# **OPERATING CODE NO. 9**

(OC9)

# **CONTINGENCY PLANNING**

## **CONTENTS**

(This contents page does not form part of the Grid Code)

Paragraph No/Title	<u>Page Number</u>
OC9.1 INTRODUCTION	2
OC9.2 OBJECTIVE	2
OC9.3 SCOPE	3
OC9.4 BLACK START	3
OC9.4.1 - OC9.4.4 Total Shutdown And Partial Shutdown	3
OC9.4.5 Black Start Stations	3
OC9.4.6 Black Start Situation	4
OC9.4.7 Black Start	4
OC9.5 RE-SYNCHRONISATION OF DE-SYNCHRONISED ISLANDS	12
OC9.5.2 Options	12
OC9.5.3 Choice Of Option	14
OC9.5.4 Agreeing Procedures	15
OC9.6 JOINT SYSTEM INCIDENT PROCEDURE	17

## OC9.1 INTRODUCTION

Operating Code No.9 ("OC9") covers the following:

## OC9.1.1 Black Starts

The implementation of recovery procedures following a **Total Shutdown** or **Partial Shutdown**.

#### OC9.1.2 Re-Synchronisation Of Islands

The Re-Synchronisation of parts of the Total System which have become Out of Synchronism with each other irrespective of whether or not a Total Shutdown or Partial Shutdown has occurred.

#### OC9.1.3 Joint System Incident Procedure

The establishment of a communication route and arrangements between senior management representatives of **NGET** and **Users** involved in, or who may be involved in, an actual or potential serious or widespread disruption to the **Total System** or a part of the **Total System**, which requires, or may require, urgent managerial response, day or night, but which does not fall within the provisions of OC9.1.4.

- It should be noted that under section 96 of the **Act** the **Secretary of State** may give directions to **NGET** and/or any **Generator** and/or any **Supplier**, for the purpose of "mitigating the effects of any civil emergency which may occur" (ie. for the purposes of planning for a civil emergency); a civil emergency is defined in the **Act** as "any natural disaster or other emergency which, in the opinion of the **Secretary of State**, is or may be likely to disrupt electricity supplies". Under the Energy Act 1976, the **Secretary of State** has powers to make orders and give directions controlling the production, supply, acquisition or use of electricity, where an Order in Council under section 3 is in force declaring that there is an actual or imminent emergency affecting electricity supplies. In the event that any such directions are given, or orders made under the **Energy Act 1976**, the provisions of the **Grid Code** will be suspended in so far as they are inconsistent with them.
- OC9.1.5 **NGET** shall procure that **Relevant Scottish Transmission Licensees** shall comply with OC9.4 and OC9.5 and any relevant **Local Joint Restoration Plan** or OC9 **De-Synchronised Island Procedure** where and to the extent that such matters apply to them.

## OC9.2 OBJECTIVE

The overall objectives of **OC9** are:

- OC9.2.1 To achieve, as far as possible, restoration of the **Total System** and associated **Demand** in the shortest possible time, taking into account **Power Station** capabilities, including **Embedded Generating Units**, **External Interconnections** and the operational constraints of the **Total System**.
- OC9.2.2 To achieve the **Re-Synchronisation** of parts of the **Total System** which have become **Out of Synchronism** with each other.
- OC9.2.3 To ensure that communication routes and arrangements are available to enable senior management representatives of **NGET** and **Users**, who are authorised to make binding decisions on behalf of **NGET** or the relevant **User**, as the case may be, to communicate with each other in the situation described in OC9.1.3.
- OC9.2.4 To describe the role that in respect of **Scottish Transmission Systems**, **Relevant Scottish Transmission Licensees** may have in the restoration processes as detailed in the relevant **OC9 De-Synchronised Island Procedures** and **Local Joint Restoration Plans**.

- OC9.2.5 To identify and address as far as possible the events and processes necessary to enable the restoration of the **Total System**, after a **Total Shutdown** or **Partial Shutdown**. This is likely to require the following key processes to be implemented, typically, but not necessarily, in the order given below:
  - (i) Selectively implement Local Joint Restoration Plans
  - (ii) Expand Power Islands to supply Power Stations
  - (iii) Expand and merge Power Islands leading to Total System energisation
  - (iv) Selectively reconnect Demand
  - (v) Facilitate and co-ordinate returning the Total System back to normal operation
  - (vi) Resumption of the **Balancing Mechanism** if suspended in accordance with the provisions of the **BSC**.

## OC9.3 SCOPE

- OC9.3.1 OC9 applies to NGET and to Users, which in OC9 means:-
  - (a) Generators;
  - (b) Network Operators; and
  - (c) Non-Embedded Customers.
- OC9.3.2 The procedure for the establishment of emergency support/contingency planning between NGET and Externally Interconnected System Operators is set out in the Interconnection Agreement with each Externally Interconnected System Operator.
- OC9.3.3 In respect of **Scottish Transmission Systems**, OC9.4 and OC9.5 also apply to **Relevant Scottish Transmission Licensees**.
- OC9.4 BLACK START

Total Shutdown And Partial Shutdown

- OC9.4.1 A "**Total Shutdown**" is the situation existing when all generation has ceased and there is no electricity supply from **External Interconnections**. Therefore, the **Total System** has shutdown with the result that it is not possible for the **Total System** to begin to function again without **NGET's** directions relating to a **Black Start**.
- A "Partial Shutdown" is the same as a Total Shutdown except that all generation has ceased in a separate part of the Total System and there is no electricity supply from External Interconnections or other parts of the Total System to that part of the Total System. Therefore, that part of the Total System is shutdown with the result that it is not possible for that part of the Total System to begin to function again without NGET's directions relating to a Black Start.
- OC9.4.3 During a **Total Shutdown** or **Partial Shutdown** and during the subsequent recovery, the **Licence Standards** may not apply and the **Total System** may be operated outside normal voltage and **Frequency** standards.
- OC9.4.4 In a **Total Shutdown** and in a **Partial Shutdown** and during the subsequent recovery, it is likely to be necessary for **NGET** to issue **Emergency Instructions** in accordance with BC2.9.
- OC9.4.5 Black Start Stations
- OC9.4.5.1 Certain Power Stations ("Black Start Stations") are registered, pursuant to the Bilateral Agreement with a User, as having an ability for at least one of its Gensets to Start-Up from Shutdown and to energise a part of the Total System, or be Synchronised to the System, upon instruction from NGET within two hours, without an external electrical power supply ("Black Start Capability").

