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| Template change control details |
| Version | Date | Changes |
| 0.1 | 05/06/2014 | First Draft for industry comment |

**Test 45 Test Procedure**

**Measurement of Block Load**

**[Insert Unit Name] Unit (XX1)**



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# Document Revision History

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Version** | **Date** | **Comment** | **Name** | **Company** |
| 0.1 | Xx/xx/xxxx | XX | User | User |
|  |  |  |  |  |
| 1.0 | Xx/xx/xxxx | Revised to Major version for onsite testing and signoff |  | EirGrid |

# Introduction

The Unit must submit the latest version of this test procedure as published on the EirGrid or SONI website[[1]](#footnote-1).

All yellow sections must be filled in before the test procedure will be approved. All grey sections must be filled in during testing. If any test requirements or steps are unclear, or if there is an issue with meeting any requirements or carrying out any steps, please contact generator\_testing@eirgrid.com.

On the day of testing, suitably qualified technical personnel are required on site to assist in undertaking the tests. The personnel shall have the ability to:

1. Set up and disconnect the control system and instrumentation as required;
2. Ability to fully understand the Unit’s function and its relationship to the System;
3. Liaise with NCC/CHCC as required;
4. Mitigate issues arising during the test and report on system incidents.

The availability of personnel at NCC/CHCC will be necessary in order to initiate the necessary instructions for the test. NCC/CHCC will determine:

1. If network conditions allow the testing to proceed.
2. Which tests will be carried out?
3. When the tests will be carried out.

On completion of this test, the following shall be submitted to generator\_testing@eirgrid.com:

|  |  |
| --- | --- |
| **Submission** | **Timeline** |
| A scanned copy of the test procedure, as completed and signed on site on the day of testing | 1 working day |
| Test data in CSV or Excel format | 1 working day |
| Test report | 10 working days |

# Abbreviations

CHCC Castlereagh House Control Centre

NCC National Control Centre

Mvar Mega Volt Ampere – reactive

MW Mega Watt

TSO Transmission System Operator

MEC Maximum Export Capacity

RPM Revolutions Per Minute

kV kilovolt

EDIL Electronic Dispatch Instruction Logger

# Unit DATA

|  |  |
| --- | --- |
| Unit Test Coordinator | Unit to Specify Name, Company and contact details. |
| Unit name | Unit to Specify |
| Unit connection point | Unit to Specify |
| Unit connection voltage | Unit to Specify |
| Unit Fuel Type:  | Primary Fuel / Secondary Fuel, Gas / Distillate. |
| Registered Capacity | Unit to Specify |
| 10% of Registered CapacityAmend as appropriate for Interconnectors. | Unit to Specify |
| Contracted MEC | Unit to Specify |
| Installed Plant | Unit to Specify |
| House Load (estimated) | Unit to Specify |
| Block Load (estimated) | Unit to Specify |

# Eirgrid Grid Code references

|  |  |
| --- | --- |
| Grid Code Version:  | Unit to specify |

CC7.3.1.1Each **Generation Unit,** shall, as a minimum, have the following capabilities:

(q) **Block Loading** not greater than 10% of Registered Capacity

CC7.5.1.1Each **Interconnector,** shall have the following minimum capabilities, for the avoidance of doubt, additional performance capabilities are required from **OC4-System Services**:

(p) **Block Load** for an **Interconnector** not greater than the lesser of 3% of the **Interconnector Registered Capacity** or 30**MW** in either flow direction.

**Glossary:**

|  |  |
| --- | --- |
| **Block Load**  | The level of output that a **Generating Unit** immediately produces following **Synchronisation**. For avoidance of doubt, **Block Load** can equal 0 MW.  |
| **Block Load Cold**  | **Block Load** during a **Cold Start**.  |
| **Block Load for an Interconnector**  | The level of output, in either flow direction, that an **Interconnector** immediately produces following energisation. For avoidance of doubt, **Block Load** can equal 0 **MW** and can be different in either flow direction.  |
| **Block Load Hot**  | **Block Load** during a **Hot Start**.  |
| **Block Load Warm**  | **Block Load** during a **Warm Start**.  |

# SONI Grid Code references

|  |  |
| --- | --- |
| Grid Code Version:  | Unit to specify |

TECHNICAL CRITERIA FOR GENERATING UNITS CONNECTED TO THE TRANSMISSION SYSTEM OTHER THAN THOSE COMPRISED WITHIN WFPSS

CC.S1.1.3.7**Start-Up** and Ramp Rates

The block **Load** on synchronising must be no greater than 40 **MW**.

TECHNICAL CRITERIA FOR GENERATING UNITS CONNECTED TO THE DISTRIBUTION SYSTEM OTHER THAN THOSE COMPRISED WITHIN WFPSS

 CC.S1.2.3.4**Start-Up** and Ramp Rates

The block **Load** on synchronising must be no greater than 40 **MW**.

