

MODIFICATION RECOMMENDATION FORM

MPID 257 – PERFORMANCE MONITORING OF DSU DISPATCH INSTRUCTIONS



RECOMMENDATION TO CER BY EIRGRID OF MODIFICATION TO GRID CODE.

ABSTRACT / TITLE OF MODIFICATION	Performance Monitoring of DSU Dispatch Instructions
MODIFICATION NUMBER	MPID 257
RECOMMENDED AT GCRP MEETING NUMBER	40
LIST OF GRID CODE SECTION(S) AFFECTED BY PROPOSED MODIFICATION:	OC10.4.5.2, OC10.7.5.3, SDC1.4.4.2, SDC1 - Appendix A, Definitions
CURRENT GRID CODE VERSION :	5
MODIFICATION DESCRIPTION Overview THE REASON FOR THE RECOMMENDED MODIFICATION	There is consensus among DSU Operators and prospective DSU Operators that the current method of performance monitoring of DSU Dispatch Instructions in which DSUs must predict within an accuracy of 5% the aggregate demand of all sites comprising a DSU for each half-hour trading period for the following trading day is unworkable and not fit for purpose. The method proposed below generates a baseline profile to which a DSU is monitored against. The baseline is based on the best correlated profiles in the previous twelve weeks.
History of Progression through GCRPs, Working Group and/or Consultation	This modification was discussed at length at nine DSU Joint Grid Code Working Group meetings and was previously brought to GCRP meeting 39. The TSO sought agreement from the industry on the modification but consensus among DSU Operators was not achieved. There was agreement among the members of the working group that all methods proposed during the working group meetings were an improvement on the current method.
Summary Note of any Objections to the Recommended change from GCRP Members or Consultation Responses	<p>One member of the working group was concerned that the method being proposed is open to manipulation. The TSO and other DSUs believe that the opportunity is very limited, the difficulty and level of effort required to manipulate, the reputational damage and the fact that the manipulation is identifiable mean that it does not pose an issue. One member was concerned that the other methods being considered were not suitable for highly variable sites and regular site testing by DSUs could negatively impact baselines and strongly believed that the method being proposed is the best option.</p> <p>Voting on assessment criteria by four DSU Operators found that the method being proposed (Best-Correlated – Including Dispatch) had the highest average rating (un-weighted) across the criteria.</p>

	Criteria	Best-Correlated - Including Dispatch	Best-Correlated - Excluding Dispatch	10 of 10
	Accuracy	3.8	3.0	1.3
	Unbiased	3.5	3.5	3.5
	Not Open to Manipulation	2.5	2.8	3.3
	Clear, Transparent, Understandable and Easily Calculated	2.3	2.5	4.0
	Known in Advance	1.8	2.3	3.8
	Suitable for System with High Number of Dispatches	3.5	2.8	1.0
	Suitable for Sites with High Variance	2.8	2.3	1.0
	It should be noted that the TSOs have committed to reviewing the standard in 2016.			
Outcome of any GCRP Meeting Actions Relating to the Recommended Modification	At GCRP meeting 39 where this modification was first discussed the GCRP Chair requested that the modification be brought back to the DSU Joint Grid Code Working Group for further discussion and analysis. This was completed however consensus among DSU Operators was not achieved.			
Implication of not implementing the Modification	Unable to performance monitor Demand Side Unit Dispatch Instructions			

RED-LINE VERSION

OC10.4.5.2 Compliance of **Demand Side Units** with **Dispatch Instructions**

~~The following validation will be performed in real time:~~

- ~~(i) A **Demand Side Unit** shall be deemed compliant if the **SCADA** signal confirms that the **Demand Side Unit MW Response** is within 5% of the **Dispatch Instruction**.~~

