

Stakeholder information session

Aggregated Dispatch Conformance

IESS Project

30 November 2022

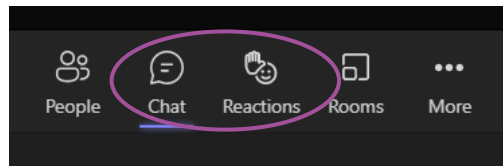


We acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture.

We pay respect to their Elders past, present and emerging.

Introductions

- The purpose of this session is to share the arrangements for Aggregated Dispatch Conformance under the IESS rule implementation, and seek stakeholder feedback on the items outlined in the information paper published on Tuesday, 29 November 2022
- This forum does not replace the formal written submissions process – we encourage all stakeholders to provide written feedback to IESS@aemo.com.au by Friday 20 January 2023
- To support discussion during this forum, we ask all attendees to please raise their virtual hand when they intend to speak or post questions in the Teams chat and be respectful to others speaking. There will be breaks to verbally answer questions throughout the presentation as well as at the end



- Please introduce yourself (name & organisation) before you speak.

AEMO Competition Law - Meeting Protocol

AEMO is committed to complying with all applicable laws, including the Competition and Consumer Act 2010 (CCA). In any dealings with AEMO, all participants agree to adhere to the CCA at all times and to comply with appropriate protocols where required to do so.

AEMO has developed meeting protocols to support compliance with the CCA in working groups and other forums with energy stakeholders. Before attending, participants should confirm the application of the appropriate meeting protocol.

Please visit: <https://aemo.com.au/en/consultations/industry-forums-and-working-groups>

AGENDA

#	TIMING (ADST)	TOPIC	PRESENTER
1	11:00 – 11:05	Welcome	Ulrika Lindholm, AEMO
2	11:05 – 11:10	Purpose, objectives and context	Emily Brodie, AEMO
3	11:10 – 11:20	Original approach to ADC	Basilisa Choi, AEMO
4	11:20 – 11:40	Proposed alternative ADC	Basilisa Choi, AEMO
5	11:40 – 11:55	Q&A	All
6	11:55 – 12:00	Next steps	Emily Brodie, AEMO
7	12:00	Thanks and close	Ulrika Lindholm, AEMO

