

## **NATIONAL GRID TRANSCO**

### **Operating Code No. 2 Operational Planning and Data Provision**

#### **1 Purpose**

Operating Code No. 2 (“OC2”) is concerned with the exchange of specified information to facilitate and co-ordinate the planning for the safe, secure and efficient operation of the NGC Transmission System, Network Operators’ Systems and Generators’ systems.

The three elements of OC2 are:

1. The exchange of information on generator unit and system outages for outage co-ordination and system security studies;
2. Provision of Output Useable by Generators to provide NGC and Users with information on national and zonal generation and demand balance;
3. The exchange of specific technical parameters, in addition to that required by the Planning Code or elsewhere in the Grid Code, to allow system security studies to be carried out.<this section may not be required>

#### **2 Scope**

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;
- (c) Non-Embedded Customers and;
- (d) Interconnector Operators.

In the case of (d) above Interconnector Operators shall be treated as Generators for the purposes of OC2 and equivalent information shall be provided.

[NGC and Users shall ensure that the information provided under OC2 is only used for Operational Planning of the NGC Transmission System, Network Operators’ Systems and Generation Unit Outages except where required by Law or Licences and as provided for under the Balancing and Settlement Code for the publishing of aggregated OU or Outage information to the market. In general, no information will be published that reveals an individual user’s position]

The method of providing appropriate OC2 information to Users/market will be in accordance with BSC Section Q6.

The obligations under OC2 shall commence [one year?] in advance of the planned commercial operation of any new plant and apparatus that in either NGC’s or in a Users’ reasonable opinion will affect the Total System. Where a Generator releases Transmission Entry Capacity but retains Connection Entry Capacity the provisions of OC2 shall continue to apply except for those in clause 4 Operating Margins and Reserve.

In instances where the OC2 provisions state that information will be provided ‘where reasonably requested by NGC’, the default position will be that the information is not required unless specifically requested.

The timescales for information exchange under OC2 are specified in Appendix 1.

### **3 Outage Co-ordination and System Security Analysis**

#### **3.1 Purpose**

The purpose of this clause is to provide suitable and sufficient information for NGC and Users to plan the safe and secure operation of their systems and facilitate the co-ordination of outages where they may interact.

For the purpose of this [OC2 clause] the required generator unit outage information shall include each Generator Unit at Embedded and non-Embedded Large Power Stations and Medium Power Stations, including Embedded Medium Power Stations where reasonably required by NGC.

#### **3.2 Generators to NGC**

Each generator shall provide NGC in writing with the following for each planned generator unit outage:

- Outage start date, plus earliest Start Date
- Outage finish date, plus latest Finish Date
- MW output reduction from Registered Capacity

Following an unplanned outage the generator shall provide NGC in writing with the following:

- Confirmation of unplanned outage start
- Forecast return to service date
- MW output reduction from Registered Capacity

#### **3.3 Network Operators to NGC**

Each Network Operator shall provide NGC in writing details of proposed outages in its User System that may in their reasonable opinion affect the performance of the Total System. Outages of Generator Units at Embedded Medium Power Stations shall also be provided by the Network Operator where reasonably required by NGC. The outage details shall be sufficient to allow the Operational Planning of the NGC Transmission System and include Emergency Return to Service Times and any necessary demand transfers required to maintain Licence Standards.

Following an unplanned outage that may in the Network Operator's reasonable opinion affect the performance of the Total System, including the outages of Generator Units at Embedded Medium Power Stations, the Network Operator shall provide NGC in writing with the forecast return to service date.

#### **3.4 NGC to Users**

NGC shall provide each User in writing with the details of any outage on the Total System that in NGC's reasonable opinion may operationally affect the Users' System.

NGC will also indicate where a need may exist to use Operational Intertripping, emergency switching, emergency Demand management, 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.

Following an unplanned outage that may in NGC's reasonable opinion affect the Users' System NGC shall provide the User in writing with the forecast return to service date.

NGC shall prepare an Annual Outage Plan for the NGC Transmission System taking in to account the outage data supplied by Users. If in the event of Users' outages differ from those in the

Annual NGC Transmission System Outage Plan or in any way conflict with NGC's outages, NGC need not alter its Annual Outage Plan for the NGC Transmission System.

### **3.5 NGC to Generators**

NGC and each Generator operating Existing Gas Cooled Reactor Plant [extend to nuclear site licence provisions ?] shall liaise and agree the placement of outages that could affect each other's System to ensure as far as reasonably practically each party can meet their statutory and Licence obligations and [.. add BC2 refs.].