- OC9.4.5.2 For each **Black Start Station**, a **Local Joint Restoration Plan** will be produced jointly by **NGET**, the relevant **Generator** and **Network Operator** in accordance with the provisions of OC9.4.7.12. The **Local Joint Restoration Plan** will detail the agreed method and procedure by which a **Genset** at a **Black Start Station** (possibly with other **Gensets** at that **Black Start Station**) will energise part of the **Total System** and meet complementary local **Demand** so as to form a **Power Island**.
- OC9.4.5.3 In respect of Scottish Transmission Systems, a Local Joint Restoration Plan may cover more than one Black Start Station and may be produced with and include obligations on Relevant Scottish Transmission Licensees, Generators responsible for Gensets not at a Black Start Station and other Users.

## OC9.4.6 Black Start Situation

In the event of a **Total Shutdown** or **Partial Shutdown**, **NGET** will, as soon as reasonably practical, inform **Users** (or, in the case of a **Partial Shutdown**, **Users** which in **NGET's** opinion need to be informed) and the **BSCCo** that a **Total Shutdown**, or, as the case may be, a **Partial Shutdown**, exists and that **NGET** intends to implement a **Black Start**. **NGET** shall (as soon as is practicable) determine, in its reasonable opinion, the time and date with effect from which the **Total Shutdown** or **Partial Shutdown** commenced and notify **BSCCo** of that time and date.

In the event of a **Total Shutdown** and following such notification, in accordance with the provisions of the **BSC**, the **BSCCo** will determine the **Settlement Period** with effect from which the **Balancing Mechanism** is suspended.

In the event of a **Partial Shutdown** and following such notification, the **Balancing Mechanism** will not be suspended until such time and date that the **Market Suspension Threshold** has been met, or deemed to have been met, in accordance with the provisions of the **BSC**. **NGET** shall carry out the monitoring activities required by paragraph G3.1 of the **BSC**.

Following determination by NGET pursuant to its obligations under the BSC that the Market Suspension Threshold has been met, or deemed to have been met, NGET shall (as soon as practicable) inform the BSCCo of that time and date at which the Market Suspension Threshold was met, or deemed to have been met, and the BSCCo will determine the Settlement Period in accordance with the provisions of the BSC with effect from which the Balancing Mechanism will be suspended.

Should **NGET** determine that the **Total System** is capable of returning to normal operation without meeting the **Market Suspension Threshold**, **NGET** will follow the procedure given in OC9.4.7.9.

The **Black Start** will conclude with effect from the time and date determined in accordance with OC9.4.7.10.

In respect of Scottish Transmission Systems, in exceptional circumstances, as specified in the Local Joint Restoration Plan, SPT or SHETL, may invoke such Local Joint Restoration Plan for its own Transmission System and Scottish Offshore Transmission Systems connected to it and operate within its provisions.

## OC9.4.7 Black Start

OC9.4.7.1 The procedure necessary for a recovery from a **Total Shutdown** or **Partial Shutdown** is known as a "**Black Start**". The procedure for a **Partial Shutdown** is the same as that for a **Total Shutdown** except that it applies only to a part of the **Total System**. It should be remembered that a **Partial Shutdown** may affect parts of the **Total System** which are not themselves shutdown.

OC9.4.7.2 The complexities and uncertainties of recovery from a Total Shutdown or Partial Shutdown require that OC9 is sufficiently flexible in order to accommodate the full range of Genset and **Total System** characteristics and operational possibilities, and this precludes the setting out in the Grid Code itself of concise chronological sequences. The overall strategy will, in general, include the overlapping phases of establishment of Genset(s) at an isolated Power Station, together with complementary local Demand, termed "Power Islands", step by step integration of these Power Islands into larger sub-systems which includes utilising the procedures in OC9.5 (Re-Synchronisation of De-Synchronised Island) and eventually reestablishment of the complete **Total System**.

## **NGET Instructions**

OC9.4.7.3 The procedures for a Black Start will, therefore, be those specified by NGET at the time. These will normally recognise any applicable Local Joint Restoration Plan. Users shall abide by NGET's instructions during a Black Start situation, even if these conflict with the general overall strategy outlined in OC9.4.7.2 or any applicable Local Joint Restoration **Plan. NGET's** instructions may (although this list should not be regarded as exhaustive) be to a Black Start Station relating to the commencement of generation, to a Network Operator or Non-Embedded Customer relating to the restoration of Demand, and to a Power Station relating to preparation for commencement of generation when an external power supply is made available to it, and in each case may include the requirement to undertake switching.

> In respect of Scottish Transmission Systems SPT and SHETL will act on NGET's behalf in accordance with its duties under the relevant Local Joint Restoration Plan. Scottish Users shall abide by SPT's or SHETL's instructions given in accordance with the Local Joint Restoration Plan during a Black Start situation.

#### OC9.4.7.4 (a) Black Start following a Total Shutdown or where the Balancing Mechanism has been suspended following a Partial Shutdown

During a Black Start situation where the Balancing Mechanism has been suspended, all instructions to Power Stations and to Network Operators will be deemed to be Emergency Instructions under BC2.9.2.2 (iii). All such Emergency Instructions will recognise any differing Black Start operational capabilities (however termed) set out in the relevant Ancillary Services Agreement in preference to the declared operational capability as registered pursuant to BC1 (or as amended from time to time in accordance with the BC). For the purposes of these instructions the Black Start will be an emergency circumstance under BC2.9.

In Scotland, Gensets that are not at Black Start Stations, but which are part of a Local Joint Restoration Plan, may be instructed in accordance with the provisions of that Local Joint Restoration Plan.