~~The following validation will be performed post event:~~

- ~~(ii) A **Demand Side Unit** shall be deemed to be compliant with the **Dispatch Instruction** if the difference between the **Demand Side Unit Energy Profile** and the metered **Demand** plus the **Demand Side Unit MW Response** is within 5% of the **Demand Side Unit Energy Profile**.~~
- ~~(iii) For **Demand Side Units** which are not **Dispatched** but have been declared **Available** in an **Availability Notice**, the **Demand Side Unit** shall be deemed to be compliant with its declared **Demand Side Unit Energy Profile** if the difference between the **Demand Side Unit Energy Profile** and the metered **Demand** is within 5% of the **Demand Side Unit Energy Profile**.~~

A **Demand Side Unit** shall be deemed compliant with a **Dispatch Instruction** if:

- (i) the **Demand Side Unit MW Response** of the **Dispatch Instruction** is achieved in the **Demand Side Unit MW Response Time** and maintained until the subsequent **Dispatch Instruction** or until the **Maximum Down-Time** of the **Demand Side Unit** has elapsed; and
- (ii) the **Demand Side Unit Performance Monitoring Percentage Error** is less than 5% for each full quarter-hour **Meter** period of the **Demand Side Unit MW Response** for 90% of the last ten **Dispatches** or 90% of the **Dispatches** in a three-hundred and sixty-five day period

or

the **Demand Side Unit Performance Monitoring Error** is less than 0.250 MWh for each full quarter-hour **Meter** period of the **Demand Side Unit MW Response** in 90% of the last ten **Dispatches** or 90% of the **Dispatches** in a three-hundred and sixty-five day period; and

- (iii) the **Demand Side Unit Performance Monitoring Percentage Error** is less than 10% for each full quarter-hour **Meter** period of the **Demand Side Unit MW Response**

or

the **Demand Side Unit Performance Monitoring Error** is less than 0.250 MWh for each full quarter-hour **Meter** period of the **Demand Side Unit MW Response**; and

- (iv) the **Demand Side Unit Performance Monitoring Percentage Error** is on average less than 5% for each full quarter-hour **Meter** period of the **Demand Side Unit MW Response**

or

the **Demand Side Unit Performance Monitoring Error** is on average less than 0.250 MWh for each full quarter-hour **Meter** period of the **Demand Side Unit MW Response**; and

- (v) the **Demand Side Unit SCADA Percentage Error** is less than 5% or the **Demand Side Unit SCADA Error** is less than 0.250 MWh.

OC10.7.5.3 In the event that the performance of a **Demand Side Unit** is deemed by the **TSO** in accordance with the provisions of this OC10 to be in non-compliance with its **Operating Characteristics**, ~~including **Demand Side Unit Energy Profile**~~, or with a **Connection Condition**, then the **TSO** shall notify the **Demand Side Unit Operator** of the non-compliance and the **Demand Side Unit Operator** shall take immediate action to remedy such non compliance. The terms of this OC10.7.5 shall be without prejudice to the rights of the **TSO** to **De-energise** the **Demand Site** and **Apparatus** in accordance with the terms of OC9.6.

SDC1.4.4.2 **Additional Grid Code Characteristics Notice**

The following items are required to be submitted by each **User** direct to the **TSO**:

- (a) Individual **CCGT Unit** data equivalent to the data required for a **CCGT Installation**. It shall also show any revisions to the **Technical Parameters** for each of the **CCGT Units** within it.

[Note: The term “CCGT Module” applies to the SONI Grid Code and the term “CCGT Unit” will apply to the EirGrid Grid Code.]

- (b) Different Fuels: In the case where a **CDGU** is capable of firing on different fuels, then the **Generator** shall submit an **Additional Grid Code Characteristics Notice** in respect of any additional fuel for the **CDGU**, each containing the

information set out in SDC1.4.4.1 above for each fuel and each marked clearly to indicate to which fuel it applies.