**Glossary:**

|  |  |
| --- | --- |
| **Block Load**  | The level of output that a Generating Unit immediately produces following Synchronisation. For avoidance of doubt, Block Load can equal 0 MW. |
| **Block Load Cold**  | **Block Load** during a **Cold Start**.  |
| **Block Load Hot**  | **Block Load** during a **Hot Start**.  |
| **Block Load Warm**  | **Block Load** during a **Warm Start**.  |

# site Safety requirements

The following is required for the EirGrid/SONI witness to attend site:

|  |  |
| --- | --- |
| Personal Protective Equipment Requirements1. Site Safety boots
2. Hard Hat with chin strap
3. Hi Vis
4. Arc Resistive clothing
5. Safety Glasses
6. Gloves
7. Safe Pass
 | 1. Yes / No
2. Yes / No
3. Yes / No
4. Yes / No
5. Yes / No
6. Yes / No
7. Yes / No
 |
| Site Induction requirements | Yes / No (If Yes, Unit to specify how and when the induction must carried out) |
| Any further information | Unit to specify |

# Test Description and Pre Conditions

## Purpose

This purpose of this test is to verify that the block load is compliant with the relevant Grid Code requirements.

The unit is operated at full-speed no-load and the breaker is successfully closed to connect the unit to the System and the block load recorded.

## Pass Criteria

**Ireland**

* For conventional plant in Ireland, Block Load shall be less than 10% of Registered Capacity.
* For Interconnectors in Ireland, Block Load will be less than 3% of the Interconnector Registered Capacity or 30MW in either flow direction, whichever is the lesser.

Delete reference to Interconnector or generator as appropriate.

**Northern Ireland**

* For conventional plant in Northern Ireland, Block Load shall be no greater than 40MW.

Delete reference to Ireland or Northern Ireland as appropriate.

## Instrumentation and Onsite Data Trending

All of the following trends and screenshots must be recorded by the Unit during the test. Failure to provide any of these trends will result in test cancellation.

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Signal Name** | **Sample Rate** | **Source** |
| 1 | Active Power at Connection Point (MW)  | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 2 | Reactive Power at Connection Point (Mvar) | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 3 | Active Power at Generator (MW) | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 4 | Reactive Power at Generator (Mvar) | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 5 | Generator Circuit Breaker position (Open / Closed) | Unit to specify,  | Unit to specify |
| 6 | Generator Voltage (kV) | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 7 | Turbine Speed (RPM) | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 8 | Shaft Vibration (*µ*mp-p) | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 9 | Blade Path Temperature (°C) | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 10 | Bearing Metal Temperature (°C) | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 11 | Other signals as required by the unit or by generator\_testing@eirgrid.com. | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 12 | Alarm/Event page | Print out alarms / events for duration of the test. |
| 13 | Generator Overview Screen | Print out at appropriate milestones during the test i.e. Before, during at regular intervals and after test from generator overview page on DCS |
| 14 | EDIL instructions  | Print out as logged during the test. |

## Initial Conditions and Calculations

Should “No” be answered to any of the following, contact generator\_testing@eirgrid.com and agree next steps in advance of making any corrective actions.

|  |  |  |
| --- | --- | --- |
| **No.** | **Conditions** | **Check on day of test** |
| 1 | Test Profiles have been submitted and approved by neartime@eirgrid.com. | Yes/No |
| 2 | Unit Fuel Type: Primary Fuel / Secondary Fuel, Gas / Distillate.Interconnector operation direction: Import / Export.Delete references to Interconnector or Generator as appropriate. | Yes/No |
| 3 | Normal start up support auxiliary systems are aligned and in service. | Yes/No |
| 4 | The unit will run at full speed no load at the start of the test The Interconnector will be in blocked operating mode.Delete references to Interconnector or Generator as appropriate. | Yes / No |
| 5 | Generator Circuit Breaker is Open | Yes / No |
| 6 | Required signals, as described in section 8.3 are available | Yes / No |

# Test Steps

|  |  |  |  |
| --- | --- | --- | --- |
| **Step No.** | **Action** | **Time** | **Comment** |
| 1 | Unit operator begins data recording for all trends noted in Section 8.3. |  |  |
| 2 | Unit operator contacts NCC/CHCC and requests permission to begin test and a Synchronisation instruction for via EDIL. Amend as appropriate for Interconnectors. |  |  |
| 3 | Unit operator receives EDIL instruction and synchronises the Unit. Amend as appropriate for Interconnectors. |  |  |
| 4 | Observe the Unit loading to Block Load. |  |  |
| 5 | Record Block Load MW level. |  | Block Load: \_\_\_MW |
| 6 | Unit operator contacts NCC/CHCC and requests permission to end test.  |  |  |
| 7 | Unit operator ends data recording for all trends noted in Section 8.3. |  |  |

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

1. <http://www.eirgrid.com/operations/gridcode/compliancetesting/cdgutestprocedures/#d.en.17699> [↑](#footnote-ref-1)