EIRGRID_2015 Functional Document Template (21

DSU Aggregate Test Report for

[Insert DSU Name]

Version 0.1

DISCLAIMER:

This Document contains information (and/or attachments) which may be privileged or confidential. All content is intended solely for the use of the individual or entity to whom it is addressed. If you are not the intended recipient please be aware that any disclosure, copying, distribution or use of the contents of this message is prohibited. If you suspect that you have received this Document in error please notify EirGrid or its subsidiaries immediately. EirGrid and its subsidiaries do not accept liability for any loss or damage arising from the use of this document or any reliance on the information it contains or the accuracy or up to date nature thereof. Use of this document and the information it contains is at the user’s sole risk. In addition, EirGrid and its subsidiaries strongly recommends that any party wishing to make a decision based on the content of this document should not rely solely upon data and information contained herein and should consult EirGrid or its subsidiaries in advance.

Further information can be found at: http://www.eirgridgroup.com/legal/

Table of Contents

[1 Document Version History 3](#_Toc67577729)

[2 Report Guidelines 3](#_Toc67577730)

[2.1 Purpose 3](#_Toc67577731)

[*2.2* *The Reader* 3](#_Toc67577732)

[*2.3* *Pre Submission requirements* 3](#_Toc67577733)

[2.4 Report Formatting 4](#_Toc67577734)

[*2.5* *Report Versioning* 4](#_Toc67577735)

[3 Introduction 5](#_Toc67577736)

[4 Abbreviations 5](#_Toc67577737)

[5 Operational DATA 6](#_Toc67577738)

[5.1 DSU Summary Information - Existing 6](#_Toc67577739)

[5.2 DSU Summary Information - New 6](#_Toc67577740)

[5.3 New Individual Demand site (IDS) details: 7](#_Toc67577741)

[6 Grid Code References 8](#_Toc67577742)

[7 Test Procedure and data trending 10](#_Toc67577743)

[7.1 Aggregate and Capacity Test 10](#_Toc67577744)

[7.1.1 Test Procedure 10](#_Toc67577745)

[7.1.2 Instrumentation and Onsite Data Trending 10](#_Toc67577746)

[7.1.3 Instrumentation and Onsite Data Trending 10](#_Toc67577747)

[7.2 Individual Site Test: [insert name of site] – IDS Signal Test 11](#_Toc67577748)

[7.2.1 Test Procedure 11](#_Toc67577749)

[7.3 Individual Site Test: [insert name of site] – IDS Signal Test 11](#_Toc67577750)

[7.3.1 Test Procedure 11](#_Toc67577751)

[7.4 Individual Site Progress 12](#_Toc67577752)

[8 Test Criteria Summary 13](#_Toc67577753)

[8.1 Purpose of the Test 13](#_Toc67577754)

[8.2 Pass Criteria 13](#_Toc67577755)

[9 Test Criteria Assessment 14](#_Toc67577756)

[9.1 Pass Criteria No. 1 [CC.7.4 (a)] - Response 14](#_Toc67577757)

[9.2 Pass Criteria No.2 [CC.7.4 (b)] - Ramp Up Rate 16](#_Toc67577758)

[9.3 Pass Criteria No.3 [CC.7.4 (c)] – Ramp Down Rate 18](#_Toc67577759)

[9.4 Pass Criteria No.4 [CC.7.4 (d)] – Minimum Down Time 20](#_Toc67577760)

[9.5 Pass Criteria No.5 [CC.7.4 (e)] – Maximum Down Time 22](#_Toc67577761)

[9.6 Pass Criteria No.6 [CC.7.4 (f)] – Minimum Off Time 24](#_Toc67577762)

[9.7 Pass Criteria No.7 [CC.7.4 (g)] – Response Time 26](#_Toc67577763)

[9.8 Pass Criteria No.9 28](#_Toc67577764)

[9.9 Pass Criteria No.11 28](#_Toc67577765)

[9.10 Pass Criteria No.12 30](#_Toc67577766)

[9.11 Determination of Capacity 31](#_Toc67577767)

# Document Version History

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Document Version History** | | | | |
| **Version** | **Date** | **Comment** | **Name** | **Company** |
| 0.1 | dd/mm/yyyy | First submission for review/approval | #### | #### |
|  |  |  |  |  |
|  |  |  |  |  |

# Report Guidelines

## Purpose

*DSU Aggregate test compliance is the responsibility of the DSU. The test report template provides a guideline of expected report standard to be submitted by a DSU on completion of DSU Aggregate Test programme.*

*The report shall be submitted for acceptance to* [*DSU@eirgrid.com*](mailto:DSU@eirgrid.com) *not greater than 10 business days following completion of the test programme.*

*The purpose of the report is:*

1. ***Present the data recorded during DSU Aggregate Testing***
2. ***Analyse the performance of the DSU during testing***
3. ***Assess the compliance of the DSU against the pass criteria for each test***

## *The Reader*

*The report shall be developed for technical and non-technical readers and shall follow the agreed test programme. The report is submitted to* [*DSU@eirgrid.com*](mailto:DSU@eirgrid.com)*. This template is based on the published test procedure templates on Eirgrid website which should be consulted to obtain the most recent forms. The report shall be completed by suitably qualified technical personnel who understand Grid Code Requirements.*

*Should any of the test criterion not be met then further testing will be required.*

