Verification of Output vs Ambient Conditions

[Insert Unit Name]

[Insert Three Letter Code]

Version 0.1



Contents

[1 Document Revision History 3](#_Toc2607485)

[2 Introduction 3](#_Toc2607486)

[3 Abbreviations 3](#_Toc2607487)

[4 Unit DATA 5](#_Toc2607488)

[5 Eirgrid Grid Code references 5](#_Toc2607489)

[6 SONI Grid Code references 5](#_Toc2607490)

[7 site Safety requirements 5](#_Toc2607491)

[8 Test Description and Pre Conditions 6](#_Toc2607492)

[8.1 Purpose of the Test 6](#_Toc2607493)

[8.2 Pass Criteria 6](#_Toc2607494)

[8.3 Correction Curves 6](#_Toc2607495)

[8.4 Instrumentation and Onsite Data Trending 6](#_Toc2607496)

[8.5 Initial Conditions and Calculations 7](#_Toc2607497)

[9 Test Steps 8](#_Toc2607498)

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# IPP TEST PROCEDURE VERSION History

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Document Revsion History** | | | | |
| **Revision** | **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 |

1. **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](mailto: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](mailto: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

EDIL Electronic Dispatch Instruction Logger

# Unit DATA

|  |  |
| --- | --- |
| Unit Test Coordinator | Unit to Specify Name, Company and contact details. |
| Unit name | Unit to Specify |
| Associated 110 kV Station | Unit to Specify |
| Unit connection point | Unit to Specify |
| Unit connection voltage | Unit to Specify |
| Unit Fuel Type: Primary Fuel / Secondary Fuel, Gas / Distillate. | Unit to Specify |
| Registered Capacity | Unit to Specify |
| Minimum Load | Unit to Specify |
| Contracted MEC | Unit to Specify |
| Installed Plant | Unit to Specify |

# Eirgrid Grid Code references

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

**CC.1.1** For the protection of the **Transmission System** and **Users’ Plant** and **Apparatus** directly connected to the **Transmission System**, and in order to maintain, insofar as is possible by **Good Industry Practice,** stable and secure operation of the **Transmission System** for the benefit of all **Users**, it is necessary to require certain minimum technical, design and operational criteria to be met by **Users’ Plant** and **Apparatus**

# SONI Grid Code references

# site Safety requirements

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

|  |  |
| --- | --- |
| Personal Protective Equipment Requirements   1. 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 of the Test

This purpose of this test is to verify plant output against ambient temperature.

## Pass Criteria

1. Plant output to be verified under performance test conditions per international standards
2. Test is successful based on successful execution of performance test process and verification of plant output using high accuracy performance test equipment following application of agreed corrections for test conditions.

Expected Generator Power Output:

|  |  |  |  |
| --- | --- | --- | --- |
| **Ambient Temp** | **Exhaust pressure** | **correction factor** | **Generated power turbine** |
| **°C** | **bar** |  | **MW** |
| 30 |  |  |  |
| 25 |  |  |  |
| 20 |  |  |  |
| **15** |  |  |  |
| 10 |  |  |  |
| 5 |  |  |  |

## Correction Curves

Attach correction curves for temperature, pressure and humidity.

## 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 | |
| 6 | Generator Voltage (kV) | Unit to specify, 100ms or as agreed with TSO | Unit to specify | |
| 7 | Ambient Conditions:   1. Temperature (ºC) 2. Pressure (mbar) 3. Humidity (%) | Unit to specify, 100ms or as agreed with TSO | Unit to specify | |
| 8 | Fuel Flow | Unit to specify, 100ms or as agreed with TSO | Unit to specify | |
| 9 | Other signals as required by the unit or by [generator\_testing@eirgrid.com](mailto:generator_testing@eirgrid.com). | Unit to specify, 100ms or as agreed with TSO | Unit to specify | |
| 10 | Alarm/Event page | Screenshot of alarms/events for duration of the test. | | |
| 11 | Generator Overview Screen | Screenshot at appropriate milestones during the test | | |
| 12 | EDIL instructions | Screenshot as logged during the test. | |

## Initial Conditions and Calculations

Should “No” be answered to any of the following, contact EirGrid/SONI Test Coordinator 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](mailto:neartime@eirgrid.com). | Yes/No |
| 2 | Unit Fuel Type: Primary Fuel / Secondary Fuel, Gas / Distillate. | Yes/No |
| 3 | Verify all normal start up support auxiliary systems are aligned and in service. | Yes/No |
| 4 | Required signals, as described in section 8.4 are available | Yes/No |

# Test Steps

|  |  |  |  |
| --- | --- | --- | --- |
| **Step No.** | **Action** | **Time** | **Comment** |
| 1 | Unit operator begins data recording for all trends noted in Section 8.4. |  |  |
| 2 | Unit operator contacts NCC/CHCC and requests permission to begin test and dispatch instruction to Registered Capacity via EDIL |  | Registered Capacity: \_\_\_\_\_\_\_ MW |
| 3 | Unit operator receives EDIL instruction and dispatched the Unit to Registered Capacity. |  |  |
| 4 | Monitor/trend variations in exhaust pressure |  |  |
| 5 | Monitor/trend ambient temperature changes |  |  |
| 6 | Unit operator follows NCC/CHCC instruction for **30 minutes** following time period at Minimum Load (Instruction may be Shutdown, Ramp up or maintain output). |  |  |
| 7 | Unit operator ends data recording for all trends |  |  |

|  |
| --- |
| **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)