## (b) Black Start following a Partial Shutdown where the Balancing Mechanism has not been suspended

During a Black Start situation where the Balancing Mechanism has not been suspended, instructions in relation to Black Start Stations and to Network Operators which are part of an invoked Local Joint Restoration Plan will (unless NGET specifies otherwise) be deemed to be Emergency Instructions under BC2.9.2.2 (iv) and will recognise any differing Black Start operational capabilities (however termed) set out in the relevant Ancillary Services Agreement in preference to the declared operational capability as registered pursuant to BC1 (or as amended from time to time in accordance with the BC). For the purposes of these instructions the **Black Start** will be an emergency circumstance under BC2.9.

During a **Black Start** situation where the **Balancing Mechanism** has not been suspended, **NGET** may issue instructions to **Users** other than **Black Start Stations** and **Network Operators** which are part of an invoked **Local Joint Restoration Plan**. Such instructions would be **Emergency Instructions** pursuant to BC2.9.1.2(e)(i) subject to the requirements of BC2.9.2.2 being met.

In Scotland, **Gensets** that are not at **Black Start Stations**, but which are part of an invoked **Local Joint Restoration Plan**, may be instructed in accordance with the provisions of that **Local Joint Restoration Plan**.

(c) If during the **Demand** restoration process any **Genset** cannot, because of the **Demand** being experienced, keep within its safe operating parameters, the **Generator** shall, unless a **Local Joint Restoration Plan** is in operation, inform **NGET**. **NGET** will, where possible, either instruct **Demand** to be altered or will re-configure the **National Electricity Transmission System** or will instruct a **User** to re-configure its **System** in order to alleviate the problem being experienced by the **Generator**. If a **Local Joint Restoration Plan** is in operation, then the arrangements set out therein shall apply. However, **NGET** accepts that any decision to keep a **Genset** operating, if outside its safe operating parameters, is one for the **Generator** concerned alone and accepts that the **Generator** may change generation on that **Genset** if it believes it is necessary for safety reasons (whether relating to personnel or **Plant** and/or **Apparatus**). If such a change is made without prior notice, then the **Generator** shall inform **NGET** as soon as reasonably practical (unless a **Local Joint Restoration Plan** is in operation in which case the arrangements set out therein shall apply).

## **Embedded Power Stations**

OC9.4.7.5 Without prejudice to the provisions of OC9.4.7.8, **Network Operators** with **Embedded Power Stations** will comply with any directions of **NGET** to restore **Demand** to be met by the **Embedded Power Stations**.

## Local Joint Restoration Plan operation

- OC9.4.7.6
- (a) The following provisions apply in relation to a Local Joint Restoration Plan. As set out in OC9.4.7.3, NGET may issue instructions which conflict with a Local Joint Restoration Plan. In such cases, these instructions will take precedence over the requirements of the Local Joint Restoration Plan. When issuing such instructions, NGET shall state whether or not it wishes the remainder of the Local Joint Restoration Plan to apply. If, not withstanding that NGET has stated that it wishes the remainder of the Local Joint Restoration Plan to apply, the Generator or the relevant Network Operator consider that NGET's instructions mean that it is not possible to operate the Local Joint Restoration Plan as modified by those instructions, any of them may give notice to NGET and the other parties to the Local Joint Restoration Plan to this effect and NGET shall immediately consult with all parties to the Local Joint Restoration Plan reach an agreement forthwith as to how the Local Joint Restoration Plan shall operate in those circumstances, operation in accordance with the Local Joint Restoration Plan will terminate.
- (b) Where NGET, as part of a Black Start, has given an instruction to a Black Start Station to initiate Start-Up, the relevant Genset(s) at the Black Start Station will Start-Up in accordance with the Local Joint Restoration Plan.
- (c) NGET will advise the relevant Network Operator of the requirement to switch its User System so as to segregate its Demand and to carry out such other actions as set out in the Local Joint Restoration Plan. The relevant Network Operator will then operate in accordance with the provisions of the Local Joint Restoration Plan.
- (d) **NGET** will ensure that switching carried out on the **National Electricity Transmission System** and other actions are as set out in the **Local Joint Restoration Plan**.
- (e) Following notification from the Generator that the Black Start Station is ready to accept load, NGET will instruct the Black Start Station to energise part of the Total System. The Black Start Station and the relevant Network Operator will then, in accordance with the requirements of the Local Joint Restoration Plan, establish communication and agree the output of the relevant Genset(s) and the connection of Demand so as to establish a Power Island. During this period, the Generator will be required to regulate the output of the relevant Genset(s) at its Black Start Station to the Demand prevailing in the Power Island in which it is situated, on the basis that it will (where practicable) seek to maintain the Target Frequency. The Genset(s) at the Black Start Station will (where practical) also seek to follow the requirements relating to Reactive Power (which may include the requirement to maintain a target voltage) set out in the Local Joint Restoration Plan.
- (f) Operation in accordance with the Local Joint Restoration Plan will be terminated by NGET (by notifying the relevant Users) prior to connecting the Power Island to other Power Islands (other than, in Scotland, as allowed for in the Local Joint Restoration Plan), or to the User System of another Network Operator, or to the synchronising of Gensets at other Power Stations (other than, in Scotland, those forming part of the Local Joint Restoration Plan). Operation in accordance with the Local Joint Restoration Plan will also terminate in the circumstances provided for in OC9.4.7.6(a) if an agreement is not reached or if NGET states that it does not wish the remainder of the Local Joint Restoration Plan to apply. Users will then comply with the Bid-Offer Acceptances or Emergency Instructions of NGET.
- (g) In Scotland, Gensets included in a Local Joint Restoration Plan, but not at a Black Start Station, will operate in accordance with the requirements of the Local Joint Restoration Plan.

## Interconnection of Power Islands

- OC9.4.7.7 **NGET** will instruct the relevant **Users** so as to interconnect **Power Islands** to achieve larger sub-systems, and subsequently the interconnection of these sub-systems to form an integrated system. This should eventually achieve the re-establishment of the Total System or that part of the Total System subject to the Partial Shutdown, as the case may be. The interconnection of Power Islands and sub-systems will utilise the provisions of all or part of OC9.5 (Re-Synchronisation of De-synchronised Islands) and in such a situation such provisions will be part of the Black Start.
- OC9.4.7.8 As part of the Black Start strategy each Network Operator with either an Embedded Black Start Station which has established a Power Island within its User System or with any Embedded Power Stations within its User System which have become islanded, may in liaison with NGET sustain and expand these islands in accordance with the relevant provisions of OC9.5 which shall apply to this OC9.4 as if set out here. They will inform NGET of their actions and will not Re-Synchronise to the National Electricity Transmission **System** or any

User's System which is already Synchronised to the National Electricity Transmission System without NGET's agreement.