## *Pre Submission requirements*

*The demand reduction capacity of individual demand sites without an MEC are analysed for steady state conditions accounting for the average of 4 quarter hour intervals using MRSO data in advance of the dispatch instruction. The difference between the average pre-dispatch level and the sustained uncontrollable load during dispatch over 2 hours shall be deemed the demand reduction capacity.*

*The following steps shall be carried out before submitting the report:*

1. *Identify all pass criteria as agreed in the test procedure.*
2. *Ensure that all pass criteria are correct (correct Grid Code, Code references, etc.)*
3. *Include a graph of each test.*
4. *Include a table with assessment of test data vs. criteria for each test e.g.*
   1. *Provide DSU MW Response Vs DSU MW Capacity*
   2. *Ramp Rate settings vs. measured ramp rates (MW and % of DSU response)*
   3. *Maximum and minimum down times.*
   4. *Minimum off time.*
   5. *DSU MW response time.*
   6. *Etc.*
5. *Include analysis of any fluctuations in MW response throughout test.*
6. *Address any non-compliances that can be addressed and re-tested before the deadline for achieving an Operational Certificate*
   1. *Submit the Load Profile Request Form[[1]](#footnote-1) before 10am 2 days in advance of carrying out any software update, to* [*DSU@eirgrid.com*](mailto:DSU@eirgrid.com)
   2. *Request a Grid Code Compliance Test date* [*DSU@eirgrid.com*](mailto:DSU@eirgrid.com) *in line with the existing process, noting what testing is to be carried out*
7. *Apply for time limited derogation for any non-compliance that cannot be addressed in the short term.*
8. *Update report to reflect any additional testing or derogation applications and submit to* [*DSU@eirgrid.com*](mailto:DSU@eirgrid.com)*.*

*The DSU is welcome to discuss and seek clarification of requirements or arrange a meeting prior to submission of the report.*

## Report Formatting

*The formatting and content of the report is at the discretion of DSU and shall be altered as appropriate for varying test methods or data analysis.*

*Sections that highlight ‘Include, Insert, Analyse, Explain’ identified in italics shall be completed with the relevant material.*

*Detailed graphs shall be placed on a separate page in order to maximise their size and legibility.*

*This document includes extracts from submitted test reports, as an example of analysis/performance.*

## *Report Versioning*

*Versioning of reports shall be kept to minimum; ideally there is a single version to a report. In the event that EirGrid review the submitted report (v0.1) and revert with comments (v0.2), resubmissions shall state if all EirGrid comments have been addressed in full. Where all comments cannot be addressed, the DSU shall seek a meeting with* [*DSU@eirgrid.com*](mailto:DSU@eirgrid.com)*.*

*The DSU shall inform* [*GridCode@eirgrid.com*](mailto:GridCode@eirgrid.com) *of any known non-compliances with the submission of Derogation[[2]](#footnote-2).*

# Introduction

[Insert name] DSU is currently certified for {xx.xx) MW or has no certification to date. This report is relative to an aggregate test carried out on {xx/xx/20xx} to increase the Registered capacity of the DSU to [XX] MW. The aggregate test involved the loss of [XX] IDS’s and the addition of [XX] new IDS’s.

Below is a summary of details relating to the DSU:

|  |  |  |  |
| --- | --- | --- | --- |
| DSU Company Name/Three Letter Code | XXXXXX | | |
| DSU Owner Company Name & Address | XXXXXX | | |
| DSU Owner Company contact number & E-mail address | XXXXXX  XXXXXX | | |
| DSU Registered Demand Reduction Current Capacity in MW | **Generation** | XX MW | |
| **Avoided Consumption** | XX MW | |
| **Total** | XX MW | |
| Total Number of IDS’s Currently Certified | **Generation** | XX | |
| **Avoided Consumption** | XX | |
| **Total** | XX | |
| DSU Registered Demand Reduction Capacity as part of the aggregate test in MW | **Generation** | XX MW | |
| **Avoided Consumption** | XX MW | |
| **Total** | XX | |
| Total Number of IDS’s in the Aggregate Test | **Generation** | XX | |
| **Avoided Consumption** | XX | |
| **Total** | XX | |
| List of IDS tested: Name, MPRN & Status (New, Existing, Transferred) | Site 1  Site 2  Site 3  Site 4 | MPRN  MPRN  MPRN  MPRN | New  New  Existing  Transferred |
| Derogations | DSU to specify DAID Numbers | | |

# Abbreviations

DSU Demand Side Unit

EDIL Electronic Dispatch Instruction Logger

IDS Individual Demand Site

MEC Maximum Export Capacity

MPRN Metering Point Registration Number

MRSO Meter Readings Service Operator

MW Mega Watt

NCC National Control Centre

RTU Remote Terminal Unit

TSO Transmission System Operator

# Operational DATA

The following data has been confirmed or established as a result of the Grid Code Compliance testing.

