Operation on Primary / Secondary Mix Fuel

[Insert Unit Name]

[Insert Three Letter Code]

Version 0.1



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1. **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 will be needed at the Unit 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.

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.

In addition, the availability of personnel at NCC/CHCC will be necessary in order to initiate the necessary instructions for the test.

Following testing, 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

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  (*i.e.* T121 HV bushings) |
| Unit connection voltage | Unit to Specify |
| Unit Fuel Type: | Primary Fuel / Secondary Fuel, Gas / Distillate. |
| Primary Fuel Registered Capacity | Unit to Specify |
| Minimum Load on Secondary Fuel. | Unit to Specify |
| Minimum Load |  |

# Eirgrid references

## Grid Code References

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

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

For all applicable **Generation Units**:

(ee) The **Generation Unit** must be capable of starting up on **Secondary Fuel.** The **Generation Unit** must be capable of carrying out an online fuel changeover from **Primary Fuel** to **Secondary Fuel** at **Primary Fuel Switchover Output** in no greater than five hours. When operating on **Secondary Fuel**, the generator must be capable of operating on **Secondary Fuel** at no less than 90% of **Primary Fuel Registered Capacity**. The **Generation Unit** must also be capable of carrying out an online fuel changeover from **Secondary fuel** to **Primary Fuel** at **Secondary Fuel Switchover Output.**

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:

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 **;**

OC.10.4.4.5 Monitoring of **Primary Fuel** and **Secondary Fuel** capability, on-line changeover capability and fuel storage levels.

OC.10.5.5 The **TSO** may, from time to time, carry out **Tests** in order to determine that a **User** is complying with its **Connection Conditions**, **Registered Operating Characteristics** and **Declarations**. The **TSO** may:

(d) request **Start-Up** on **Secondary Fuel**, or on-line changeover at **Primary Fuel Switchover Output** from **Primary Fuel** to **Secondary Fuel** or from **Secondary Fuel** to **Primary Fuel** at **Secondary Fuel Switchover Output**;

**Glossary:**

|  |  |
| --- | --- |
| **Primary Fuel** | The fuel or fuels registered in accordance with the **Grid Code** as the principal fuel(s) authorised for **Energy** production by the **Generation Unit** |
| **Primary Fuel Switch Over Output** | The **MW** output, not lower than **Minimum Load** at which a **Generation Unit** can achieve a switch over from **Primary Fuel** to **Secondary Fuel.** |
| **Secondary Fuel** | The fuel or fuels registered in accordance with the **Grid Code** as the secondary or back-up fuel(s) authorised for **Energy** production by the **Generation Unit.** |
| **Secondary Fuel Switchover Output** | The **MW** output, not lower than **Minimum Load** at which a **Generation Unit** can achieve a switch over from **Secondary Fuel** to **Primary Fuel.** |
| **Off-Site Storage Location** | The site in close vicinity to the **Generator Site** where (pursuant to a lease, licence or other agreement) the **User** stores stocks of **Primary Fuel** and/or **Secondary Fuel**. A dedicated pipeline with a dedicated pump must be in place on this site between the dedicated fuel tank off-site and the **Generating Plant**. As a maximum, this **Off-Site Storage Location** should be no more than 6 km from the **Generating Plant**. |

# SONI references

## Grid Code References

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

# 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 Descriptions and Pre Conditions

## Purpose of the Test

The purpose of this test is to check the online fuel changeover capability from primary fuel to secondary fuel and from secondary fuel to primary fuel.

## Pass Criteria

1. The Unit can successfully changeover from primary fuel to secondary fuel at the fuel switchover output level.
2. The Unit can successfully changeover from secondary to primary fuel at the fuel switchover output level.

## 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** | **Sample Rate** | **Source** |
| 1 | Active power at export point (MW) | Unit to Specify (100ms or as agreed with TSO) | Unit to Specify |
| 2 | Reactive power at export point (MW) | Unit to Specify (100ms or as agreed with TSO) | Unit to Specify |
| 3 | Turbine Speed (rpm) | Unit to Specify (100ms or as agreed with TSO) | Unit to Specify |
| 4 | Fuel flow (Nm3/h,t/h | Unit to Specify (100ms or as agreed with TSO) | Unit to Specify |
| 5 | Fuel gas control valve (%) | Unit to Specify (100ms or as agreed with TSO) | Unit to Specify |
| 6 | Fuel oil control valve (%) | Unit to Specify (100ms or as agreed with TSO) | Unit to Specify |
| 7 | Water injection flow (t/h) | Unit to Specify (100ms or as agreed with TSO) | Unit to Specify |
| 8 | Water injection control valve (%) | Unit to Specify (100ms or as agreed with TSO) | Unit to Specify |
| 9 | Purge air pressure (bar) | Unit to Specify (100ms or as agreed with TSO) | Unit to Specify |
| 10 | Purge air control valve (%) | Unit to Specify (100ms or as agreed with TSO) | Unit to Specify |
| 11 | Other Signals as Required | Unit to Specify (100ms or as agreed with TSO) | Unit to Specify |
| 12 | Print out of Alarm/Event page | Before, during at regular intervals and after test from alarms page on DCS | |
| 13 | Print out of Generator Overview Screen | Before, during at regular intervals and after test from generator overview page on DCS | |
| 14 | EDIL instructions shall be printed separately | Print out as logged during the test. | |

## Initial Conditions

Should “No” be answered to any of the following, contact [generator\_testing@eirgrid.com](mailto: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](mailto:neartime@eirgrid.com). | Yes/No |
| 2 | EDIL will be used for dispatch instructions to the Unit Control Room from NCC during the test. | Yes/No |
| 3 | Verify that both Primary and Secondary Fuels are available | Yes/No |
| 4 | Normal start up support auxiliary systems are aligned and in service. | Yes/No |
| 5 | Unit is operating on Primary Fuel | Yes/No |
| 6 | Required signals, as described in section 8.3 are available. | Yes/No |

# Test Steps

|  |  |  |  |
| --- | --- | --- | --- |
| **Step No.** | **Action** | **Time** | **Comment** |
| 1 | Unit begins data recording for all trends noted in Section 8.3. |  |  |
| 2 | Unit requests permission from NCC/CHCC to proceed and requests dispatch Instruction via EDIL to minimum load (or switchover output level agreed with TSO). |  |  |
| 3 | Unit control room issues minimum load command to the Unit and records the exact time of the command. |  |  |
| 4 | Unit proceeds to minimum load |  |  |
| 5 | Unit and requests dispatch Instruction via EDIL to switch from Primary to Secondary Fuel |  |  |
| 6 | Unit control room issues fuel changeover command and records the exact time of the command |  |  |
| 7 | When the Unit reaches minimum load on Secondary Fuel note the exact time |  |  |
| 8 | Allow the Unit to stabilise on Secondary Fuel for 30 minutes |  |  |
| 9 | Unit and requests dispatch Instruction via EDIL to switch from Secondary to Primary fuel |  |  |
| 10 | Unit control room issues fuel changeover command and records the exact time of the command |  |  |
| 11 | When the Unit reaches minimum load on Primary Fuel note the exact time |  |  |
| 12 | Unit ends data recording. |  |  |
| 13 | Unit informs NCC/CHCC that test is complete. |  |  |

|  |
| --- |
| **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> [↑](#footnote-ref-1)