Return the Total System Back to Normal Operation

OC9.4.7.9 NGET shall, as soon as reasonably practical, inform Users and the BSCCo when the Total System could return to normal operation. Any such determination by NGET does not mean that the provisions of Section G paragraph 3 (Black Start) of the **BSC** shall cease to apply.

> In making the determination that the Total System could return to normal operation, NGET, would consider, amongst other things, the following areas:

- (a) the extent to which the National Electricity Transmission System is contiguous and energised;
- (b) the integrity and stability of the National Electricity Transmission System and its ability to operate in accordance with the Licence Standards;
- (c) the impact that returning to normal may have on transmission constraints and the corresponding ability to maximise the **Demand** connected; and
- (d) the volume of generation or Demand not connected to the National Electricity Transmission System; and
- (e) the functionality of normal communication systems (i.e. electronic data communication facilities, Control Telephony, etc).

In the event that the Balancing Mechanism has been suspended, it will not resume until the start of the Settlement Period determined by the BSC Panel in accordance with paragraph G3.1.2(d)(i) of the **BSC**.

For the avoidance of doubt, until resumption of the Balancing Mechanism, NGET is likely to continue to issue **Emergency Instructions** in accordance with BC2.9.

Users shall use reasonable endeavours to submit Physical notifications ten hours prior to the start of the Settlement Period determined by the BSC Panel in accordance with paragraph G3.1.2(d)(i) of the BSC and as notified by NGET to Users, in preparation for a return to normal operations.

In the event that the Balancing Mechanism has not been suspended and NGET has determined that the Total System has returned to normal operation, NGET shall inform Users and the BSCCo as soon as possible of the time and date at which (in NGET's determination) the **Total System** returned to normal operation.

#### Conclusion of Black Start

- OC9.4.7.10 The provisions of this **OC9** shall cease to apply with effect from either:
  - (a) Where the **Balancing Mechanism** was suspended, the start of the **Settlement Period** that the **Balancing Mechanism** resumed normal operation, as determined by the **BSC Panel** and notified by the **BSCCo** in accordance with the provisions of the **BSC**; or
  - (b) Where the **Balancing Mechanism** was not suspended, the end of the **Settlement Period** determined and notified by the **BSCo** (in accordance with the provisions of the **BSC**) and corresponding to the time and date that **NGET** determined that the **Total System** had returned to normal operation.

### **Externally Interconnected System Operators**

OC9.4.7.11 During a **Black Start**, **NGET** will, pursuant to the **Interconnection Agreement** with **Externally Interconnected System Operators**, agree with **Externally Interconnected System Operators** when their transmission systems can be **Re-Synchronised** to the **Total System**, if they have become separated.

## OC9.4.7.12 Local Joint Restoration Plan Establishment

(a) In England and Wales, in relation to each Black Start Station, NGET, the Network Operator and the relevant Generator will discuss and agree a Local Joint Restoration Plan. Where at the date of the first inclusion of this OC9.4.7.12 into the Grid Code a local plan covering the procedures to be covered in a Local Joint Restoration Plan is in existence and agreed, NGET will discuss this with the Network Operator and the relevant Generator to agree whether it is consistent with the principles set out in this OC9.4. If it is agreed to be so consistent, then it shall become a Local Joint Restoration Plan under this OC9 and the relevant provisions of OC9.4.7.12(b) shall apply. If it is not agreed to be so consistent, then the provisions of OC9.4.7.12(b) shall apply as if there is no Local Joint Restoration Plan in place.

In respect of Scottish Transmission Systems where a requirement for a Local Joint Restoration Plan is identified, NGET, the Relevant Scottish Transmission Licensee(s), the Network Operator and Black Start Station(s) will discuss and agree a Local Joint Restoration Plan. In addition other Users, including other Generators, may be reasonably required by NGET to discuss and agree a Local Joint Restoration Plan.

- (b) In England and Wales, where the need for a **Local Joint Restoration Plan** arises when there is none in place, the following provisions shall apply:
  - (i) NGET, the Network Operator and the relevant Generator will discuss and agree the detail of the Local Joint Restoration Plan as soon as the requirement for a Local Joint Restoration Plan is identified by NGET. NGET will notify all affected Users, and will initiate these discussions.
  - (ii) Each Local Joint Restoration Plan will be in relation to a specific Black Start Station.
  - (iii) The Local Joint Restoration Plan will record which Users and which User Sites are covered by the Local Joint Restoration Plan and set out what is required from NGET and each User should a Black Start situation arise.
  - (iv) Each **Local Joint Restoration Plan** shall be prepared by **NGET** to reflect the above discussions and agreement.
  - (v) Each page of the **Local Joint Restoration Plan** shall bear a date of issue and the issue number.

- (vi) When a Local Joint Restoration Plan has been prepared, it shall be sent by NGET to the Users involved for confirmation of its accuracy.
- (vii) The Local Joint Restoration Plan shall then (if its accuracy has been confirmed) be signed on behalf of NGET and on behalf of each relevant User by way of written confirmation of its accuracy.
- (viii) Once agreed under this OC9.4.7.12, the procedure will become a Local Joint Restoration Plan under the Grid Code and (subject to any change pursuant to this OC9) will apply between NGET and the relevant Users as if it were part of the Grid Code.
- (ix) Once signed, a copy of the Local Joint Restoration Plan will be distributed by NGET to each User which is a party to it accompanied by a note indicating the date of implementation.
- (x) **NGET** and **Users** must make the **Local Joint Restoration Plan** readily available to the relevant operational staff.
- (xi) If NGET, or any User which is a party to a Local Joint Restoration Plan, becomes aware that a change is needed to that Local Joint Restoration Plan, it shall (in the case of NGET) initiate a discussion between NGET and the relevant Users to seek to agree the relevant change. If a User becomes so aware, it shall contact NGET who will then initiate such discussions. The principles applying to establishing a new Local Joint Restoration Plan under this OC9.4.7.12 shall apply to such discussions and to any consequent changes.
- (xii) **NGET**, the **Network Operator** and the relevant **Generator** will conduct regular joint exercises of the **Local Joint Restoration Plan** to which they are parties. The objectives of such exercises include:
  - To test the effectiveness of the Local Joint Restoration Plan;
  - To provide for joint training of the parties in respect of the Local Joint Restoration Plan;
  - To maintain the parties' awareness and familiarity of the Local Joint Restoration Plan;
  - To promote understanding of each parties' roles under a **Local Joint Restoration Plan**;
  - To identify any improvement areas which should be incorporated in to the Local Joint Restoration Plan.
  - The principles applying to the establishment of a new Local Joint Restoration Plan under this OC9.4.7.12 shall apply to any changes to the Local Joint Restoration Plan.