## DSU Summary Information - Existing

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DSU Name** | **Demand Side Unit Capacity (MW)** | **Demand Reduction Capability (MW)** | | **DSU Notice Time (minutes)** | **Ramp Time (minutes)** | **DSU MW Response Time (minutes)** | **Ramp Up Rate (MW/min)** | **Ramp Down Rate (MW/min)** | **Minimum Down Time (minutes)** | **Maximum Down Time (minutes)** |
| **Avoided Consumption** | **On Site Generation** |
| XXX | XXX | XXX | XXX | XXX | XXX | XXX | XXX | XXX | XXX | XXX |

## DSU Summary Information - New

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DSU Name** | **Demand Side Unit Capacity (MW)** | **Demand Reduction Capability (MW)** | | **DSU Notice Time (minutes)** | **Ramp Time (minutes)** | **DSU MW Response Time (minutes)** | **Ramp Up Rate (MW/min)** | **Ramp Down Rate (MW/min)** | **Minimum Down Time (minutes)** | **Maximum Down Time (minutes)** |
| **Avoided Consumption** | **On Site Generation** |
| XXX | XXX | XXX | XXX | XXX | XXX | XXX | XXX | XXX | XXX | XXX |

## New Individual Demand site (IDS) details:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Individual Demand Site Name** |  | **DSU** | **IDS No. 1** | **IDS No. 2** |
| **Site No.** |  |  | **1** | **2** |
| **MPRN** |  | **N/A** |  |  |
| **Maximum Import Capacity (MIC)** | **(MW)** | **0** |  |  |
| **Maximum Export Capacity (MEC)** | **(MW)** | **0** |  |  |
| **Demand Side Unit MW Capacity** | **(MW)** | **0** |  |  |
| **Demand Reduction Capability - Avoided Consumption** | **(MW)** | **0** |  |  |
| **Demand Reduction Capability - On Site Generation** | **(MW)** | **0** |  |  |

# 

# Grid Code References

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

CC.7.4 Each **Demand Side Unit** shall, as a minimum, have the following capabilities:

1. Able to provide **Demand Side Unit MW Response** between0 MW and the **Demand Side Unit MW Capacity;**
2. **Maximum Ramp Up Rate** not less than 1.67% per minute of **Demand Side Unit MW Response** as specified in the **Dispatch Instruction;**
3. **Maximum Ramp Down Rate** not less than 1.67% per minute of **Demand Side Unit MW Response** as specified in the **Dispatch Instruction;**
4. **Minimum Down Time** not greater than 30 minutes;
5. **Maximum Down Time** not less than 2 hours**;**
6. **Minimum off time** not greater than 2 hours;
7. **Demand Side Unit MW Response Time** of not greater than 1 hour,
8. maintain **Demand Side Unit MW Response** at **Transmission System Frequencies** in the range 49.5Hz to 50.5Hz;
9. maintain **Demand Side Unit MW Response** at **Transmission System Frequencies** within the range 47.5Hz to 49.5Hz and 50.5Hz to 52Hz for a duration of 60 minutes;
10. maintain **Demand Side Unit MW Response** at **Transmission System Frequencies** within the range 47.0Hz to 47.5Hz for a duration of 20 seconds required each time the Frequency is below 47.5Hz; and
11. maintain **Demand Side Unit MW Response** for a rate of change of **Transmission System Frequency** up to and including 0.5 Hz per second as measured over a rolling 500 milliseconds period.

On-site Generation operated in Continuous Parallel Mode or Shaving Mode that forms part of a Demand Side Unit, shall, as a minimum, have the following capabilities:

1. operate continuously at normal rated output at Transmission System Frequencies in the range 49.5Hz to 50.5Hz;
2. remain synchronised to the Transmission System at Transmission System Frequencies within the range 47.5Hz to 52.0Hz for a duration of 60 minutes;
3. remain synchronised to the Transmission System at Transmission System Frequencies within the range 47.0Hz to 47.5Hz for a duration of 20 seconds required each time the Frequency is below 47.5Hz; and
4. remain synchronised to the **Transmission System** during a rate of change of **Transmission System Frequency** of values up to and including 0.5 Hz per second.



CC.12.2 Signals and indications required to be provided by **Users** will include but shall not be limited to the following:

*(l), (m), (n), (o), (p), (q), (r) and (s)* are applicable to **Demand Side Unit Operators** who represent a **Demand Side Unit:**

(l) **Demand Side Unit MW Response** from **Generation**;

(m) **Demand Side Unit MW Response** from avoided **Demand** consumption;

(n) Remaining **Demand Side Unit MW Capacity**;

(o) **Demand Side Unit MW Response** from each **Demand** load with a **Demand Side Unit MW Capacity** of greater than or equal to 5 **MW**;

(p) **MW Output** from **Generation Units** with a **Capacity** greater than or equal to 5 **MW**;

(q) **Mvar Output** from **Generation Units** with a **Capacity** greater than or equal to 5 **MW** at **Individual Demand Sites** with a **Maximum Export Capacity** specified in the **Connection Agreement** or **DSO Connection Agreement** as applicable, as required by the TSO;

(r) **MW Output** from **Generation Units** on **Individual Demand Sites** with a combined **Capacity** of greater than or equal to 5 **MW**, as required by the TSO; and

(s) **Demand Side Unit MW Response** from each **Individual Demand Site** that comprises the **Demand Side Unit**, as required by the TSO.

