Generation Planning Parameters** supplied under OC2.4.2.1 shall be used by **NGC** for operational planning purposes only and not in connection with the operation of the **Balancing Mechanism** (subject as otherwise permitted in the **BCs**).

(j) Each **Generator** shall in respect of each of its **CCGT Modules** at **Large Power Stations** submit to **NGC** in writing a **CCGT Module Planning Matrix**. It shall be prepared on a best estimate basis relating to how it is anticipated the **CCGT Module** will be running and which shall reasonably reflect the true operating characteristics of the **CCGT Module.** It will be applied (unless revised under this OC2) from the **Completion Date,** in the case of the one submitted with the **Statement of Readiness,** and in the case of the one submitted in calendar week 24, from the beginning of week 31 onwards. It must show the combination of **CCGT Units** which would be running in relation to any given MW output, in the format indicated in Appendix 3.

Any changes must be notified to **NGC** promptly. **Generators** should note that amendments to the composition of the **CCGT Module** at **Large Power Stations** may only be made in accordance with the principles set out in PC.A.3.2.2. If in accordance with PC.A.3.2.2 an amendment is made, an updated **CCGT Module Planning Matrix** must be immediately submitted to **NGC** in accordance with this OC2.4.2.1(b).

The **CCGT Module Planning Matrix** will be used by **NGC** for operational planning purposes only and not in connection with the operation of the **Balancing Mechanism**.

OC2.4.2.2 Each **Network Operator** shall by 1000 hrs on the day falling seven days before each **Operational Day** inform **NGC** in writing of any changes to the circuit details called for in PC.A.2.2.1 which it is anticipated will apply on that **Operational Day** (under **BC1** revisions can be made to this data).

OC2.4.3 **NEGATIVE RESERVE ACTIVE POWER MARGINS**

OC2.4.3.1 In each calendar year, by the end of week 39 **NGC** will, taking into account the **Final Generation Outage Programme** and forecast of neutral **Output Usable** supplied by each **Generator**, issue a notice in writing to:-

(a) all **Generators** with **Large Power Stations** listing any period in which there is likely to be an unsatisfactory **System NRAPM**; and

(b) all **Generators** with **Large Power Stations** which may, in **NGC's** reasonable opinion be affected, listing any period in which there is likely to be an unsatisfactory **Localised NRAPM**, together with the identity of the relevant **System Constraint Group** or **Groups**,

within the next calendar year, together with the margin. **NGC** and each **Generator** will take these into account in seeking to co-ordinate outages for that period.

OC2.4.3.2 (a) By 0900 hours each **Business Day**

Each **Generator** shall provide **NGC** in writing with a best estimate of **Genset** inflexibility on a daily basis for the period 2 to 14 days ahead (inclusive).

(b) By 1600 hours each Wednesday

Each **Generator** shall provide **NGC** in writing with a best estimate of **Genset** inflexibility on a weekly basis for the period 2 to 7 weeks ahead (inclusive).

(c) Between 1600 hours each Wednesday and 1200 hours each Friday

(i) If **NGC**, taking into account the estimates supplied by **Generators** under (b) above, and forecast **Demand** for the period, foresees that:-

(1) the level of the **System NRAPM** for any period within the period 2 to 7 weeks ahead (inclusive) is too low, it will issue a notice in writing to all **Generators** and **Network Operators** listing any periods and levels of **System NRAPM** within that period; and/or

(2) having also taken into account the appropriate limit on transfers to and from a **System Constraint Group**, the level of **Localised NRAPM** for any period within the period 2 to 7 weeks ahead (inclusive) is too low for a particular **System Constraint Group**, it will issue a notice in writing to all **Generators** and **Network Operators** which may, in **NGC's** reasonable opinion be affected by that **Localised NRAPM**, listing any periods and levels of **Localised NRAPM** within that period. A separate notice will be given in respect of each affected **System Constraint Group**.

Outages Adjustments

(ii) **NGC** will then contact **Generators** in respect of their **Large Power Stations** to discuss outages as set out in the following paragraphs of this OC2.4.3.2.