**NGET** will propose to the parties of a **Local Joint Restoration Plan** a date for the exercise to take place, to be agreed with the other parties. All the **Local Joint Restoration Plan** parties will jointly share the task of planning, preparing, participating in and facilitating the exercises, which will normally be in desktop format or as otherwise agreed. The precise timing of the exercise for each **Local Joint Restoration Plan** will be agreed by all parties, but will not be less than one every 8 years.

(c) In respect of **Scottish Transmission Systems**, where the need for a **Local Joint Restoration Plan** arises, the following provisions shall apply:

- (i) NGET, the Relevant Scottish Transmission Licensee(s), the Network Operator and the relevant Generator will discuss and agree the detail of the Local Joint Restoration Plan as soon as the requirement for a Local Joint Restoration Plan is identified by NGET. In addition other Scottish Users, including other Generators, may be reasonably required by NGET to discuss and agree details of the Local Joint Restoration Plan as soon as the requirement for a Local Joint Restoration Plan is identified by NGET. NGET will notify the Relevant Scottish Transmission Licensee(s) and all affected Scottish Users, and will initiate these discussions.
- (ii) Each Local Joint Restoration Plan may be in relation to either a specific Black Start Station or a number of Black Start Stations, and may include Gensets at Power Stations other than a Black Start Station.
- (iii) The Local Joint Restoration Plan will record which Scottish Users and which Scottish User Sites are covered by the Local Joint Restoration Plan and set out what is required from NGET, the Relevant Scottish Transmission Licensee(s) and each Scottish User should a Black Start situation arise.
- (iv) Each **Local Joint Restoration Plan** shall be prepared by **NGET** to reflect the above discussions and agreement.
- (v) Each page of the **Local Joint Restoration Plan** shall bear a date of issue and the issue number.
- (vi) When a Local Joint Restoration Plan has been prepared, it shall be sent by NGET to the Relevant Scottish Transmission Licensee(s) and Scottish Users involved for confirmation of its accuracy.
- (vii) The Local Joint Restoration Plan shall then (if its accuracy has been confirmed) be signed on behalf of NGET and on behalf of each relevant Scottish User and Relevant Scottish Transmission Licensee(s) by way of written confirmation of its accuracy.
- (viii) Once agreed under this OC9.4.7.12, the procedure will become a Local Joint Restoration Plan under the Grid Code and (subject to any change pursuant to this OC9) will apply between NGET, Relevant Scottish Transmission Licensee(s) and the relevant Scottish Users as if it were part of the Grid Code.
- (ix) Once signed, a copy of the Local Joint Restoration Plan will be distributed by NGET to the Relevant Scottish Transmission Licensee(s) and each Scottish User which is a party to it accompanied by a note indicating the date of implementation.
- (x) NGET, the Relevant Scottish Transmission Licensee(s) and Scottish Users must make the Local Joint Restoration Plan readily available to the relevant operational staff.
- (xi) If NGET, the Relevant Scottish Transmission Licensee(s) or any Scottish User which is a party to a Local Joint Restoration Plan, becomes aware that a change is needed to that Local Joint Restoration Plan, it shall (in the case of NGET) initiate a discussion between NGET, the Relevant Scottish Transmission Licensee(s) and the relevant Scottish Users to seek to agree the relevant change. If a Scottish User or a Relevant Scottish Transmission Licensee becomes so aware, it shall contact NGET who will then initiate such discussions. The principles applying to establishing a new Local Joint Restoration Plan under this OC9.4.7.12 shall apply to such discussions and to any consequent changes.
- (xii) NGET, the Relevant Scottish Transmission Licensee(s), the Network Operator and the relevant Generator will conduct regular joint exercises of the Local Joint Restoration Plan to which they are parties. The objectives of such exercises include:
  - To test the effectiveness of the Local Joint Restoration Plan;

- To provide for joint training of the parties in respect of the Local Joint Restoration Plan:
- To maintain the parties' awareness and familiarity of the Local Joint Restoration Plan:
- To promote understanding of each parties' roles under a **Local Joint Restoration Plan**:
- To identify any improvement areas which should be incorporated in to the Local Joint Restoration Plan.
- The principles applying to the establishment of a new **Local Joint Restoration Plan** under this OC9.4.7.12 shall apply to any changes to the **Local Joint Restoration Plan**.

**NGET** will propose to the parties of a **Local Joint Restoration Plan** a date for the exercise to take place, to be agreed with the other parties. All the **Local Joint Restoration Plan** parties will jointly share the task of planning, preparing, participating in and facilitating the exercises, which will normally be in desktop format or as otherwise agreed. The precise timing of the exercise for each **Local Joint Restoration Plan** will be agreed by all parties, but will not be less than one every 8 years.

## OC9.5 RE-SYNCHRONISATION OF DE-SYNCHRONISED ISLANDS

The provisions in this OC9.5 do not apply to the parts of the **Total System** that normally operate **Out of Synchronism** with the rest of the **National Electricity Transmission System**.

Further requirements, including the provision of information, applying to **Re-synchronisation** of **De-synchronised Islands** following any **Total Shutdown** or **Partial Shutdown** are detailed in OC9.5.6.