- (c) *Export adjustment factors applied by the **User** in submitting data and that may be applied by the **TSO** where applicable in issuing **Dispatch Instructions** and otherwise in calculations relating to instructions in relation to the relevant **Plant** and/or **Apparatus**, between the **Generator Terminals** and the **Connection Points**.*
- (d) In the case of **Interconnector Owners**, **Interconnector** data, including but not limited to the **Availability** of **Interconnector Filters**.
- (e) In relation to each **Demand Side Unit**, the **Demand Side Unit Notice Time Energy Profile** and the **Demand Side Unit MW Response Time**.
- (f) Where there is a **Ancillary Services Agreement** in place, the **Ancillary Services** which are **Available**.
- (g) The parameters listed in Appendix A Part 2 of SDC1.
- (h) *A **Generator** shall submit to the **TSO** the **Operating Reserve** capabilities for each category of **Operating Reserve** defined in OC4.6.3 for each of its **CDGUs** for each **Trading Period**.*

[Note: Please note that the above paragraph only applies to the EirGrid Grid Code only.]

A **User** shall notify the **TSO** as soon as it becomes aware, acting in accordance with **Prudent Utility Practice**, that any of the data submitted under SDC1.4.4.2 changes.

SDC1 - Appendix A

Technical Parameter	CDGU				Control WFPS	DSU		Agg. Gen	CDGU <10MW	Pump Storage Demand
	Thermal	Hydro / En Ltd	Disp. WFPS	Pump S Gen	-	Individual Demand Site	Aggregated Demand Sites		-	-
Demand Side Unit Energy Profile						☐	☐			

Demand Side Unit Energy Profile	The estimated total Energy requirement for an Individual Demand Site or aggregated consumption for each Individual Demand Site which form part of an Aggregated Demand Site for each Trading Period in the following Optimisation Time Horizon period and which must be submitted to the TSO in the Availability Notice under SDC1.4.4.2.
Demand Side Unit MWh Response	The equivalent Energy in a quarter-hour Meter period of a Demand Side Unit MW Response requested in a Dispatch Instruction .
Demand Side Unit Performance Monitoring	An Energy value for each quarter-hour Meter period while a Demand Side Unit is Dispatched . It is the Demand Side Unit Best Correlated Profile excluding the first forty-eight quarter-hour Meter periods.

Baseline	
Demand Side Unit Profile	Consecutive aggregated Meter readings of all Individual Demand Sites that comprise a Demand Side Unit for each of the full quarter-hour Meter periods in a twelve-hour period plus the duration of Dispatch . If the Demand Side Unit was Dispatched during the period the Demand Side Unit Calculated MWh Response in the same quarter-hour Meter periods are added, except in the case of the Dispatch being monitored. In this case the accumulated Energy calculated from Demand Side Unit MW Response from Generation operating in Continuous Parallel Mode or Shaving Mode signal (CC.12.2 (l)) plus the Demand Side Unit MW Response from avoided Demand consumption and Generation operating in Lopping Mode, Standby Mode or Automatic Mains Failure Mode signal (CC.12.2 (m)) are added.
Demand Side Unit Best Correlated Profile	The four Demand Side Unit Profiles from one day to eighty-four days prior to the Dispatch Instruction , offset to minimise the average absolute error across all the Meter periods comprising the Demand Side Unit Profile when compared to the Demand Side Unit Profile which finishes with the Dispatch period, resulting in the four smallest average absolute errors, averaged.
Demand Side Unit Performance Monitoring Error	The absolute value of the Demand Side Unit Calculated MWh Response less the Demand Side Unit MWh Response .
Demand Side Unit Performance Monitoring Percentage Error	The absolute value of the Demand Side Unit Calculated MWh Response less the Demand Side Unit MWh Response divided by the Demand Side Unit MWh Response .
Demand Side Unit SCADA Error	The Demand Side Unit Calculated MWh Response less the accumulated Energy calculated from Demand Side Unit MW Response from Generation operating in Continuous Parallel Mode or Shaving Mode signal (CC.12.2 (l)) plus the Demand Side Unit MW Response from avoided Demand consumption and Generation operating in Lopping Mode, Standby Mode or Automatic Mains Failure Mode signal (CC.12.2 (m)) in the same quarter-hour Meter period.
Demand Side Unit SCADA Percentage Error	The Demand Side Unit Calculated MWh Response less the accumulated Energy calculated from Demand Side Unit MW Response from Generation operating in Continuous Parallel Mode or Shaving Mode signal (CC.12.2 (l)) plus the Demand Side Unit MW Response from avoided Demand consumption and Generation operating in Lopping Mode, Standby Mode or Automatic Mains Failure Mode signal (CC.12.2 (m)) divided by Demand Side Unit Calculated MWh Response the in the same quarter-hour Meter period.
Demand Side Unit Calculated MWh Response	The value of the quarter-hour Demand Side Unit Performance Monitoring Baseline less the sum of the quarter-hour Meter readings of all the Individual Demand Sites that comprise the Demand Side Unit aligned to a quarter-hour Meter period.