(iii) **NGC** will contact all **Generators** in the case of low **System NRAPM** and will contact **Generators** in relation to relevant **Large Power Stations** in the case of low **Localised NRAPM**. **NGC** will raise with each **Generator** the problems it is anticipating due to the low **System NRAPM** or **Localised NRAPM** and will discuss:-

(1) whether any change is possible to the estimate of **Genset** inflexibility given under (b) above; and

(2) whether **Genset** outages can be taken to coincide with the periods of low **System NRAPM** or **Localised NRAPM** (as the case may be).

In relation to **Generators** with nuclear **Large Power Stations** the discussions on outages can include the issue of whether outages can be taken for re-fuelling purposes to coincide with the relevant low **System NRAPM** and/or **Localised NRAPM** periods.

(iv) If agreement is reached with a **Generator** (which unlike the remainder of **OC2** will constitute a binding agreement), then such **Generator** will take such outage, as agreed with **NGC**, and **NGC** will issue a revised notice in writing to the **Generators** and **Network Operators** to which it sent notices under (i) above, reflecting the changes brought about to the periods and levels of **System NRAPM** and/or **Localised NRAPM** by the agreements with **Generators**.

(d) By 1600 hours each day

(i) If **NGC**, taking into account the estimates supplied under (a) above, and forecast **Demand** for the period, foresees that:-

(1) the level of **System NRAPM** for any period within the period of 2 to 14 days ahead (inclusive) is too low, it will issue a notice in writing to all **Generators** and **Network Operators** listing the periods and levels of **System NRAPM** within those periods; and/or

(2) having also taken into account the appropriate limit on transfers to and from a **System Constraint Group**, the level of **Localised NRAPM** for any period within the period of 2 to 14 days ahead (inclusive) is too low for a particular **System Constraint Group**, it will issue a notice in writing to all **Generators** and **Network Operators** which may, in **NGC's** reasonable opinion be affected by that **Localised NRAPM**, listing any periods and levels of **Localised NRAPM** within that period. A separate notice will be given in respect of each affected **System Constraint Group**.

(ii) **NGC** will contact all **Generators** in respect of their **Large Power Stations** (or in the case of **Localised NRAPM**, all **Generators** which may, in **NGC's** reasonable opinion be affected, in respect of their relevant **Large Power Stations**) to discuss whether any change is possible to the estimate of **Genset** inflexibility given under (a) above and to consider **Large Power Station** outages to coincide with the periods of low **System NRAPM** and/or **Localised NRAPM** (as the case may be).

(e) If on the day prior to a **Operational Day**, it is apparent from the **BM Unit Data** submitted by **Users** under **BC1** that **System NRAPM** and/or **Localised NRAPM** (as the case may be) is, in **NGC's** reasonable opinion, too low, then in accordance with the procedures and requirements set out in BC1.5.5 **NGC** may contact **Users** to discuss whether changes to **Physical Notifications** are possible, and if they are, will reflect those in the operational plans for the next following **Operational Day** or will, in accordance with BC2.9.4 instruct **Generators** to **De-Synchronise** a specified **Genset** for such period. In determining which **Genset** to so instruct, **BC2** provides that **NGC** will not (other than as referred to below) consider in such determination (and accordingly shall not instruct to **De-Synchronise**) any **Genset** within an **Existing Gas Cooled Reactor Plant**. **BC2** further provides that:-

(i) NGC is permitted to instruct to **De-Synchronise** any **Gensets** within an **Existing AGR Plant** if those **Gensets** within an **Existing AGR Plant** have failed to offer to be flexible for the relevant instance at the request of **NGC** provided the request is within the **Existing AGR Plant Flexibility Limit**.

(ii) **NGC** will only instruct to **De-Synchronise** any **Gensets** within an **Existing Magnox Reactor Plant** or within an **Existing AGR Plant** (other than under (i) above) if the level of **System NRAPM** (taken together with **System** constraints) and/or **Localised NRAPM** is such that it is not possible to avoid **De-Synchronising** such **Generating Unit**, and provided the power flow across each **External Interconnection** is either at zero or results in an export of power from the **Total System**. This proviso applies in all cases in the case of **System NRAPM** and in the case of **Localised NRAPM**, only when the power flow would have a relevant effect.