- OC9.5.1
- (a) Where parts of the Total System are Out of Synchronism with each other (each such part being termed a "De-Synchronised Island"), but there is no Total Shutdown or Partial Shutdown, NGET will instruct Users to regulate generation or Demand, as the case may be, to enable the De-Synchronised Islands to be Re-Synchronised and NGET will inform those Users when Re-Synchronisation has taken place.
- (b) As part of that process, there may be a need to deal specifically with Embedded generation in those De-Synchronised Islands. This OC9.5 provides for how such Embedded generation should be dealt with. In Scotland, this OC9.5 also provides for how Transmission connected generation in De-Synchronised Islands should be dealt with.
- (c) In accordance with the provisions of the BC, NGET may decide that, to enable Re-Synchronisation, it will issue Emergency Instructions in accordance with BC2.9 and it may be necessary to depart from normal Balancing Mechanism operation in accordance with BC2 in issuing Bid-Offer Acceptances.
- (d) The provisions of this OC9.5 shall also apply during a Black Start to the Re-Synchronising of parts of the System following a Total or Partial Shutdown, as indicated in OC9.4. In such cases, the provisions of the OC9.5 shall apply following completion and/or termination of the relevant Local Joint Restoration Plan(s) process as referred to in OC9.4.7.6(f).

#### OC9.5.2 Options

Generation in those **De-Synchronised Islands** may be dealt with in three different ways, more than one of which may be utilised in relation to any particular incident:-

## OC9.5.2.1 Indirect Data

- (a) NGET, each Generator with Synchronised (or connected and available to generate although not Synchronised) Genset(s) in the De-Synchronised Island and the Network Operator whose User System forms all or part of the De-Synchronised Island shall exchange information as set out in this OC9.5.2.1 to enable NGET to issue a Bid-Offer Acceptance or an Emergency Instruction to that Generator in relation to its Genset(s) in the De-Synchronised Island until Re-Synchronisation takes place, on the basis that it will (where practicable) seek to maintain the Target Frequency.
- (b) The information to **NGET** from the **Generator** will cover its relevant operational parameters as outlined in the **BC** and from **NGET** to the **Generator** will cover data on **Demand** and changes in **Demand** in the **De-Synchronised Island**.
- (c) The information from the **Network Operator** to **NGET** will comprise data on **Demand** in the **De-Synchronised Island**, including data on any constraints within the **De-Synchronised Island**.
- (d) NGET will keep the Network Operator informed of the Bid-Offer Acceptances or Emergency Instructions it is issuing to Embedded Genset(s) within the Network Operator's User System forming part of the De-Synchronised Island.

## OC9.5.2.2 <u>Direct Data</u>

- (a) NGET will issue an Emergency Instruction and/or a Bid-Offer Acceptance, to the Generator to "float" local Demand and maintain Frequency at Target Frequency. Under this, the Generator will be required to regulate the output of its Genset(s) at the Power Station in question to the Demand prevailing in the De-Synchronised Island in which it is situated, until Re-Synchronisation takes place, on the basis that it will (where practicable) seek to maintain the Target Frequency.
- (b) The **Network Operator** is required to be in contact with the **Generator** at the **Power Station** to supply data on **Demand** changes within the **De-Synchronised Island**.
- (c) If more than one Genset is Synchronised on the De-Synchronised Island, or is connected to the De-Synchronised Island and available to generate although not Synchronised, the Network Operator will need to liaise with NGET to agree which Genset(s) will be utilised to accommodate changes in Demand in the De-Synchronised Island. The Network Operator will then maintain contact with the relevant Generator (or Generators) in relation to that Genset(s).
- (d) The Generator at the Power Station must contact the Network Operator if the level of Demand which it has been asked to meet as a result of the Emergency Instruction and/or Bid-Offer Acceptance to "float" and the detail on Demand passed on by the Network Operator, is likely to cause problems for safety reasons (whether relating to personnel or Plant and/or Apparatus) in the operation of its Genset(s), in order that the Network Operator can alter the level of Demand which that Generator needs to meet. Any decision to operate outside any relevant parameters is one entirely for the Generator.

## OC9.5.2.3 Control Features

- (a) A system may be established in relation to a part of the National Electricity Transmission System and a Network Operator's User System, if agreed between NGET and the Network Operator and any relevant Generator(s), whereby upon a defined fault(s) occurring, manual or automatic control features will operate to protect the National Electricity Transmission System and relevant Network Operator's User System and Genset(s) and simplify the restoration of Demand in the De-Synchronised Island.
- (b) In agreeing the establishment of such a system of control features **NGET** will need to consider its impact on the operation of the **National Electricity Transmission System**.

## OC9.5.2.4 Absence of Control Features System

If a system of control features under OC9.5.2.3 has not been agreed as part of an **OC9 De-Synchronised Island Procedure** under OC9.5.4 below, **NGET** may choose to utilise the procedures set out in OC9.5.2.1 or OC9.5.2.2, or may instruct the **Genset(s)** (or some of them) in the **De-Synchronised Island** to **De-Synchronise**.

## OC9.5.3 Choice Of Option

In relation to each of the methods set out in OC9.5.2, where a **De-Synchronised Island** has come into existence and where an **OC9 De-Synchronised Island Procedure** under OC9.5.4 has been agreed, **NGET**, the **Network Operator** and relevant **Generator(s)** will operate in accordance with that **OC9 De-Synchronised Islands Procedure** unless **NGET** considers that the nature of the **De-Synchronised Island** situation is such that either:-

- (i) the OC9 De-Synchronised Island Procedure does not cover the situation; or
- (ii) the provisions of the OC9 De-Synchronised Island Procedure are not appropriate,

in which case **NGET** will instruct the relevant **Users** and the **Users** will comply with **NGET's** instructions (which in the case of **Generators** will relate to generation and in the case of **Network Operators** will relate to **Demand**).

## OC9.5.4 Agreeing Procedures

In relation to each relevant part of the **Total System**, **NGET**, the **Network Operator** and the relevant **Generator** will discuss and may agree a local procedure (an "**OC9 De-Synchronised Island Procedure**").

