SO_OP_3705 Dispatch Procedure Consultation

Final Information Paper

Published: September 2022

Executive Summary

The publication of this Final Information Paper completes AEMO's consultation (Consultation) on the proposed changes to the SO_OP_3705 Dispatch Procedure (Procedure) to implement the relevant aggregated dispatch conformance arrangements (ADC) in accordance with clause 11.145.16 of the National Electricity Rules (NER), under the National Electricity Amendment (Integrating energy storage systems into the NEM) Rule 2021 No. 13 (IESS Rule).

AEMO published the Initial Information Paper to facilitate feedback from stakeholders on the most efficient way to meet the objectives for implementing the changes in the Procedure.

AEMO received four submissions in response.

Contents

1. Stakeholder Consultation Process

As indicated in the Initial Information Paper[1], AEMO has established a comprehensive stakeholder engagement program to ensure the effectiveness of the Consultation.

AEMO's timeline for the Consultation is shown below:

Deliverable	Date
Targeted one-to-one pre-consultations to inform options for ADC	May – June 2022
Initial Information Paper published	21 July 2022
Stakeholder information session	26 July 2022
Engagement through the IESS-WG	27 July 2022
Submissions due on Initial Information Paper	12 August 2022
Final Information Paper and Procedure published	14 September 2022

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[1] AEMO Dispatch Procedure – Information Paper: https://www.aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2022/dispatch-procedure-consultation/dispatch-procedure-information-paper.pdf?la=en

2. Background

2.1. IESS Rule

On 2 December 2021, the Australian Energy Market Commission (AEMC) made its Final Determination on the IESS Rule, to integrate storage and hybrid systems into the National Electricity Market (NEM). Under the IESS Rule, there will be significant changes to registration and dispatch arrangements, as well as in areas such as non-energy cost recovery, performance standards, and participation options for aggregation of small resources, including batteries.

2.2. Context for this consultation

The Procedure is a *power system operating procedure* made in accordance with NER 4.10.1.

The Procedure provides instructions and guidelines in respect of the operation of the power system, including the requirements on Registered Participants to respond to dispatch instructions.

Under NER clause 11.145.16(d), by 31 March 2023, AEMO must make the Procedure as a *power system operating procedure*, setting out:

(1) permitted forms of ADC by one or more *scheduled resources* comprised in a *generating system*; and

(2) arrangements for AEMO to specify when resource level compliance (RLC) is required.

AEMO was not required to formally undertake the Consultation on the Procedure. However, AEMO considers that the Changes are material. In particular, AEMO sought feedback on the Changes to allow ADC for two or more dispatchable unit identifiers (DUIDs) behind a connection point (or individual DUID dispatch conformance, if required by AEMO), with conformance information issued in dispatch instructions.

Prior to 3 June 2024, AEMO envisages further changes to this Procedure, to incorporate the dispatch arrangements in respect of the new bidirectional unit (BDU) model.

On 3 June 2024, the ADC arrangements under NER 4.9.2A will commence operation.

2.3. Consultation feedback and responses

On 21 July 2022, AEMO published the Initial Information Paper and change-marked draft Procedure, inviting feedback on the changes to the Procedure to implement ADC.

AEMO received four submissions in response to the Initial Information Paper.

A summary of the stakeholder feedback and AEMO's response is included in Appendix A of this report.

3. Final changes

In response to the submissions, and to improve clarity of the ADC arrangements, AEMO has made the following additional changes to the Procedure:

- Added to the Glossary definition for "Aggregate, Aggregate System", that these terms are also referred to as an "Aggregate Dispatch Group" in AEMO's market systems.

- Added to the Glossary a term "Aggregate Actual MW" which is referred to in Appendix A.

- Changed the Glossary definition of "Aggregate Dispatch Target", to clarify that it is equal to the sum of Dispatch Targets for all *scheduled generating units* and *semi-scheduled generating units* in an Aggregate, minus the sum of Dispatch Targets for all *scheduled loads* in an Aggregate.