A Generator with nuclear Large Power Stations that may be operationally affected by the NGC Transmission System Outage Plan may on the grounds of safety (acting as a reasonable operator) contact NGC to explain its concerns. If an alternative cannot be agreed the Generator may invoke the Disputes Resolution Procedure. If there is no such alternative way, then NGC may take the outage despite that Generator's concerns.

### **3.6 NGC to Network Operators**

NGC shall provide each Network Operators the NGC Transmission System Study Network Data Files to allow the Network Operator to calculate asymmetrical and symmetrical fault levels and power flows across interconnecting User Systems directly connected to the NGC Transmission System. **COVERED IN SECTION 5/PC Part 3?**

## **4 Operating Margins & Reserve**

### **4.1 Purpose**

The purpose of this OC2 clause is to provide NGC and Users with the national and the zonal generation and demand balance, including NGC's operating reserve requirement.

NGC shall define and publish OC2 System Zones taking account of the disposition of Generators' Power Stations and major Transmission Constraint Boundaries. NGC shall ensure that each OC2 System Zone is defined in such a way to protect the confidentiality of each Generator's Output Useable position.

NGC shall periodically review the OC2 System Zones and may do so at the request of a User, informing all Users of the reasons for any change or reasons for retaining any Zone.

NGC shall calculate the surplus of generation over demand in each zone, including the indicative Operational Planning Margins.

### **4.2 Generators to NGC**

Each generator shall provide NGC in writing with the Output Useable for each Balancing Mechanism Unit.

Where a Generator operates [an Embedded or non-Embedded Large Power Station or] a Medium Power Station that is not a BMU, then the equivalent of Output Useable for each Power Station shall be provided.

### **4.3 Network Operator to NGC**

Each Network Operator shall provide NGC in writing with the equivalent of Output Useable for Embedded Medium Power Stations within its Network where reasonably required by NGC.

#### 4.4 NGC to Generators

NGC shall provide each Generator with aggregated Output Usable and Surplus for each OC2 Zone the Generator submits Output Useable data for, and the National Output Useable and Surplus. [reword].

NGC shall provide indicative levels of the possible Operating Reserve, including that (if any) which may be held by Interconnector Users, and possible levels High Frequency Response proposed to be held by NGC. [add NRAPM? For week ahead?]

#### 4.5 NGC to Network Operators

NGC shall provide each Network Operator with aggregated Output Usable and Surplus for each OC2 System Zone in which they have a Grid Supply Point and the National Output Useable and Surplus. [reword?].

### 5 Technical Data <potential to drop>

#### 5.1 Purpose

The purpose of this clause is to specify the technical information that is required by NGC and Users to discharge their responsibilities under OC2.

[Users shall ensure that the data from the NGC Transmission System Study Data Network Data Files must only be used by that User in operating that Users' 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 other person with any other business or elsewhere. **AS NETWORK DATA IS DEFINED IN PC4.3.2 & PC PART 3 IF THIS LIMITATION IS REQUIRED IT SHOULD BE IN THE PC**]

All OC2 data including outages and Output Useable shall be communicated in writing or such electronic format and systems as agreed between NGC and Users.

#### 5.2 Generators to NGC

Generators shall provide NGC with the data specified in Appendix 2 for all **[BMUs ONLY? OR ALL GENERATOR UNITS - NEED TO BE CLEAR BETWEEN BMU / GENSETS / GEN UNITS]**, and provide revised figures as necessary should these technical parameters change.

#### 5.3 NGC to Users

[NGC shall provide Users with the NGC Transmission System Network Data in accordance with PC.4.3.2 to allow the Network Operator to calculate asymmetrical and symmetrical fault levels and power flows across interconnecting User Systems directly connected to the NGC Transmission System. **ALTHOUGH IN OC2 NOW, AS IT IS COVERED IN THE PC ONLY REF. HERE FOR COMPLETENESS?**]

