**Disclaimer**

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**Note:**

Text highlighted in yellow must be updated.

**Distribution List:**

SONI:

NIE:

Generator Name (update):

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# Introduction

Under SONI Grid Code Operating Code No 7 on Contingency Planning, (insert Station name) Power Station has been identified to have the ability for (insert detail of units) to start up as soon as possible after a system shut down, to energise a part of that total system and to be synchronised to the NIE System upon instruction from SONI, without an external electrical power supply.

In order for (insert Station name) to maintain black start capability, it will be necessary to ensure that the following plant will be available and in an operational condition:

* (Insert additional generator detail and remove as appropriate below)
* Associated emergency diesel generator with ready use fuel tanks full
* Unit battery systems
* Unit DC drives
* Generator and Unit Transformers
* Service water system
* AC assured supplies
* Emergency lighting and communications

# PROCEDURE

**Note:**

**The NI Power System is a live, dynamic, constantly changing system on which major changes or disturbances can occur without warning. All testing has the potential to impact the NI Power System and must be treated as such.**

**Prior to testing taking place SONI Control Room must be informed as soon as practically possible. SONI Control Room Staff reserve the right to suspend any testing if it may have a detrimental impact on the NI Power System and/or prevailing system conditions call for it.**

**Tests must be undertaken in accordance with this procedure however should a test in the procedure:**

* **have potential for a detrimental impact on the NI Power System,**
* **result in damage to the Generator’s and/or TO’s Plant and Apparatus,**
* **does not adequately demonstrate Generator Plant performance,**

**an equivalent test procedure and/or demonstration of Generating Unit capability[[1]](#footnote-1) agreed between SONI and the Generator may be undertaken to validate Grid Code compliance.**

## Summary of Black Start Test

(Complete)

### Sequence of events to energise and restart (insert Unit name) from NI Grid (Hard Start)

(Complete)

### Sequence of events to energise and restart (insert Unit name) from (insert Unit name) (Soft Start)

(Complete)

# Switching plan

(Complete)

Key for Circuit Diagrams

Red Line – Indicates multiple energised circuits

Yellow Line – Indicates de-energised circuits

Blue Line – Indicates black start circuits

# Soft Start - transformer energisation switching

(Complete if necessary)

Key for Circuit Diagrams

Red Line – Indicates multiple energised circuits

Yellow Line – Indicates de-energised circuits

Blue Line – Indicates black start circuits

# APPENDIX 1 – BLACK START TEST SHEET

## Test Sheet - Summary

**Test Date: Target Sync Time:**

 **Test Start Time:**

**Nominated Units for Test:**

**OCGT: CCGT:**

## Black Start State

**Substation:** 110 kV Substation Ready Ѻ 275 kV Substation Ready Ѻ

 Station Incomer Open Ѻ Substation supplies ready Ѻ

 110 kV Inter Bus Tx off Ѻ 275 kV Inter Bus Tx off Ѻ

 Black Start State Simulation Completed:

## Soft Start Sequence

**OCGT Circuit Breaker Closed** Ѻ

**OCGT Start Time: Voltage Limits:**

**Frequency Control: Speed Control:**

**OCGT at 2750 RPM: OCGT Voltage:**

**OCGT Excitation: Unit Board Voltage:**

## CCGT Start Sequence

**CCGT Start Time: CCGT Full Speed:**

**CCGT Sync Time: 110kV Bus Sync:**

|  |
| --- |
| **Comments:**  |
| Unit Witness signoff that this test has been carried out according to the test procedure above.Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date / Time: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| SONI Witness signoff that this test has been carried out according to the test procedure above.Signature: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date / Time: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

1. For example a simulation model of the Generator performance characteristics under the test procedure [↑](#footnote-ref-1)