OC2.4.4 FREQUENCY SENSITIVE OPERATION

By 1600 hours each Wednesday

OC2.4.4.1 Using such information as **NGC** shall consider relevant including, if appropriate, forecast **Demand**, any estimates provided by **Generators** of **Genset** inflexibility and anticipated plant mix relating to operation in **Frequency Sensitive Mode**, **NGC** shall determine for the period 2 to 7 weeks ahead (inclusive) whether it is possible that there will be insufficient **Gensets** (other than those **Gensets** within **Existing Gas Cooled Reactor Plant** which are permitted to operate in **Limited Frequency Sensitive Mode** at all times under BC3.5.3) to operate in **Frequency Sensitive Mode** for all or any part of that period.

OC2.4.4.2 BC3.5.3 explains that **NGC** permits **Existing Gas Cooled Reactor Plant** other than **Frequency Sensitive AGR Units** to operate in a **Limited Frequency Sensitive Mode** at all times.

OC2.4.4.3 If **NGC** foresees that there will be an insufficiency in **Gensets** operating in a **Frequency Sensitive Mode**, it will contact **Generators** in order to seek to agree (as soon as reasonably practicable) that all or some of the **Generating Units** comprising each **Generator's** relevant **Large Power Stations** (the MW amount being determined by **NGC** but the **Generating Units** involved being determined by the **Generator**) will take outages to coincide with such period as **NGC** shall specify to enable replacement by other **Gensets** which can operate in a **Frequency Sensitive Mode**. If agreement is reached (which unlike the remainder of OC2 will constitute a binding agreement) then such **Generator** will take such outage as agreed with **NGC**. If agreement is not reached, then the provisions of BC2.9.5 may apply.

OC2.4.5 If in **NGC's** reasonable opinion it is necessary for both the procedure set out in OC2.4.3 (relating to **System NRAPM** and **Localised NRAPM**) and in OC2.4.4 (relating to operation in **Frequency Sensitive Mode**) to be followed in any given situation, the procedure set out in OC2.4.3 will be followed first, and then the procedure set out in OC2.4.4. For the avoidance of doubt, nothing in this paragraph shall prevent either procedure from being followed separately and independently of the other.

OC2.4.6 **OPERATING MARGIN** DATA REQUIREMENTS

OC2.4.6.1 Modifications to relay settings

'Relay settings' in this OC2.4.6.1 refers to the settings of **Low Frequency Relays** in respect of **Gensets** that are available for start from standby by **Low Frequency Relay** initiation with **Fast Start Capability** agreed pursuant to the **Bilateral Agreement.**

By 1600 hours each Wednesday

A change in relay settings will be sent by **NGC** no later than 1600 hours on a Wednesday to apply from 1000 hours on the Monday following. The settings allocated to particular **Large Power Stations** may be interchanged between 49.70Hz and 49.60Hz (or such other **System Frequencies** as **NGC** may have specified) provided the overall capacity at each setting and **System** requirements can, in **NGC's** view, be met.

Between 1600 hours each Wednesday and 1200 hours each Friday

If a **Generator** wishes to discuss or interchange settings it should contact **NGC** by 1200 hours on the Friday prior to the Monday on which it would like to institute the changes to seek **NGC's** agreement. If **NGC** agrees, **NGC** will then send confirmation of the agreed new settings.

By 1500 hours each Friday

If any alterations to relay settings have been agreed, then the updated version of the current relay settings will be sent to affected **Users** by 1500 hours on the Friday prior to the Monday on which the changes will take effect. Once accepted, each **Generator** (if that **Large Power Station** is not subject to forced outage or **Planned Outage**) will abide by the terms of its latest relay settings.

In addition, **NGC** will take account of any **Large Power Station** unavailability (as notified under OC2.4.1.2 submissions) in its total **Operating Reserve** policy.