2. Purpose, objectives and context

Emily Brodie



Session purpose and objective

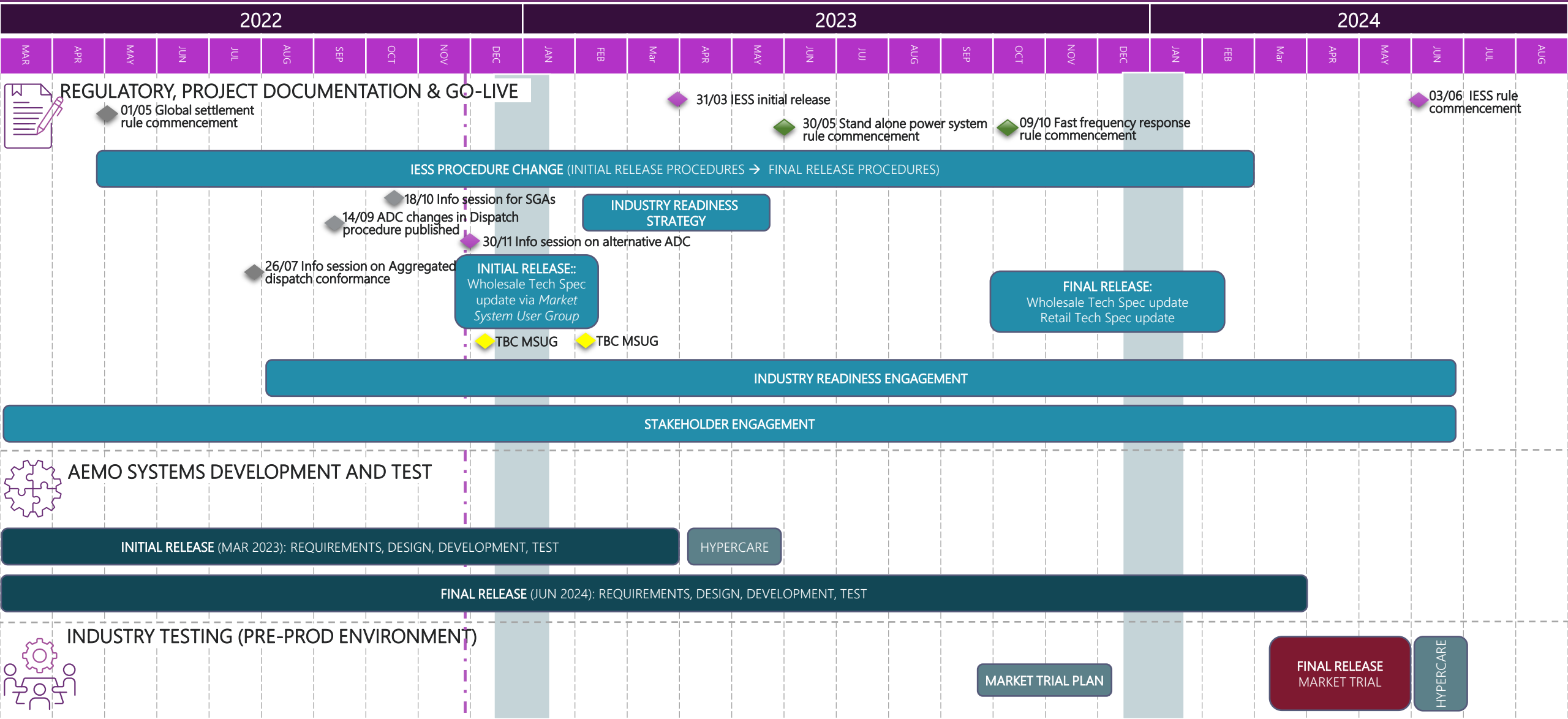
PURPOSE

- A session for stakeholders to explore the proposed 'alternative' ADC

OBJECTIVE/S

- Explain context for re-consulting on ADC
- Discuss features of proposed 'alternative' ADC
- Confirm consultation timeline and next steps.

IESS – Indicative Industry Timeline



- IESS Confirmed
- IESS Indicative
- Concurrent initiatives
- Completed activities
- Summer holiday periods: Avoid industry IESS activities where possible
- Timing, duration and coverage of market trial TBC

Context for ADC delivery change

- A stakeholder proposed an alternative aggregated dispatch conformance (ADC) solution some time after the first ADC consultation had been completed.
- AEMO has assessed the proposal as being feasible to implement and a better solution that will result in more participants using ADC.
- AEMO believes it appropriate to implement the alternative ADC design as soon as possible, but this will be later than the NER effective date (31 March 2023).
- **Implications:**
 - Stakeholders (including NEM2025 forums) will be updated on the implementation timeline as information becomes available
 - AER/AEMC have been informed
 - Dispatch procedure requires re-consultation.

3. Original approach to ADC

Basilisa Choi



Original ADC approach: Registration for ADC

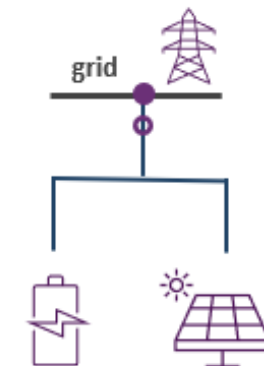
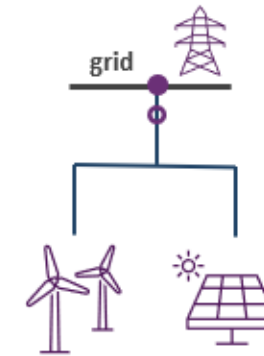
- Participant can apply to AEMO to opt into ADC for nominated DUIDs as part of registration (NOT dynamically)
- AEMO determines whether that Aggregate System is a Cap Aggregate or Target Aggregate

Cap Aggregate

- Generating system behind a connection point with semi-scheduled generating units only

Target Aggregate

- Generating system behind a connection point with one or more scheduled generating units (which includes a scheduled battery gen/load) and may include other schedule loads



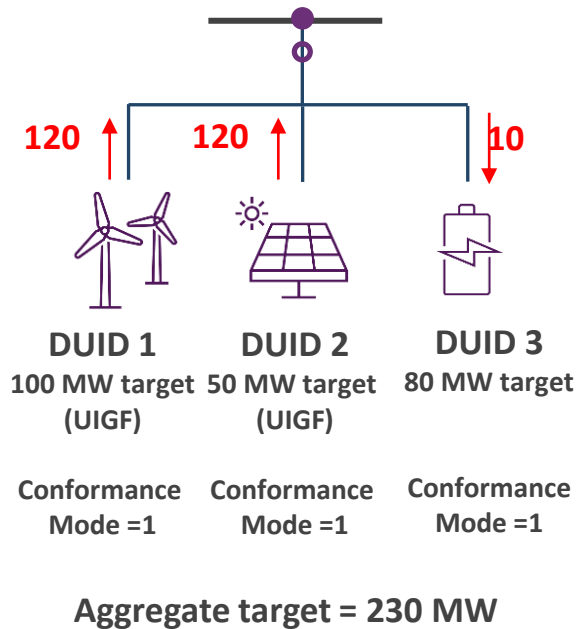
Original ADC approach: ADC approach for Target Aggregate

- By default, aggregate dispatch conformance (CM=1)
 - Single AGC set-point for the aggregate
- Aggregate dispatch non-conformance occurs if:

Absolute(Aggregate dispatch error) > aggregate threshold

- If AEMO requires individual dispatch conformance for a unit within the aggregate (CM=2), unit dispatch error is determined based on its classification:
 - Semi-scheduled: $\text{Actual} - \text{Target} > \text{Threshold}$ (cap exceedance only)
 - Scheduled: $\text{ABS}(\text{Actual} - \text{Target}) > \text{Threshold}$