CC.12.6 **Demand Side Unit Operators** and **Generator Aggregators** shall provide the **TSO** the specification of the method of aggregation of SCADA from multiple sites. The minimum specifications shall be agreed with the **TSO** in advance and shall include:

1. signals from **Demand Side Unit Operators** shall be relayed to the **TSO Telecommunication Interface Cabinet** which reflect the **Demand Side Unit MW Response** to an accuracy of within 1 **MW** of the actual **Demand Side Unit MW Response** within 15 seconds of change occurring to the **Demand Side Unit MW Response**;

# Test Procedure and data trending

## Aggregate and Capacity Test

### Test Procedure

A scanned copy of the agreed and signed test procedure for the aggregate test carried out on DD/MM/YYYY was submitted to [DSU@eirgrid.com](mailto:DSU@eirgrid.com).

The following comments were observed and noted during the test.

1. DSU to provide details as applicable.
2. DSU to provide details as applicable.
3. Insert Screenshot of EDIL Dispatch Instruction

### Instrumentation and Onsite Data Trending

The following data trending was recorded by the DSU during the aggregate test. All signals are relayed to the TSO RTU which reflects the Demand Side Unit MW Response to an accuracy of within 1 MW of the actual Demand Side Unit MW Response within 15 seconds of change occurring to the Demand Side Unit MW Response. **[CC.12.6 (a)]**

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Data Trending and Recording** | **Data sample resolution** | **Accuracy** |
| 1 | Total MW reduction Availability of DSU | DSU to Specify | DSU to Specify |
| 2 | Total MW Reduction achieved from Generation | DSU to Specify | DSU to Specify |
| 3 | Total MW Reduction achieved from Demand Reduction | DSU to Specify | DSU to Specify |
| 4 | Onsite Generation MW, AAAAA Generator #1 | DSU to Specify | DSU to Specify |
| 5 | Demand Reduction from site MW, DDDDDD #1 | DSU to Specify | DSU to Specify |

### Instrumentation and Onsite Data Trending

The demand reduction capacity of individual demand sites without an MEC will be analysed accounting for the average of 4 quarter hour intervals using MRSO data in advance of the dispatch instruction. The difference between the average pre-dispatch level and the sustained uncontrollable load during dispatch over 2\* (\*or other specific number – to be specified for this report by the DSU) hours shall be deemed the demand reduction capacity.

## Individual Site Test: [insert name of site] – IDS Signal Test

### Test Procedure

A scanned copy of the agreed and signed test procedure for the individual test carried out on DD/MM/YYYY was submitted to [DSU@eirgrid.com](mailto:DSU@eirgrid.com).

The following was observed and noted during the test.

|  |  |  |  |
| --- | --- | --- | --- |
| **Loading Down** | | **Loading up** | |
| Time Delay Site to DSU | XXXs | Time Delay Site to DSU | XXXs |
| Time Delay DSU to NCC |  | Time Delay DSU to NCC |  |
| Total Time Delay |  | Total Time Delay |  |
| Total MW Reduction Availability of DSU. |  | Total MW Reduction Availability of DSU. |  |
| Total MW Reduction Achieved from Generation. |  | Total MW Reduction Achieved from Generation. |  |
| Total MW Reduction Achieved from Demand Reduction. |  | Total MW Reduction Achieved from Demand Reduction. |  |

1. <Comment on Timing and Signal Accuracy>
2. <State how MW Response is calculated>.
3. Comment on any issues with communication delays
4. <Any other relevant comments>

<Insert Screenshot of EDIL Dispatch Instruction>

## Individual Site Test: [insert name of site] – IDS Signal Test

### Test Procedure

A scanned copy of the agreed and signed test procedure for the individual test carried out on DD/MM/YYYY was submitted to [DSU@eirgrid.com](mailto:DSU@eirgrid.com).

The following was observed and noted during the test.

|  |  |  |  |
| --- | --- | --- | --- |
| **Loading Down** | | **Loading up** | |
| Time Delay Site to DSU | XXXs | Time Delay Site to DSU | XXXs |
| Time Delay DSU to NCC |  | Time Delay DSU to NCC |  |
| Total Time Delay |  | Total Time Delay |  |
| Total MW Reduction Availability of DSU. |  | Total MW Reduction Availability of DSU. |  |
| Total MW Reduction Achieved from Generation. |  | Total MW Reduction Achieved from Generation. |  |
| Total MW Reduction Achieved from Demand Reduction. |  | Total MW Reduction Achieved from Demand Reduction. |  |

1. <Comment on Timing and Signal Accuracy>
2. <State how MW Response is calculated>.
3. Comment on any issues with communication delays
4. <Any other relevant comments>

Insert Screenshot of EDIL Dispatch Instruction

## Individual Site Progress

The following table summarises the progress and success of individual sites from application stage to Grid Code Compliance Test.

|  |  |  |
| --- | --- | --- |
| **IDS on Application**  **(List all sites on Application)** | **IDS Signal Test Completed**  **(Pass/Fail/Not tested)** | **Aggregate/Capacity Test Completed**  **(Pass/Fail/Not tested)** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

*[****Delete this text*** *–Outline the reason in each case for IDS’s failing to progress to Operational Certification*

# Test Criteria Summary

## Purpose of the Test

The purpose of this test is to demonstrate the DSU MW for the individual demand sites that forms part of the aggregated DSU can meet the DSU Grid Code Requirements.