NGC may from time to time, for confirmation purposes only, issue the latest version of the current relay settings to each affected **Generator**

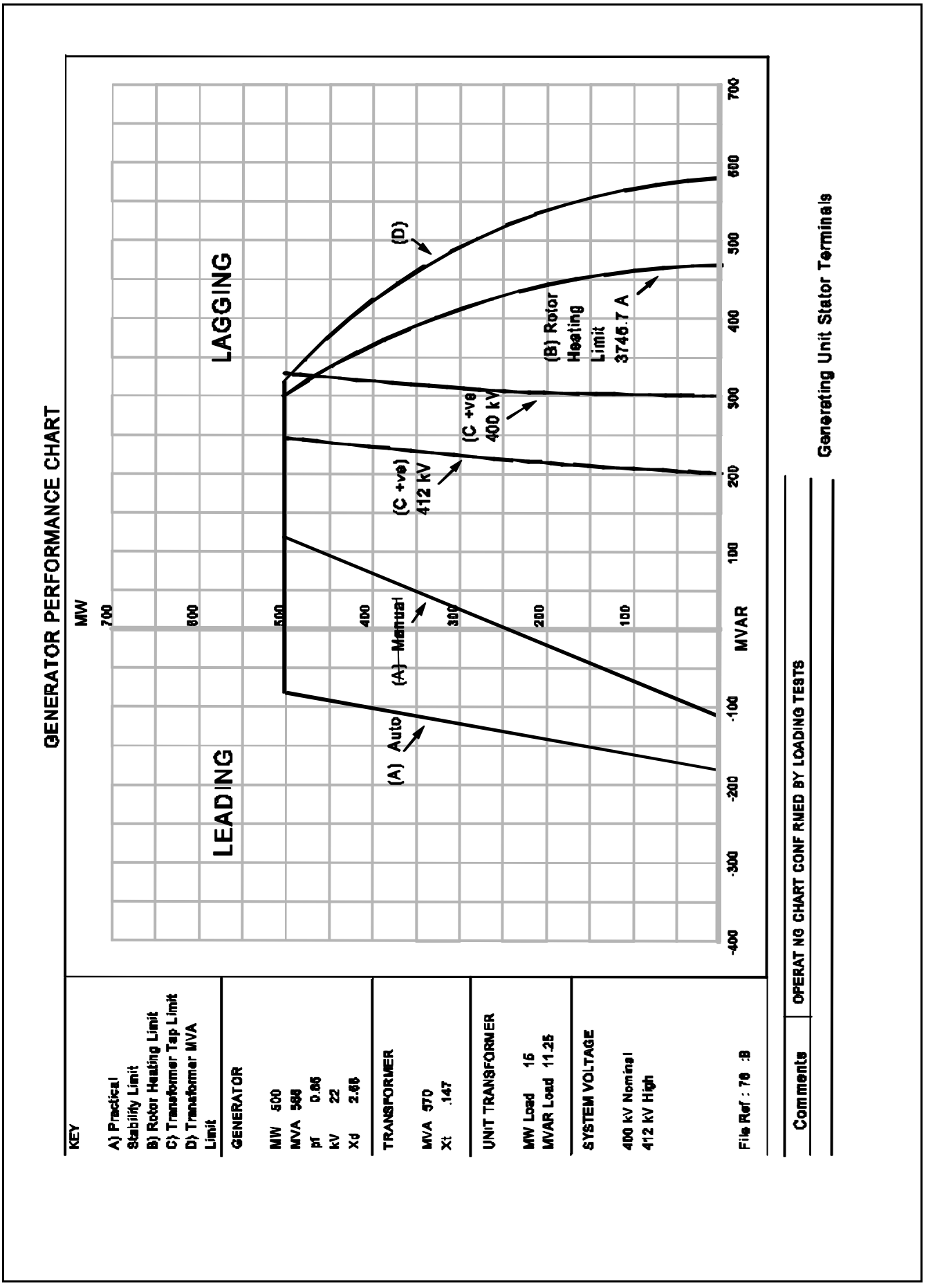
OC2.4.6.2 **Operating Margins**

By 1600 hours each Wednesday

No later than 1600 hours on a Wednesday, **NGC** will provide an indication of the level of **Operating Reserve** to be utilised by **NGC** in connection with the operation of the **Balancing Mechanism** in the week beginning with the **Operational Day** commencing during the subsequent Monday, which level shall be purely indicative.