- OC9.5.4.1 Where there is no relevant local procedure in place at 12th May 1997, or in the case where the need for an **OC9 De-Synchronised Island Procedure** arises for the first time, the following provisions shall apply:
  - (a) NGET, the Network Operator(s) and the relevant Generator(s) will discuss the need for, and the detail of, the OC9 De-Synchronised Island Procedure. As soon as the need for an OC9 De-Synchronised Island Procedure is identified by NGET or a User, and the party which identifies such a need will notify all affected Users (and NGET, if that party is a User), and NGET will initiate these discussions.
  - (b) Each OC9 De-Synchronised Island Procedure will be in relation to a specific Grid Supply Point, but if there is more than one Grid Supply Point between NGET and the Network Operator then the OC9 De-Synchronised Island Procedure may cover all relevant Grid Supply Points. In Scotland, the OC9 De-Synchronised Island Procedure may also cover parts of the National Electricity Transmission System connected to the User's System(s) and Power Stations directly connected to the National Electricity Transmission System which are also likely to form part of the Power Island.
  - (c) The OC9 De-Synchronised Island Procedure will:
    - record which Users and which User Sites are covered by the OC9 De-Synchronised Island Procedure;
    - (ii) record which of the three methods set out in OC9.5 (or combination of the three) shall apply, with any conditions as to applicability being set out as well;
    - (iii) set out what is required from **NGET** and each **User** should a **De-Synchronised Island** arise;
    - (iv) set out what action should be taken if the OC9 De-Synchronised Island
      Procedure does not cover a particular set of circumstances and will reflect that in the absence of any specified action, the provisions of OC9.5.3 will apply;
    - (v) in respect of Scottish Transmission Systems, the OC9 De-Synchronised Island Procedure may be produced with and include obligations on the Relevant Scottish Transmission Licensee(s); and
    - (vi) in respect of Scottish Transmission Systems, where the OC9 De-Synchronised Island Procedure includes the establishment of a De-synchronised Island, describe the route for establishment of the De-Synchronised Island.
  - (d) Each **OC9 De-Synchronised Island Procedure** shall be prepared by **NGET** to reflect the above discussions.
  - (e) Each page of the **OC9 De-Synchronised Island Procedure** shall bear a date of issue and the issue number.
  - (f) When an **OC9 De-Synchronised Island Procedure** is prepared, it shall be sent by **NGET** to the **Users** involved for confirmation of its accuracy.
  - (g) The **OC9 De-Synchronised Island Procedure** shall then be signed on behalf of **NGET** and on behalf of each relevant **User** by way of written confirmation of its accuracy.
  - (h) Once agreed under this OC9.5.4.1, the procedure will become an OC9 De-Synchronised Island Procedure under the Grid Code and (subject to any change pursuant to this OC9) will apply between NGET, Relevant Transmission Licensee and the relevant Users as if it were part of the Grid Code.
  - (i) Once signed, a copy will be distributed by **NGET** to each **User** which is a party accompanied by a note indicating the issue number and the date of implementation.

- (j) **NGET** and **Users** must make the **OC9 De-Synchronised Island Procedure** readily available to the relevant operational staff.
- (k) If a new User connects to the Total System and needs to be included with an existing OC9 De-Synchronised Island Procedure, NGET will initiate a discussion with that User and the Users which are parties to the relevant OC9 De-Synchronised Island Procedure. The principles applying to a new OC9 De-Synchronised Island Procedure under this OC9.5.4.1 shall apply to such discussions and to any consequent changes.
- (I) If NGET, or any User which is a party to an OC9 De-Synchronised Island Procedure, becomes aware that a change is needed to that OC9 De-Synchronised Island Procedure, it shall (in the case of NGET) initiate a discussion between NGET and the relevant Users to seek to agree the relevant change. The principles applying to establishing a new OC9 De-Synchronised Island Procedure under this OC9.5.4.1 shall apply to such discussions and to any consequent changes. If a User becomes so aware, it shall contact NGET who will then initiate such discussions.
- (m) If in relation to any discussions, agreement cannot be reached between NGET and the relevant Users, NGET will operate the System on the basis that it will discuss which of the three methods set out in OC9.5.2.1 to OC9.5.2.3 would be most appropriate at the time, if practicable. The complexities and uncertainties of recovery from a De-Synchronised Island means that NGET will decide, having discussed the situation with the relevant Users and taking into account the fact that the three methods may not cover the situation or be appropriate, the approach which is to be followed. NGET will instruct the relevant Users and the Users will comply with NGET's instructions as provided in OC9.5.3.
- OC9.5.4.2 Where there is a relevant local procedure in place at 12th May 1997, the following provisions shall apply:
  - (a) **NGET** and the **Network Operator** and the relevant **Generator(s)** will discuss the existing procedure to see whether it is consistent with the principles set out in this OC9.5.
  - (b) If it is, then it shall become an **OC9 De-Synchronised Island Procedure** under this **OC9**, and the relevant provisions of OC9.5.4.1 shall apply.
  - (c) If it is not, then the parties will discuss what changes are needed to ensure that it is consistent, and once agreed the procedure will become an OC9 De-Synchronised Island Procedure under this OC9, and the relevant provisions of OC9.5.4.1 shall apply.
  - (d) If agreement cannot be reached between NGET and the relevant Users after a reasonable period of time, the existing procedure will cease to apply and NGET will operate the System on the basis that it will discuss which of the three methods set out in OC9.5.2.1 to OC9.5.2.3 would be most appropriate at the time, if practicable. The complexities and uncertainties of recovery from a De-Synchronised Island means that NGET will decide, having discussed the situation with the relevant Users and taking into account the fact that the three methods may not cover the situation or be appropriate, the approach which is to be followed. NGET will instruct the relevant Users and the Users will comply with NGET's instructions as provided in OC9.5.3.
- OC9.5.5 Where the National Electricity Transmission System is Out of Synchronism with the Transmission System of an Externally Interconnected System Operator, NGET will, pursuant to the Interconnection Agreement with that Externally Interconnected System Operator, agree with that Externally Interconnected System Operator when its Transmission System can be Re-Synchronised to the National Electricity Transmission System.
- OC9.5.6 Further requirements regarding **Re-synchronisation** of **De-synchronised Islands** following any **Total Shutdown** or **Partial Shutdown**

Following any **Total Shutdown** or **Partial Shutdown**, **NGET** expects that it will be necessary to interconnect **Power Islands** utilising the provisions of OC9.5. The complexities and uncertainties of recovery from a **Total Shutdown** or **Partial Shutdown** requires the provisions of OC9.5 to be flexible, however, the strategies which **NGET** will, where practicable, be seeking to follow when **Re-synchronising De-synchronised Islands** following any **Total Shutdown** or **Partial Shutdown**, include the following:

- (a) the provision of supplies to appropriate **Power Stations** to facilitate their synchronisation as soon as practicable;
- (b) energisation of a skeletal **National Electricity Transmission System**;
- (c) the strategic restoration of **Demand** in co-ordination with relevant **Network Operators**.