## Pass Criteria

The following is the pass criteria for the test specific to Grid Code requirements. This aggregate test was assessed against each of these criteria:

|  |  |  |
| --- | --- | --- |
| **No. (Clause)** | **Grid Code Requirement** | **Status** |
| 1  [CC.7.4 (a)] | Able to provide DSU MW Response between 0 MW and the DSU MW Capacity. | Compliant / Not Compliant |
| 2  [CC.7.4 (b)] | Maximum Ramp Up Rate not less than 1.67% per minute of DSU MW Response as specified in the Dispatch Instruction. | Compliant / Not Compliant |
| 3  [CC.7.4 (c)] | Maximum Ramp Down Rate not less than 1.67% per minute of DSU MW Response as specified in the Dispatch Instruction. | Compliant / Not Compliant |
| 4  [CC.7.4 (d)] | Minimum Down Time not greater than 30 minutes. | Compliant / Not Compliant |
| 5  [CC.7.4 (e)] | Maximum Down Time not less than 2 hours. | Compliant / Not Compliant |
| 6  [CC.7.4 (f)] | Minimum off time not greater than 2 hours. | Compliant / Not Compliant |
| 7  [CC.7.4 (g)] | DSU MW Response Time of not greater than 1 hour. | Compliant / Not Compliant |
| 8  [CC.12.2] | Signals as specified in CC.12.2 are correct as per signal list. | Compliant / Not Compliant |

The following are general pass criteria for the test as detailed in the test procedure. This aggregate test was assessed against each of these criteria:

|  |  |  |
| --- | --- | --- |
| **Number** | **Grid Code Requirement** | **Status** |
| 9 | DSU control centre receives all EDIL dispatch instructions from NCC. | Compliant / Not Compliant |
| 10 | DSU communications system operates for each of the DSUs. | Compliant / Not Compliant |
| 11 | DSU commences implementation of dispatch instruction after the DSU Notice Time. | Compliant / Not Compliant |
| 12 | DSU responds to the MW instruction no Later than the DSU MW response time. | Compliant / Not Compliant |

# Test Criteria Assessment

The pass criteria as outlined in Section 8.2 above are assessed specifically for Criteria No.1 to 12.

## Pass Criteria No. 1 [CC.7.4 (a)] - Response

Grid Code requirement is the ability to provide Demand Side Unit MW Response between 0 MW and the Demand Side Unit MW Capacity

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Site** | **Start time** | **Start of the 1st 15-minute interval** | **MW at Start** | **End Time** | **Start of the 8th 15-minute interval** | **MW at End** | **Average MW Capacity** |
| IDS 1 | 10:48 |  | 3.8 | 13:02 |  | 3.8 | 3.75 |
| IDS 2 | 10:54 |  | 6.4 | 13:06 |  | 6.4 | 6.35 |
|  |  | **DSU aggregate total** | | | | | **10.1** |

*IDS Summary Table*

*DSU MW Response graph*

## Pass Criteria No.2 [CC.7.4 (b)] - Ramp Up Rate

Grid Code requirement is to illustrate Maximum Ramp Up Rate not less than 1.67% per minute of DSU MW Response as specified in the Dispatch Instruction.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **IDS Site** | **Issue Time of NCC Dispatch Instruction to Ramp** | **DSU Notice time**  **(minutes)** | **Effective Time of NCC Dispatch Instruction to Ramp** | **Notice Time** | **Ramp Start Time** | **Ramp End Time** | **MW at Ramp Start** | **MW at Ramp End** | **MW/Min** |
| IDS 1 | 10:00 |  | 10:22 | 00:22 | 10:22 | 10:34 | 0 | 6.4 | 0.533 |
| IDS 2 | 10:00 |  | 10:22 | 00:29 | 10:29 | 10:49 | 0 | 3.9 | 0.195 |

*IDS Summary Table*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DSU** | **Issue Time of NCC Dispatch Instruction to Ramp** | **DSU Notice time**  **(minutes)** | **Effective Time of NCC Dispatch Instruction to Ramp** | **Notice Time** | **Ramp Start Time** | **Ramp End Time** | **MW at Ramp Start** | **MW at Ramp End** | **MW/Min** | **% of Response/Min** |
| DSU Name | 10:00 |  | 10:22 | 10:22 | 10:22 | 10:49 | 0 | 10.3 | 0.38 | **3.7** |

*DSU Summary Table*

*Maximum Ramp Up Rate graph*

## Pass Criteria No.3 [CC.7.4 (c)] – Ramp Down Rate

Grid Code requirement is to illustrate Maximum Ramp Down Rate not less than 1.67% per minute of DSU MW Response as specified in the Dispatch Instruction.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **IDS Site** | **Issue Time of NCC Dispatch Instruction to Ramp** | **DSU Notice time**  **(minutes)** | **Effective Time of NCC Dispatch Instruction to Ramp** | **Notice Time** | **Ramp Start Time** | **Ramp End Time** | **MW at Ramp Start** | **MW at Ramp End** | **MW/Min** |
| IDS 1 | 13:00 |  | 13:11 | 00:26 | 13:26 | 13:38 | 6.4 | 0 | 0.533 |
| IDS 2 | 13:00 |  | 13:11 | 00:11 | 13:11 | 13:31 | 3.9 | 0 | 0.195 |

*IDS Summary Table*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DSU** | **Issue Time of NCC Dispatch Instruction to Ramp** | **DSU Notice time**  **(minutes)** | **Effective Time of NCC Dispatch Instruction to Ramp** | **Notice Time** | **Ramp Start Time** | **Ramp End Time** | **MW at Ramp Start** | **MW at Ramp End** | **MW/Min** | **% of Response/Min** |
| DSU Name | 13:00 |  | 13:11 | 00:11 | 13:11 | 13:38 | 10.3 | 0 | 0.381 | **3.7** |