GREEN-LINE VERSIONOC10.4.5.2 Compliance of **Demand Side Units** with **Dispatch Instructions**

A **Demand Side Unit** shall be deemed compliant with a **Dispatch Instruction** if:

- (i) the **Demand Side Unit MW Response** of the **Dispatch Instruction** is achieved in the **Demand Side Unit MW Response Time** and maintained until the subsequent **Dispatch Instruction** or until the **Maximum Down-Time** of the **Demand Side Unit** has elapsed; and
- (ii) the **Demand Side Unit Performance Monitoring Percentage Error** is less than 5% for each full quarter-hour **Meter** period of the **Demand Side Unit MW Response** for 90% of the last ten **Dispatches** or 90% of the **Dispatches** in a three-hundred and sixty-five day period

or

the **Demand Side Unit Performance Monitoring Error** is less than 0.250 MWh for each full quarter-hour **Meter** period of the **Demand Side Unit MW Response** in 90% of the last ten **Dispatches** or 90% of the **Dispatches** in a three-hundred and sixty-five day period; and

- (iii) the **Demand Side Unit Performance Monitoring Percentage Error** is less than 10% for each full quarter-hour **Meter** period of the **Demand Side Unit MW Response**

or

the **Demand Side Unit Performance Monitoring Error** is less than 0.250 MWh for each full quarter-hour **Meter** period of the **Demand Side Unit MW Response**; and

- (iv) the **Demand Side Unit Performance Monitoring Percentage Error** is on average less than 5% for each full quarter-hour **Meter** period of the **Demand Side Unit MW Response**

or

the **Demand Side Unit Performance Monitoring Error** is on average less than 0.250 MWh for each full quarter-hour **Meter** period of the **Demand Side Unit MW Response**; and

- (v) the **Demand Side Unit SCADA Percentage Error** is less than 5% or the **Demand Side Unit SCADA Error** is less than 0.250 MWh.

OC10.7.5.3 In the event that the performance of a **Demand Side Unit** is deemed by the **TSO** in accordance with the provisions of this OC10 to be in non-compliance with its **Operating Characteristics** or with a **Connection Condition**, then the **TSO** shall notify the **Demand Side Unit Operator** of the non-compliance and the **Demand Side Unit Operator** shall take immediate action to remedy such non-compliance. The terms of this OC10.7.5 shall be without prejudice to the rights of the **TSO** to **De-energise** the **Demand Site** and **Apparatus** in accordance with the terms of OC9.6.

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- (c) *Export adjustment factors applied by the **User** in submitting data and that may be applied by the **TSO** where applicable in issuing **Dispatch Instructions** and otherwise in calculations relating to instructions in relation to the relevant **Plant** and/or **Apparatus**, between the **Generator Terminals** and the **Connection Points**.*
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- (e) In relation to each **Demand Side Unit**, the **Demand Side Unit Notice Time** and the **Demand Side Unit MW Response Time**.
- (f) Where there is a **Ancillary Services Agreement** in place, the **Ancillary Services** which are **Available**.
- (g) The parameters listed in Appendix A Part 2 of SDC1.
- (h) *A **Generator** shall submit to the **TSO** the **Operating Reserve** capabilities for each category of **Operating Reserve** defined in OC4.6.3 for each of its **CDGUs** for each **Trading Period**.*

[Note: Please note that the above paragraph only applies to the EirGrid Grid Code only.]