- Changed the name "Conformance Flag" to "Conformance Mode", to reflect the fact that mode has multiple states, whereas flag is binary.

- Deleted the Glossary term "Hybrid system", given it is not used in the Procedure.

- Added Section 2.6(c), to clarify that AEMO determines whether the Aggregate is a Cap Aggregate or a Target Aggregate, in accordance with Section 2.6.1(a) or 2.6.2(a) respectively.

- Added Section 2.6(e), to clarify that AEMO will automatically register as a Target Aggregate a *generating system* that only comprises one or more batteries modelled as *scheduled generating unit/scheduled load* pairs for the purpose of dispatch conformance monitoring.

- Clarified Section 2.6.2(a), to the effect that an Aggregate may also include one or more *scheduled loads* that is not part of a battery.

- Clarified Section 3.3, to the effect that the non-conformance of *scheduled loads* that are part of an Aggregate (including battery-only *generating systems* that are *scheduled generating unit/scheduled load* pairs) are automatically processed by the AEMO Conformance Module.

- Updated Appendix A.1, to clarify that scheduled network services are not monitored in AEMO's Conformance Monitoring software (CompMon).

- Updated Appendix A.1 and A.2, to distinguish between generating units and loads in the calculation of individual and aggregate dispatch errors and error trigger thresholds. Also clarified the logic for incrementing and resetting error counts.

- Updated Appendix A.5 worked example for a Target Aggregate, to reflect the changes to calculation of aggregate dispatch errors and aggregate error trigger thresholds. Added worked examples for a Cap Aggregate and Target Aggregate with both aggregated and individual conformance requirements.

4.   Summary of Issues

The issues arising from the submissions are summarised in Table 1 of Appendix A.

5.   Conclusion

Having considered the matters raised in submissions and at meetings/forums, AEMO has amended the Procedure as published with this Final Information Paper.

Appendix A.   Summary of Submissions and AEMO Responses

No.	Issue	Consulted person	Stakeholder comment	AEMO response
1.	The High-Level Design presents three options for the classification of DC coupled systems as detailed in the following sections:	Total Eren	**Scheduled bidirectional unit:** We understand this option is designed to cater for a solar farm and Battery Energy Storage System (BESS) intending to always operate as a fully dispatchable facility. This option would not be the first choice for our facilities as it limits flexibility as described below. Under this classification option, the scheduled bidirectional unit would need to continually adjust the output from the BESS to meet its dispatch target. This would increase battery cycling but more importantly it would mean that every time a cloud passes over the solar farm during a 5-minute dispatch interval, the BESS would be forced to discharge to achieve the combined target. By discharging the BESS during the day when clouds pass by, it will decrease the amount of energy available for dispatch during energy peaks outside of solar generation periods. Dispatching the BESS during the day instead of dispatching during the evening peak when the spot price is typically higher would have a large negative impact on project revenue. However, there is also a serious negative impact to power system operation by having less storage available during the evening peak.	For a Target Aggregate, AEMO concedes that the ongoing requirement for a BESS to firm the intermittent generator output could potentially reduce the storage available for the evening peak. However, we consider that over-target and under-target deviations of the intermittent generator might somewhat balance out over the day, and that a sustained under-target bias (that would result in a sustained BESS discharge) is relatively unlikely. On the other hand, greater cycling of the BESS storage could occur to meet the ongoing firming requirement. The corollary to this is a BESS that is providing FCAS regulation raise and lower response. For a Cap Aggregate, aggregated dispatch conformance is only monitored for over-target error. Cap Aggregate treatment would be inappropriate for a semi-scheduled solar/scheduled BESS aggregate, particularly overnight when only the scheduled BESS is available but is not being monitored for under-target error – thus incorrectly treating the scheduled BESS like a semi-scheduled generating unit. The NER only allows semi-scheduled generating units to conform to a cap. AEMO has previously considered the option of allowing a participant to dynamically switch between aggregated and individual dispatch conformance from one trading interval to another. However, this option was ruled out due to the greater system complexity, higher implementation costs and inability to meet the March 2023 deadline for implementation of aggregated dispatch conformance.
2.		Total Eren	**Semi-scheduled generating unit:** This option precludes charging from the grid. Demand is often very low overnight and prices are often negative, particularly in Victoria where one of our developments is located. Therefore, this limitation would have a severe impact on the project's revenue. Encouraging charging overnight would help mitigate issues with minimum demand, and therefore from a power system operations	Refer to AEMO''s response above. AEMO would be unlikely to allow this classification if the BESS nameplate rating is ≥ 5MW, in which case the BESS would be a scheduled BDU.