*DSU Summary Table*

*Maximum Ramp Down Rate graph*

## Pass Criteria No.4 [CC.7.4 (d)] – Minimum Down Time

Grid Code requirement is to illustrate Minimum Down Time is not greater than 30 minutes.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IDS/DSU Name** | **Ramp End Time** | **Ramp Start Time** | **MW During Down Time** | **Min Down Time (Mins)** |
| IDS 1 | 16:37 | 17:03 | 6.3 | **25** |
| IDS 2 | 16:51 | 17:13 | 3.9 | **20** |
| DSU | 16:51 | 17:03 | 10.2 | **12** |

*DSU Minimum Down-Time Table*

*Minimum Down Time graph*

## Pass Criteria No.5 [CC.7.4 (e)] – Maximum Down Time

Grid Code requirement is to illustrate Maximum Down Time is not less than 2\* (\*or other specific number – to be specified for this report by the DSU) hours.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **IDS/DSU Name** | **Ramp End Time** | **Start of the 1st 15-minute interval** | **Start of the 8th 15-minute interval (\*)** | **Ramp Start Time** | **MW During Down Time** | **MAX Down Time (Mins)** |
| IDS 1 | 10:33 |  |  | 13:02 | 6.3 | **149** |
| IDS 2 | 10.48 |  |  | 13:09 | 3.9 | **141** |
| DSU | 10:48 |  |  | 13:02 | 10.2 | **134** |

(\*or other specific number – to be specified for this report by the DSU as per the test dudation)

*DSU Maximum Down-Time Table*

*Maximum Down Time graph*

## Pass Criteria No.6 [CC.7.4 (f)] – Minimum Off Time

Grid Code requirement is to illustrate Minimum Off Time is not greater than 2 hours.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **IDS/DSU Name** | **Ramp End Time** | **Ramp Start Time** | **MW During Down Time** | **Min Off Time (Hrs)** |
| IDS 1 | 13:14 | 14:30 | 0 | 01:16 |
| IDS 2 | 13:29 | 14:37 | 0 | 01:08 |
| DSU | 13:29 | 14:30 | 0 | 01:01 |

*DSU Minimum Off Time Table*

*Maximum Off Time graph*

## Pass Criteria No.7 [CC.7.4 (g)] – Response Time

Grid Code requirement is to illustrate MW Response Time is not greater than 1 hour.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **IDS Site** | **Issue Time of NCC Dispatch Instruction to Ramp** | **DSU Notice time**  **(minutes)** | **Effective Time of NCC Dispatch Instruction to Ramp** | **Notice Time** | **Ramp Start Time** | **Ramp End Time** | **MW at Ramp Start** | **MW at Ramp End** | **IDS Response Time** |
| IDS 1 | 10:00 |  | 10:22 | 00:22 | 10:22 | 10:34 | 0 | 6.4 | 00:34 |
| IDS 2 | 10:00 |  | 10:22 | 00:29 | 10:29 | 10:49 | 0 | 3.9 | 00:49 |

*IDS Summary Table*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **DSU** | **Issue Time of NCC Dispatch Instruction to Ramp** | **DSU Notice time**  **(minutes)** | **Effective Time of NCC Dispatch Instruction to Ramp** | **Notice Time** | **Ramp Start Time** | **Ramp End Time** | **MW at Ramp Start** | **MW at Ramp End** | **IDS Response Time** |
| DSU Name | 10:00 |  | 10:22 | 00:22 | 10:22 | 10:49 | 0 | 6.4 | **00:49** |

*DSU Summary Table*

*Response Time graph*

## Pass Criteria No.9

Requirement DSU control centre receives all EDIL dispatch instructions from NCC.

## Pass Criteria No.11

Requirement DSU commences implementation of dispatch instruction after the DSU Notice Time.

## Pass Criteria No.12

Requirement DSU responds to the MW instruction no Later than the DSU MW response time.

## Determination of Capacity

Grid Code requirement is to illustrate how the demand reduction capacity of the DSU is being determined. The value is equal to the difference between the demand reduction availability average of 4 quarter hour intervals prior to dispatch instruction being issued and the subsequent minimum of 8 quarter hour averaged Avoided Consumption achieved over the 2\* (\*or other specific number – to be specified for this report by the DSU) hour period of Maximum Down-Time .

**Method of Calculating MW Capacity for each IDS.**

**Scenario:**

NCC issue dispatch instruction at 9am.

DSU ramps up to provide full MW response by 10am.

DSU maintains MW response until 12pm.

**Calculation / Reporting:**

Using SCADA for each site, the DSU calculates the average **demand** for each site for the periods 08:00-08:15, 08:15-08:30, 08:30-08:45, 08:45-09:00. DSU calculates the average of the four values above = "Avg Pre Dispatch Demand"

Using SCADA for each site, the DSU calculates the average **demand** for each site for the periods 10:00-10:15, 10:15-10:30, 10:30-10:45, 10:45-11:00, 11:00-11:15, 11:15-11:30, 11:30-11:45, 11:45-12:00.

