Reliability Run

[Insert Unit Name]

[Insert Three Letter Code]

Version 0.1



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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.

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

NCC National Control Centre

CHCC Castlereagh House Control Centre

MEC Maximum Export Capacity

MVAr Mega Volt Ampere – reactive

MW Mega Watt

TSO Transmission System Operator

# 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 (kV) | Unit to Specify |
| Unit Fuel Type:  | Primary Fuel / Secondary Fuel, Gas / Distillate. |
| Registered Capacity (MW) | Unit to Specify |
| House Load (MW) | Unit to Specify |
| Contracted MEC (MW) | Unit to Specify |
| Installed Plant  | Unit to Specify |

# Eirgrid Grid Code references

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

OC.7.2.4.2.2 The **Generator** is required to provide a **Control Facility**. The **Generator** shall ensure acting in accordance with **Good Industry Practice** that the **Control Facility** is staffed at appropriate staffing levels at all times.

OC.7.2.4.2.3 The **Control Facility** shall be staffed by a **Responsible Operator(s)** who shall respond to communications from the **TSO** without undue delay (except where otherwise provided for by agreement between the **Generator** and the **TSO**, such agreement not to be unreasonably withheld) and are of suitable experience and training and are authorised to perform the following functions on behalf of the **Generator**:

(a) to accept and execute **Dispatch Instructions**;

(b) to receive and acknowledge receipt of requests, for amongst other matters, operation outside the **Declared** values of **Availability**, **Ancillary Service** capability, or **Operating Characteristics** of the **Generation Units** during **System Emergency Conditions**.

OC.10.2.2 In order to achieve the primary objective set out in OC10.2.1, OC10 establishes procedures for **Monitoring**, **Testing** and **Investigation**. In particular, this facilitates adequate assessment of each of the following:

(a) whether **Centrally Dispatched Generation Units (CDGU)**, **Interconnectors** and **Demand Side Units** comply with **Dispatch Instructions**;

(b) whether **Generators**, **Interconnectors**, **Demand Side Unit Operators** and **Generator Aggregators** are in compliance with **Declarations** of **Availability**, **Ancillary Services** capabilities, **Operating Characteristics** and any other data required to be registered by those **Generators**, **Interconnectors** and **Demand Side Unit Operators** under the **Grid Code**;

(c) whether **Power Quality** of **Users** conforms with International Electro technical Commission Standards: ‘Electromagnetic Compatibility-Limits-Limitation of emission of harmonic currents for equipment connected to medium and high voltage power supply systems [IEC/TR3 61000-3-6] and ‘Electromagnetic Compatibility-Limits-Limitation of voltage fluctuation and flicker for equipment

connected to medium and high voltage power supply systems ‘ [IEC/TR3 61000-3-7];

(d) whether **Users** are in compliance with protection requirements and protection settings under the **Grid Code, Users' Connection Agreements**, **Ancillary Service Agreements** and **System Support Agreements** between **Users** and the **TSO;**

(e) whether **Generators** have the ability to generate on **Primary Fuel** and **Secondary Fuel** (where applicable) and have the ability to carry out on on-line fuel changeover **; and**

(f) whether **Generators** have the required **Secondary Fuel** stock levels at the **Generator Site** and **Off-Site Storage Location**.

# Test Description

## Purpose of the Test

This test is to determine that the unit, in it’s final operational configuration and with its Generator Control Room operators are capable for running reliably for a defined period of time. Commissioning personel are not involved for the purposes of this test. Reliable operation is defined as:

* Generator Control room operators in control of the unit.
* The Unit running to its approved load profile (minor changes to this profile may be allowed).
* The Unit not redeclaring it’s availability at short notice or tripping while onload.
* There are no issues with the communications between the Unit and NCC (Telephone, Optel and/or EDIL).

The duration and plan of the reliability run will be dependant on the following:

* The Unit technology type.
* The refurbishment/upgrade scope of works.
* The number of modes of operation.
* The number of fuels or fuel mixes that the unit is required to run on.

This shall be agreed at project kickoff with the TSO when the testing programme has been agreed.

For reference a new large unit (e.g. a combined cycle gas turbine) the reliability run will require at least 5 days of operation on Primary and/or Secondary fuel as instructed by the TSO.

The TSO will asses the criteria listed above to determine the required Reliability Run for a New Unit or an existing Unit undergoing an upgrade or refurbishment.

It is expected that the Unit will be on the SEM Testing Tariff B for the duration of the Reliability Run.

## Pass Criteria

* The Unit running to its approved load profile. (minor changes to this profile may be allowed).
* The Unit has not redeclared it’s availability at short notice or tripped while onload.
* There are no issues with the communications between the Unit and NCC (Telephone, Optel or EDIL).

Running to an approved load profile is such that a major change to the test profile does not occur. Major changes are defined as:

1. A deviation of greater than 50 MW or 50 MVAr from the agreed profile.
2. If the profile modification/delay/advance has a material impact on the current schedule as assessed by the TSO, including;
	1. The requirement for a revised dispatch schedule.
	2. The requirement to bring on/take off another generating unit to accommodate the test.

Known changes to the profile require resubmission of the test profile to neartime@eirgrid.com for approval.

## 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.** | **Data Trending and Recording** | **Resolution** | **Source** |
| 1 | Active power at Connection (MW) | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 2 | Reactive power at Connection point (MW) | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 3 | Active Power at Generator Terminals (MW) | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 4 | Reactive Power at Generator Terminals (Mvar) | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 5 | Generator Voltage (kV) | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 6 | Turbine Speed (RPM) | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 7 | Transformer Tap position | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 8 | Generator Field Voltage | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 9 | Generator Field Current | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 10 | Stator temperatures  | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 11 | Rotor Temperature  | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 12 | Turbine / Generator Vibration | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 13 | System Voltage  | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 14 | System Frequency | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 15 | Ambient Conditions:1. Temperature (ºC)
2. Pressure (mbar)
3. Humidity (%)
 | Unit to specify, 100ms or as agreed with TSO | Unit to specify |
| 16 | Other signals as required by the unit or by generator\_testing@eirgrid.com. | Unit to specify | Unit to specify |
| 17 | Alarm/Event page | Screenshot events for duration of the test.  |
| 18 | Screen Shots: 1. Generator Overview
2. Generator Electrical process
3. GT process
4. Generator temperature process
5. Electrical operation
 | Screenshots where information is not available through the trends above |
| 19 | EDIL instructions | Screenshot as logged during the test. |

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| **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)