No.	Issue	Consulted person	Stakeholder comment	AEMO response
			perspective, this option falls short of fully utilising the capability of the installed technology.	
3.		Total Eren	**Scheduled bidirectional unit and semi-scheduled generating unit:**	Refer to AEMO's response above.
			From the draft High-Level Design, we believed this option would align with the way we wanted to operate our DC coupled facilities. However, with the introduction of the Aggregated Dispatch Conformance (ADC), specifically, the Target Aggregate approach, this implementation fails to provide flexibility we expected under this classification. The Target Aggregation would force firming from the BESS and is effectively no different from the scheduled generating unit classification in this respect. We believe we should have the option to firm the solar output by using the BESS, but not be forced to firm.	
			Opting out of the ADC would be a more detrimental outcome, as we would not be able to store excess solar into our BESS.	
			For a DC coupled BESS and solar facility, the Cap Aggregate option is not an available option. Fortunately, we believe there is an easy fix. Making a slight adjustment to the High-Level Design to allow Cap Aggregation for a DC coupled facility would resolve this issue as the BESS would not be forced to dispatch its stored energy at inopportune times and could store its output for dispatch during the evening peak.	
4.	AGC	Neoen	Regarding AGC, will generating systems receive an aggregate AGC signal for an aggregate system, or separate AGC signals for each unit within the aggregate system?	The generating system will receive a single aggregate AGC setpoint covering all units in the aggregate.

No.	Issue	Consulted person	Stakeholder comment	AEMO response
5.		Neoen	If some of the generating units in an aggregate system are registered for RFCAS, but others not, is this managed using separate targets or a combined target? If a combined target, how is the target for each generating unit decided?	The generating system will receive a single aggregate AGC setpoint every 4 seconds based on the linear ramp of the combined energy target plus any regulation requirement. Participants will be required to implement a control system to disaggregate the single AGC setpoint into individual unit setpoints based on the requirements for aggregated/individual dispatch conformance and FCAS enablement/delivery as defined in the Dispatch procedure. Note that individual unit targets are available via EMMS (Electricity Market Management System).
6.	Procedure section 2.6(a)	Neoen	1. Are there any exemptions for this? For example, if we have two generating units behind one connection point, who will make the decision which those units must be in one aggregate system? 2. Could the Generator choose to have these generating units separately instead of in one aggregate system during Registration? 3. Which should take priority over the other: RLC or ADC? For example, at Neoen's Bulgana GPH, RLCs are assessed for the wind farm and BESS separately, while ADCs for the combined WF+BESS	1. Participant can choose whether to opt into aggregated dispatch conformance, and what DUIDs behind the connection point are included 2. Yes 3. RLC (resource level compliance), if required, takes priority over ADC (aggregated dispatch conformance)
7.	Procedure section 2.6(b)	Neoen	Who will decide if the system is categorised as a cap aggregate or a target aggregate? Does AEMO decide according to the definition, or may participants decide based on the application submitted?	AEMO decides according to the definition of Cap Aggregate and Target Aggregate and the classification of the units in the Aggregate System proposed by the participant. AEMO has clarified this under section 2.6(c) of the Dispatch procedure: (c) AEMO determines whether the Aggregate is a Cap Aggregate or a Target Aggregate, in accordance with section 2.6.1(a) or 2.6.2(a) respectively.
8.	Review of constraints	Neoen	Regarding constraint equations, can DUIDs which are not part of one aggregate system be aggregated into one constraint equation?	Yes