This **Operating Margin** indication will also note the possible level of **Operating Reserve** (if any) which may be provided by **Interconnector Users** in the week beginning with the **Operational Day** commencing during the subsequent Monday.

This **Operating Margin** indication will also note the possible level of **High Frequency Response** to be utilised by **NGC** in connection with the operation of the **Balancing Mechanism** in the week beginning with the **Operational Day** commencing during the subsequent Monday, which level shall be purely indicative.


GENERATOR PERFORMANCE CHART
MW
MVAR
LEADING
LAGGING
700
600
500
400
300
200
100
-100
-200
-300
-400
(A) Auto
(A) Manual
(C +ve) 412 kV
(C +ve) 400 kV
(B) Rotor Heating Limit 3745.7 A
(D)
KEY
A) Practical Stability Limit
B) Rotor Heating Limit
C) Transformer Tap Limit
D) Transformer MVA Limit
GENERATOR
MW 500
MVA 588
pf 0.85
kV 22
Xd 2.65
TRANSFORMER
MVA 570
Xt .147
UNIT TRANSFORMER
MW Load 15
MVAR Load 11.25
SYSTEM VOLTAGE
400 kV Nominal
412 kV High
File Ref : 70 :B
Comments
OPERAT NG CHART CONF RMED BY LOADING TESTS
Generating Unit Stator Terminals

OC2 APPENDIX 2

OC2.A.2 **Generation Planning Parameters**

The following parameters are required in respect of each **Genset**.

OC2.A.2.1 Regime Unavailability

Where applicable the following information must be recorded for each **Genset**.

- Earliest synchronising time:
  Monday
  Tuesday to Friday
  Saturday to Sunday

- Latest de-synchronising time:
  Monday to Thursday
  Friday
  Saturday to Sunday

OC2.A.2.2 **Synchronising** Intervals

(a) The **Synchronising** interval between **Gensets** in a **Synchronising Group** assuming all **Gensets** have been **Shutdown** for 48 hours;

(b) The **Synchronising Group** within the **Power Station** to which each **Genset** should be allocated.

OC2.A.2.3 **De-Synchronising** Interval

A fixed value **De-Synchronising** interval between **Gensets** within a **Synchronising Group.**

OC2.A.2.4 **Synchronising Generation**

The amount of MW produced at the moment of **Synchronising** assuming the **Genset** has been **Shutdown** for 48 hours.

OC2.A.2.5 Minimum Non-zero time (MNZT)

The minimum period on-load between **Synchronising** and **De-Synchronising** assuming the **Genset** has been **Shutdown** for 48 hours.

OC2.A.2.6 Run-Up rates

A run-up characteristic consisting of up to three stages from **Synchronising Generation** to **Output Usable** with up to two intervening break points assuming the **Genset** has been **Shutdown** for 48 hours.

OC2.A.2.7 Run-down rates

A run down characteristic consisting of up to three stages from **Output Usable** to **De-Synchronising** with breakpoints at up to two intermediate load levels.

OC2.A.2.8 Notice to Deviate from Zero (NDZ)

The period of time normally required to **Synchronise** a **Genset** following instruction from **NGC** assuming the **Genset** has been **Shutdown** for 48 hours**.**

OC2.A.2.9 Minimum Zero time (MZT)

The minimum interval between **De-Synchronising** and **Synchronising** a **Genset.**

OC2.A.2.10 Two Shifting Limit

The maximum number of times that a **Genset** may **De-Synchronise** per **Operational Day**.

OC2.A.2.11 **Gas Turbine Units** loading parameters

- Loading rate for fast starting
- Loading rate for slow starting

OC2 APPENDIX 3

CCGT Module Planning Matrix example form

CCGT MODULE OUTPUT USABLE	**CCGT GENERATING UNITS** AVAILABLE								
	1st GT	2nd GT	3rd GT	4th GT	5th GT	6th GT	1st ST	2nd ST	3rd ST
	OUTPUT USABLE								
MW	150	150	150				100		
0MW to 150MW	/								
151MW to 250MW	/						/		
251MW to 300MW	/	/							
301MW to 400MW	/	/					/		
401MW to 450MW	/	/	/						
451MW to 550MW	/	/	/				/		

< End of OC2 >