As highlighted in OC9.4.3, during a **Total Shutdown** or **Partial Shutdown** and during the subsequent recovery, which includes any period during which the procedures in this OC9.5 apply, the **Licence Standards** may not apply and the **Total System** may be operated outside normal voltage and **Frequency** standards.

- OC9.5.7 To manage effectively and co-ordinate the restoration strategies of the **Total System** (any **Re-Synchronisation** of **De-Synchronised Islands**) following any **Total Shutdown** or **Partial Shutdown**, requires **NGET** and relevant **Users** to undertake certain planning activities as set out below:
  - (a) NGET and Network Operators shall review on a regular basis the processes by which each Power Island will be interconnected. This is likely to cover an exchange of information regarding the typical size, location and timing requirements for Demand to be reconnected and also include details (ability to change/disable) of the low frequency trip relay settings of the Demand identified.
  - (b) Each Generator shall provide to NGET information to assist NGET in the formulation of the restoration strategies of Power Island expansion. This information shall be provided in accordance with PC.A.5.7.

## OC9.6 JOINT SYSTEM INCIDENT PROCEDURE

## OC9.6.1 A "Joint System Incident" is

- (a) an Event, wherever occurring (other than on an Embedded Small Power Station or Embedded Medium Power Station), which, in the opinion of NGET or a User, has or may have a serious and/or widespread effect.
- (b) In the case of an Event on a User(s) System(s) (other than on an Embedded Small Power Station or Embedded Medium Power Station), the effect must be on the National Electricity Transmission System, and in the case of an Event on the National Electricity Transmission System, the effect must be on a User(s) System(s) (other than on an Embedded Small Power Station or Embedded Medium Power Station).

Where an **Event** on a **User(s) System(s)** has or may have no effect on the **National Electricity Transmission System**, then such an **Event** does not fall within **OC9** and accordingly **OC9** shall not apply to it.

- OC9.6.2 (a) (i) Each **User** (other than **Generators** which only have **Embedded Small Power Stations** and/or **Embedded Medium Power Stations**) will provide in writing to **NGET**, and
  - (ii) NGET will provide in writing to each User (other than Generators which only have Embedded Small Power Stations and/or Embedded Medium Power Stations), a telephone number or numbers at which, or through which, senior management representatives nominated for this purpose and who are fully authorised to make binding decisions on behalf of NGET or the relevant User, as the case may be, can be contacted day or night when there is a Joint System Incident.

- (b) The lists of telephone numbers will be provided in accordance with the timing requirements of the **Bilateral Agreement** and/or **Construction Agreement** with that **User**, prior to the time that a **User** connects to the **National Electricity Transmission System** and must be up-dated (in writing) as often as the information contained in them changes.
- OC9.6.3 Following notification of an **Event** under **OC7**, **NGET** or a **User**, as the case may be, will, if it considers necessary, telephone the **User** or **NGET**, as the case may be, on the telephone number referred to in OC9.6.2, to obtain such additional information as it requires.
- OC9.6.4 Following notification of an **Event** under **OC7**, and/or the receipt of any additional information requested pursuant to OC9.6.3, **NGET** or a **User**, as the case may be, will determine whether or not the **Event** is a **Joint System Incident**, and, if so, **NGET** and/or the **User** may set up an **Incident Centre** in order to avoid overloading the existing **NGET** or that **User's**, as the case may be, operational/control arrangements.
- OC9.6.5 Where **NGET** has determined that an **Event** is a **Joint System Incident**, **NGET** shall, as soon as possible, notify all relevant **Users** that a **Joint System Incident** has occurred and, if appropriate, that it has established an **Incident Centre** and the telephone number(s) of its **Incident Centre** if different from those already supplied pursuant to OC9.6.2.
- OC9.6.6 If a **User** establishes an **Incident Centre** it shall, as soon as possible, notify **NGET** that it has been established and the telephone number(s) of the **Incident Centre** if different from those already supplied pursuant to OC9.6.2.
- OC9.6.7 **NGET's Incident Centre** and/or the **User's Incident Centre** will not assume any responsibility for the operation of the **National Electricity Transmission System** or **User's System**, as the case may be, but will be the focal point in **NGET** or the **User**, as the case may be, for:
  - (a) the communication and dissemination of information between **NGET** and the senior management representatives of **User(s)**; or
  - (b) between the **User** and the senior management representatives of **NGET**, as the case may be,

relating to the **Joint System Incident**. The term "**Incident Centre**" does not imply a specially built centre for dealing with **Joint System Incidents**, but is a communications focal point. During a **Joint System Incident**, the normal communication channels, for operational/control communication between **NGET** and **Users** will continue to be used.

- OC9.6.8 All communications between the senior management representatives of the relevant parties with regard to **NGET's** role in the **Joint System Incident** shall be made via **NGET's Incident Centre** if it has been established.
- OC9.6.9 All communications between the senior management representatives of **NGET** and a **User** with regard to that **User's** role in the **Joint System Incident** shall be made via that **User's Incident Centre** if it has been established.
- OC9.6.10 **NGET** will decide when conditions no longer justify the need to use its **Incident Centre** and will inform all relevant **Users** of this decision.
- OC9.6.11 Each **User** which has established an **Incident Centre** will decide when conditions no longer justify the need to use that **Incident Centre** and will inform **NGET** of this decision.

#### < END OF OPERATING CODE NO. 9 >