No.	Issue	Consulted person	Stakeholder comment	AEMO response
9.	Definition of a Hybrid	Sun Metals	SMC Notes that Hybrid Systems were discussed at length in the recent IRP Rule change issued by the AEMC, however no steps were taken to add a definition to the NER. Consequently, the rule change, and the following IESS High Level Design documentation discuss impacts of the IRP registration changes on Hybrid Systems, without having a thorough and consistent definition to work with.	AEMO has removed the term "Hybrid System" from the Dispatch Procedure glossary, given the Dispatch Procedure does not refer to this term and instead refers to the broader term "Aggregate" or "Aggregate System".
			SMC does not agree with the definition proposed in the Dispatch Procedure, as this suggests that all Hybrid Systems have units that "Produce" electricity for the purpose of providing services to the NEM. This is not the case.	
			In the submission made by SMC to the IRP rule change consultation paper, SMC went to great lengths to describe the alternative types of Hybrid Systems that currently exist in the NEM that do not produce energy, nor are they resources for the NEM. Hybrid System in SMC's view, which was accommodated by the AEMC rule change, also include industrial loads supported by generation or storage. Many large and medium sized end-users, like SMC, install generation on-site, and behind the meter, to manage electricity costs and reduce greenhouse gas emissions. Sometimes batteries are added to assist in the management of the market price and load profiles.	
			The Hybrid System definition should be sufficiently broad to include Hybrid generators, and hybrid loads/generation, especially where the site is primarily a load site for consumer purposes and the generation or storage is primarily for efficient energy cost management behind the meter at the connection point. Market participants with large industrial loads, with co-located behind the meter semi-scheduled generation plus batteries to support on-site energy consumption, in other words an IRP (Hybrid System) as defined in the new rules, should be encouraged if the Hybrid	

No.	Issue	Consulted person	Stakeholder comment	AEMO response
			System facilitates more economically efficient electricity supply.	
			SMC suggests that the administrative rule change proposed by AEMO as part of the IESS HLD Implementation could be used to facilitate the addition of the definition for Hybrid System to the rules, in order to satisfy this inconsistency.	
10.	Aggregate Dispatch Conformance	Sun Metals	SMC does not understand AEMO's reasoning for not allowing scheduled loads to utilise the Cap Aggregate conformance method. From the definitions listed in the dispatch procedure, the dispatch target includes scheduled loads, however scheduled loads (non-BESS) appear to be excluded from both aggregate methods. SMC agrees that semi-scheduled generators are more appropriate in the cap aggregate method as they are not able to totally control generation output, as they are inherently variable by nature.	AEMO has clarified the definition of an Aggregate System that is a Target Aggregate under section 2.6.2(a) of the Dispatch procedure, to include scheduled loads:
			Large industrial energy users that are scheduled loads may not have sufficient flexibility to meet a target dispatch position, even with behind the meter generation and battery storage. It is more likely that working to a dispatch Cap would be more feasible for such inflexible loads, with semi scheduled generating units and a battery behind the point of connection. This classification would allow for the customer to maximise semi scheduled generation plus storage while balancing its load requirements at the connection point to the NEM, without having to constantly work towards a target dispatch level that may not suit the loads needed for the industrial process.	(a) A Target Aggregate is an Aggregate that includes one or more *scheduled generating units* (for example, a battery *scheduled generating unit/scheduled load* pair plus a solar *semi-scheduled generating unit*) **and may also include one or more *scheduled loads* that is not part of a battery.**
				AEMO does not agree that a Cap Aggregate should apply when a scheduled unit (including a scheduled load) is part of an Aggregate System, because this would allow the scheduled unit to conform as a cap rather than a target, which is only permitted for semi-scheduled generating units under the NER.
11.	General	Origin Energy	Origin Energy has reviewed the following documents and we have no feedback • IESS HLD – Final • IESS Strawperson – Draft • SO_OP_3705 Dispatch Procedure	AEMO notes the respondent's comment