A **User** shall notify the **TSO** as soon as it becomes aware, acting in accordance with **Prudent Utility Practice**, that any of the data submitted under SDC1.4.4.2 changes.

SDC1 - Appendix A

Demand Side Unit MWh Response	The equivalent Energy in a quarter-hour Meter period of a Demand Side Unit MW Response requested in a Dispatch Instruction .
Demand Side Unit Performance Monitoring Baseline	An Energy value for each quarter-hour Meter period while a Demand Side Unit is Dispatched . It is the Demand Side Unit Best Correlated Profile excluding the first forty-eight quarter-hour Meter periods.
Demand Side Unit Profile	Consecutive aggregated Meter readings of all Individual Demand Sites that comprise a Demand Side Unit for each of the full quarter-hour Meter periods in a twelve-hour period plus the duration of Dispatch . If the Demand Side Unit was Dispatched during the period the Demand Side Unit Calculated MWh Response in the same quarter-hour Meter periods are added, except in the

	<p>case of the Dispatch being monitored. In this case the accumulated Energy calculated from Demand Side Unit MW Response from Generation operating in Continuous Parallel Mode or Shaving Mode signal (CC.12.2 (l)) plus the Demand Side Unit MW Response from avoided Demand consumption and Generation operating in Lopping Mode, Standby Mode or Automatic Mains Failure Mode signal (CC.12.2 (m)) are added.</p>
Demand Side Unit Best Correlated Profile	<p>The four Demand Side Unit Profiles from one day to eighty-four days prior to the Dispatch Instruction, offset to minimise the average absolute error across all the Meter periods comprising the Demand Side Unit Profile when compared to the Demand Side Unit Profile which finishes with the Dispatch period, resulting in the four smallest average absolute errors, averaged.</p>
Demand Side Unit Performance Monitoring Error	<p>The absolute value of the Demand Side Unit Calculated MWh Response less the Demand Side Unit MWh Response.</p>
Demand Side Unit Performance Monitoring Percentage Error	<p>The absolute value of the Demand Side Unit Calculated MWh Response less the Demand Side Unit MWh Response divided by the Demand Side Unit MWh Response.</p>
Demand Side Unit SCADA Error	<p>The Demand Side Unit Calculated MWh Response less the accumulated Energy calculated from Demand Side Unit MW Response from Generation operating in Continuous Parallel Mode or Shaving Mode signal (CC.12.2 (l)) plus the Demand Side Unit MW Response from avoided Demand consumption and Generation operating in Lopping Mode, Standby Mode or Automatic Mains Failure Mode signal (CC.12.2 (m)) in the same quarter-hour Meter period.</p>
Demand Side Unit SCADA Percentage Error	<p>The Demand Side Unit Calculated MWh Response less the accumulated Energy calculated from Demand Side Unit MW Response from Generation operating in Continuous Parallel Mode or Shaving Mode signal (CC.12.2 (l)) plus the Demand Side Unit MW Response from avoided Demand consumption and Generation operating in Lopping Mode, Standby Mode or Automatic Mains Failure Mode signal (CC.12.2 (m)) divided by Demand Side Unit Calculated MWh Response the in the same quarter-hour Meter period.</p>
Demand Side Unit Calculated MWh Response	<p>The value of the quarter-hour Demand Side Unit Performance Monitoring Baseline less the sum of the quarter-hour Meter readings of all the Individual Demand Sites that comprise the Demand Side Unit aligned to a quarter-hour Meter period.</p>