For each site: Demand response for 10:00-10:15 = Avg Pre Dispatch Demand - average demand for 10:00-10:15. Demand response for 10:15-10:30 = Avg Pre Dispatch Demand - average demand for 10:15-10:30; etc.

For each site: DSU calculates the minimum of the eight values for demand response during the 2 hour period of Maximum Down Time. This value is the MW Capacity for that IDS.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Average MW 09:00 to 09:15** | **Average MW 09:15 to 0930** | **Average MW 09:30 to 09:45** | **Average MW 09:45 to 10:00** | **Average IDS MW Demand 09:00 to 10:00** |
| 13.03 | 14.89 | 14.14 | 13.86 | **13.98** |

*IDS Demand Summary Table Prior to Dispatch*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Average MW 11:00 to 11:15** | **Average MW 11:15 to 11:30** | **Average MW 11:30 to 11:45** | **Average MW 11:45 to 12:00** | **Average MW 12:00 to 12:15** | **Average MW 12:15 to 12:30** | **Average MW 12:30 to 12:45** | **Average MW 12:45 to 13:00** |
| 3.33 | 4.47 | 4.31 | 3.49 | 3.41 | 4.12 | 3.97 | 3.28 |

*IDS Demand Summary Table During Max Down Time Test*

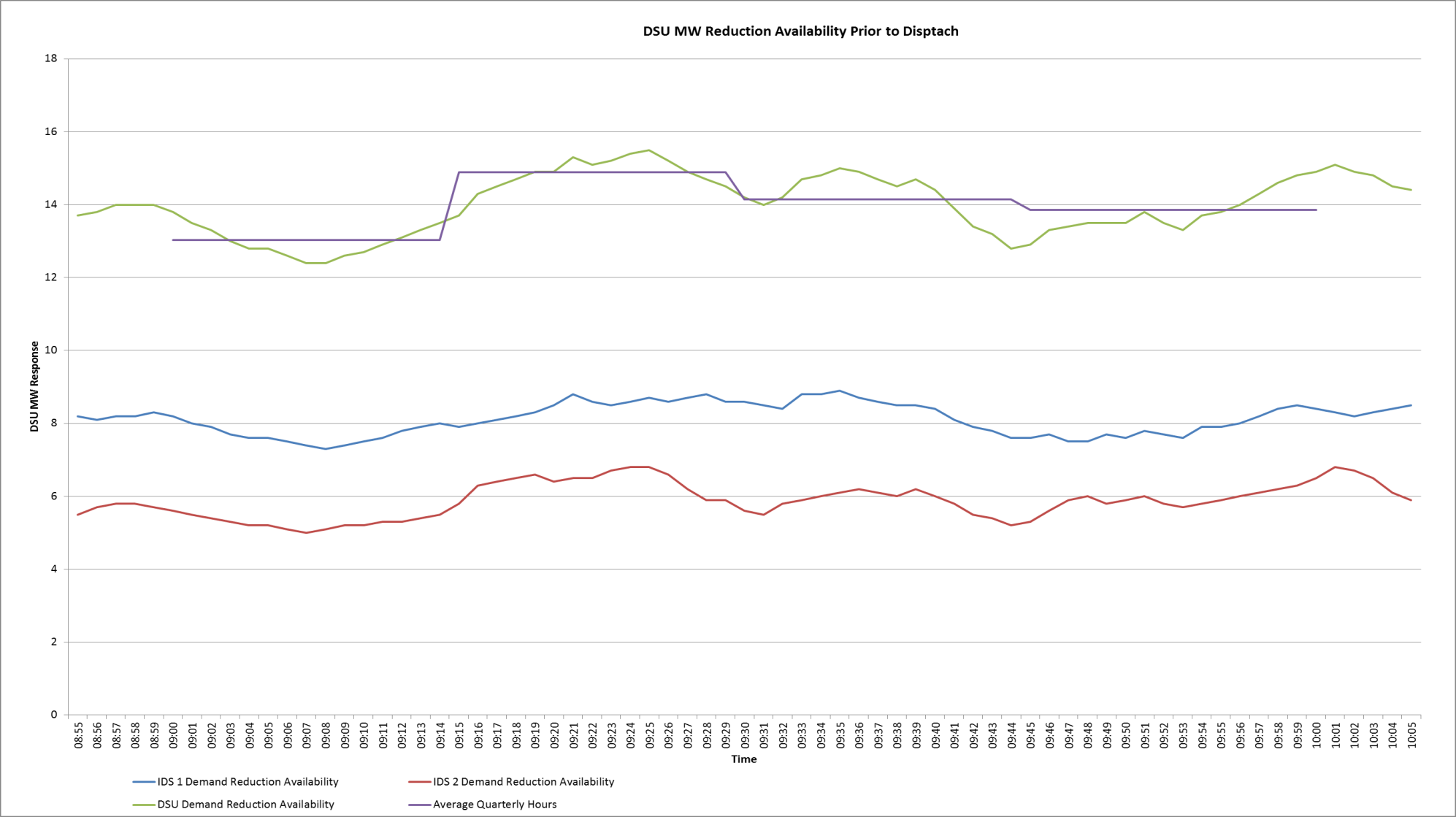
Demand Response in the following table is calculated by subtracting the Site Demand during each quarter hour interval (per the table above) from the “Average IDS MW Demand 09:00 to 10:00”.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Response 11:00 to 11:15** | **Response 11:15 to 11:30** | **Response 11:30 to 11:45** | **Response 11:45 to 12:00** | **Response 12:00 to 12:15** | **Response 12:15 to 12:30** | **Response 12:30 to 12:45** | **Response 12:45 to 13:00** | **Minimum Demand Response 11:00 to 13:00** |
| 10.65 | 9.51 | 9.67 | 10.49 | 10.57 | 9.86 | 10.01 | 10.70 | **9.51** |