## 6 Appendix 1

Each Business Day – for the period 2 days to 49 days ahead (seven weeks)		
Time of Day (by)	Outage Co-ordination & System Security Studies	Operating Margins & Reserve
11:00	<b>Users to NGC</b> Changes to outages and new outages	<b>Generators to NGC</b> Output Useable for the daily peak demand
11:00		<b>Network Operators to NGC</b> Output Useable for Embedded Medium Power Stations
16:00	<b>NGC to Users</b> Final NGC Transmission System Outage Plan for the following day (including weekends and bank holidays as necessary)	<b>NGC to Users*</b> Provide Users with Output Useable and Surpluses for the daily peak demand
As required	<b>Users to NGC</b> Details of unplanned outages affecting the Total System with forecast return to service dates	<b>NGC to Users</b> Indication that special instructions may be required to meet Licence Standards
As required	<b>NGC to Users</b> Details of unplanned outages affecting the Total System with forecast return to service dates	
Wednesdays 16:00		<b>NGC to Generators</b> Indicative levels of Operating Reserve for the following week
Thursdays 16:00	<b>NGC to Users</b> Preliminary NGC Transmission System Outage Plan for the eighth week ahead	
Fridays 10:00	<b>Users to NGC</b> Acceptance or otherwise of Preliminary Outage Plan for the eight week ahead	
Fridays 16:00	<b>NGC to Users</b> Final NGC Transmission Outage Plan for the period out to seven weeks	

\*16:00 subject to complete information from Generators by 11:00, otherwise by 18:00.

Each Week (Business Days) – for the period eight weeks ahead to three years ahead		
Day of Week (by)	Outage Co-ordination & System Security Studies	Operating Margins & Reserve
Wednesday (11:00)		<b>Generators to NGC</b> Output Useable for the weekly peak demand
Wednesday (11:00)		<b>Network Operators to NGC</b> Output Useable for Embedded Medium Power Stations [and Demand Control] for the daily peak demand
Friday 16:00*		<b>NGC to Users</b> Output Useable and Surplus
Friday 16:00	<b>NGC to Users</b> Provide Users with major changes to the Outage Plan for ESI Weeks 8 to 52 within Current Year (Year 0)	

\*subject to complete information from Generators by 11:00, otherwise by 18:00.

Each Year or as required		
Period (by)	Outage Co-ordination & System Security Studies	Operating Margins & Reserve
Week 10	<b>Generator to NGC</b> Generation Outage Plan for Years 1 & 2	
Week 10	<b>Network Operators to NGC</b> Network Operator Outage Plan for Years 1 & 2	
Week 14	<b>NGC to Users</b> Provisional Outage Plan for Years 1 & 2 for discussions with Users on co-ordination and agreement where necessary	
Week 48	<b>NGC to Users</b> Final Outage Plan for Years 1 & 2 (Year 1 becoming the Annual Outage plan for Year 0 in ESI Week1)	
As required	<b>NGC to Users</b> Notification of new plant and apparatus including commissioning date	<b>Generators to NGC</b> Output Useable for the weekly peak demand for commissioning BMUs or re-acquisition of TEC
As required	<b>Users to NGC</b> Notification of new plant and apparatus including commissioning date, including technical data required under clause 5	<b>Network Operators to NGC</b> Output Useable for Commissioning Embedded Medium Power Stations for the daily peak demand

## 7 Appendix 2 (As per OC2.A.2 (although some of this is duplicated in BC2) <potential to drop>

### [BE CLEAR HERE GENSET OR GEN UNIT OR BMU!]

#### 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

## **8 Issues – to be covered elsewhere in the Grid Code or deleted?**

### **8.1 Negative Reserve Active Power Margins (OC2.4.3)**

1. Move NRAPM to same section as NISMs – Emergency Instructions & etc (OC7)

### **8.2 Frequency Sensitive Operation (OC2.4.4)**

1. Seek to agree genset outages to replace them with freq. sensitive gensets?
2. Remove – reference Emergency Instructions

### **8.3 Operating Margin Data Requirements (OC2.4.6)**

1. Modification of Relay Settings
2. For Gensets from standby to start by Low Frequency Relay (Fast Start) under Bilateral
3. OC2.4.6.2 Operating Margin / Operating Reserve (WOP) requires revision
4. Cover WOP in section 3.4
5. Move Relay Setting section to a more appropriate home if Bilaterals do not cover the requirements

## **9 New or Revised Terminology**

**TOTAL SYSTEM** (check definition that it includes – includes but is not limited to outages of the user system apparatus at Grid Supply Points and outages that constrain the output of Generator Units within that User system and includes generator units at [Medium] and Large Power Stations).

**OUTPUT USEABLE** The generators forecast, acting as a reasonable and prudent generator in all the circumstances, of BMU Maximum Export Limit at the time of the daily or weekly peak demand as applicable.

**Generator Unit ...**

**OUTAGE PLAN** The outage plan for all NGC's equipment and plant including Users' Outages as advised to, or agreed with, NGC where they may affect the Total System.

**INTERCONNECTOR OPERATOR** New term required?

**SYSTEM SECURITY STUDY / ANALYSIS**