*DSU Quarterly Hour Response During Max Down Time Test*

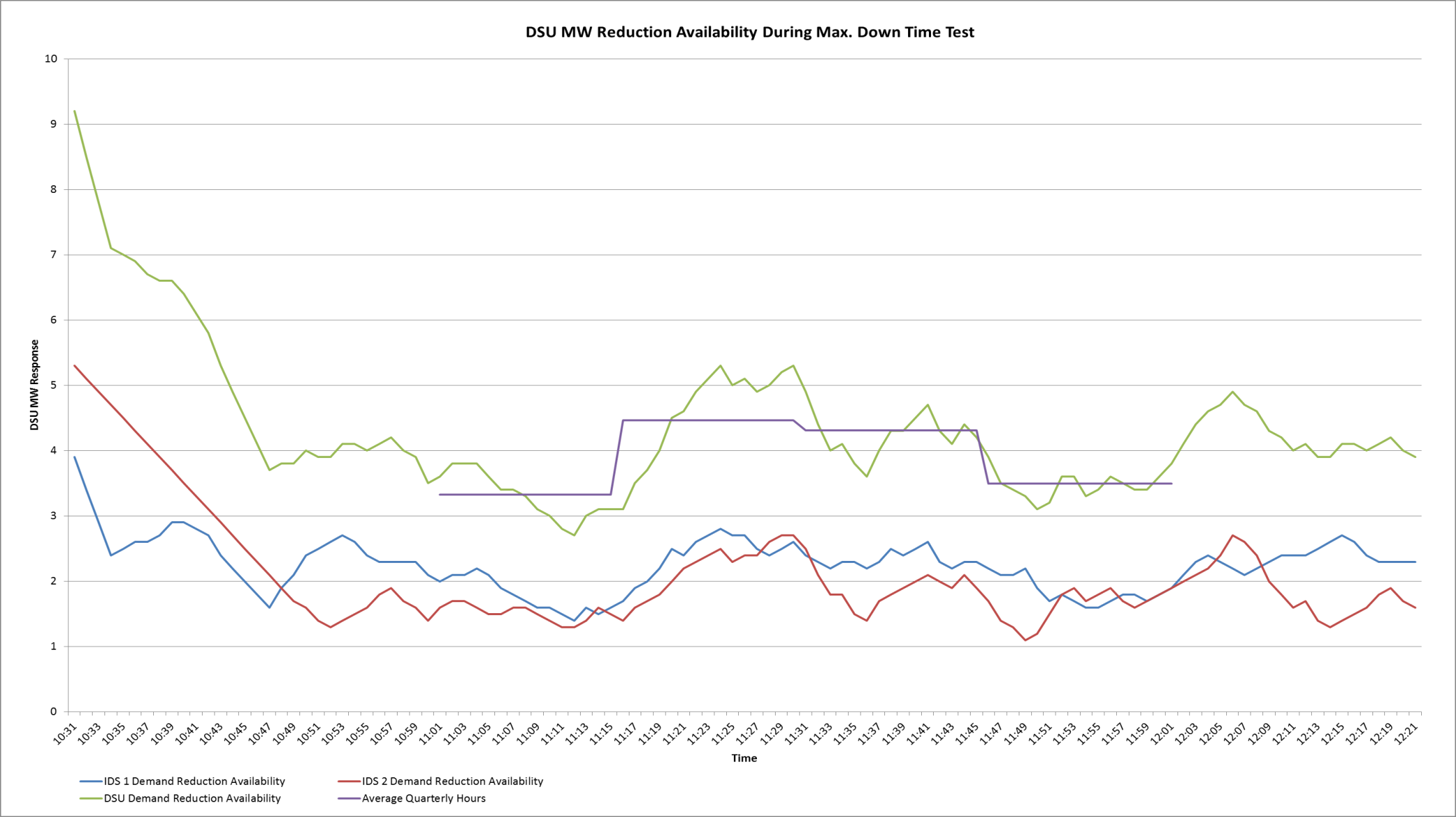
* Demand Reduction capacity of IDS = **9.51 MW**
* Demand Reduction capacity of DSU for aggregate test:

|  |  |  |
| --- | --- | --- |
| **Individual Sites** | **Demand Reduction** | |
| IDS 1 | + | XXX MW |
| IDS 2 | XXX MW |
| IDS 3 | XXX MW |
| **Aggregate Total** | **XXX MW** | |



Average MW value for 4 consecutive 15 minute periods

*Demand Average Quarterly Hour graph*



Average MW value for 8 No. 15 Min periods

*Demand Average Quarterly Hour graph*

1. <http://www.eirgridgroup.com/customer-and-industry/general-customer-information/grid-code-compliance-test/compliance-testing/dsu/> [↑](#footnote-ref-1)
2. <http://www.eirgridgroup.com/customer-and-industry/general-customer-information/grid-code/> [↑](#footnote-ref-2)