Original ADC approach: Conformance for a Target Aggregate



DUID CM	How is DUID CM set?	Dispatch Conformance Requirement
1	If this DUID is not in a binding individual constraint	<p>DUIDs must meet their aggregate target at all times</p> <ul style="list-style-type: none"> Aggregate target is firm, and can be delivered from any combination of DUID outcomes In the example, must meet the aggregate target of 230 MW
2	If this DUID is in a binding individual constraint	<p>DUIDs must meet their individual target</p> <ul style="list-style-type: none"> Semi scheduled generating unit may underperform its individual target as dictated by energy resource availability (as now)

Feedback on first ADC Dispatch procedure consultation

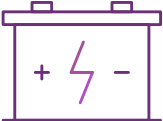
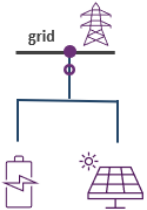
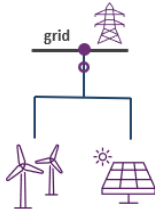
- Participants are interested in ADC. However, they did not want to be forced to firm VRE under-delivery from BESS as part of being a Target Aggregate
- Participants want the ability to opt in and out of ADC in near real-time to achieve the above. AEMO was unable to deliver this by March 2023 owing to its complexity.
- After the consultation, a stakeholder proposed an alternative ADC solution for opting in and out of ADC
- AEMO has assessed the proposal as being feasible to implement and a better solution that will result in more participants using ADC
- The following slides explain the proposed alternative ADC design, which is currently being consulted on.

4. Proposed alternative ADC

Basilisa Choi



Proposed aggregate types

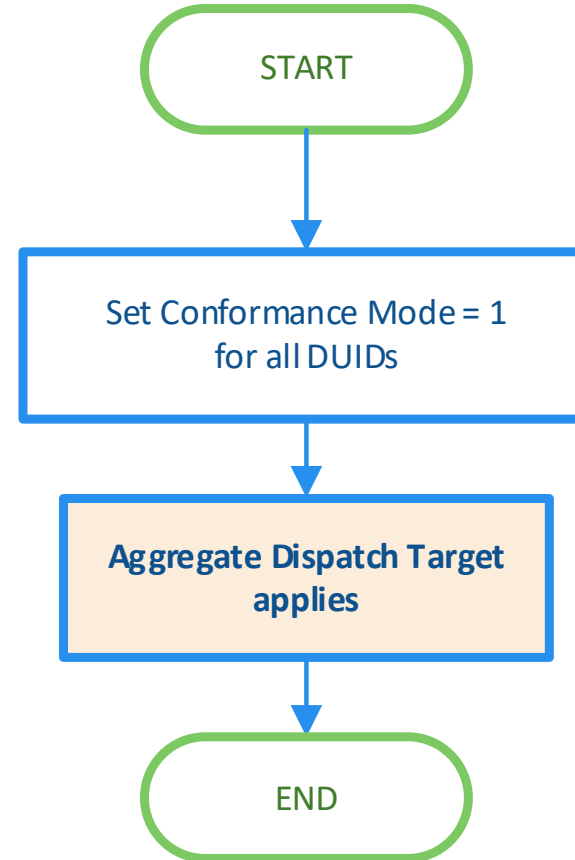
Aggregate type	Description	Example
Target	Battery only: Scheduled generating unit/scheduled load pair <i>Transitional arrangement until 03 Jun 24.</i>	One battery (scheduled) 
Mixed	Comprises scheduled generating units and which may also include semi-scheduled generating units or scheduled loads. Excludes battery-only aggregate	Battery (scheduled) and solar generating unit (semi-scheduled). 
Cap	Only comprises semi-scheduled generating units.	Generating system comprising wind and solar generating units (both semi-scheduled). 

Target aggregate (transitional)

- Target aggregate = Battery only
 - A scheduled generating unit/scheduled load pair
 - single AGC set-point for the aggregate
- Batteries will be deemed ‘target aggregates’ until they transition from being a scheduled generator/load pair to a bi-directional unit (BDU) on and from 03 June 2024.
- By treating batteries as aggregates in AEMO’s conformance monitoring system,
 - AEMO’s system can better monitor and reflect the true status of the units in managing the power system; and
 - the units will not be inadvertently flagged as non-conforming
- There is no registration action for participants who have a battery.
 - AEMO will make the change
- Participants will receive a Conformance Mode = 1 in their dispatch instruction
- Participants will need to monitor the conformance status in the dispatch non-conformance report for the ADG ID

Alternative ADC for a Target Aggregate

Setting the
Conformance Mode



Issues for feedback

INFO PAPER REFERENCE	TOPIC	ISSUE FOR FEEDBACK
Question 1	Types of dispatch conformance logic	Are there any scenarios where the Target Aggregate arrangement should be retained after the IESS Final Release (03 June 2024)?

Alternative ADC for a Mixed Aggregate

In any trading interval, an aggregate facility is considered to be conforming with its dispatch instructions if its units are EITHER conforming individually OR conforming in aggregate.

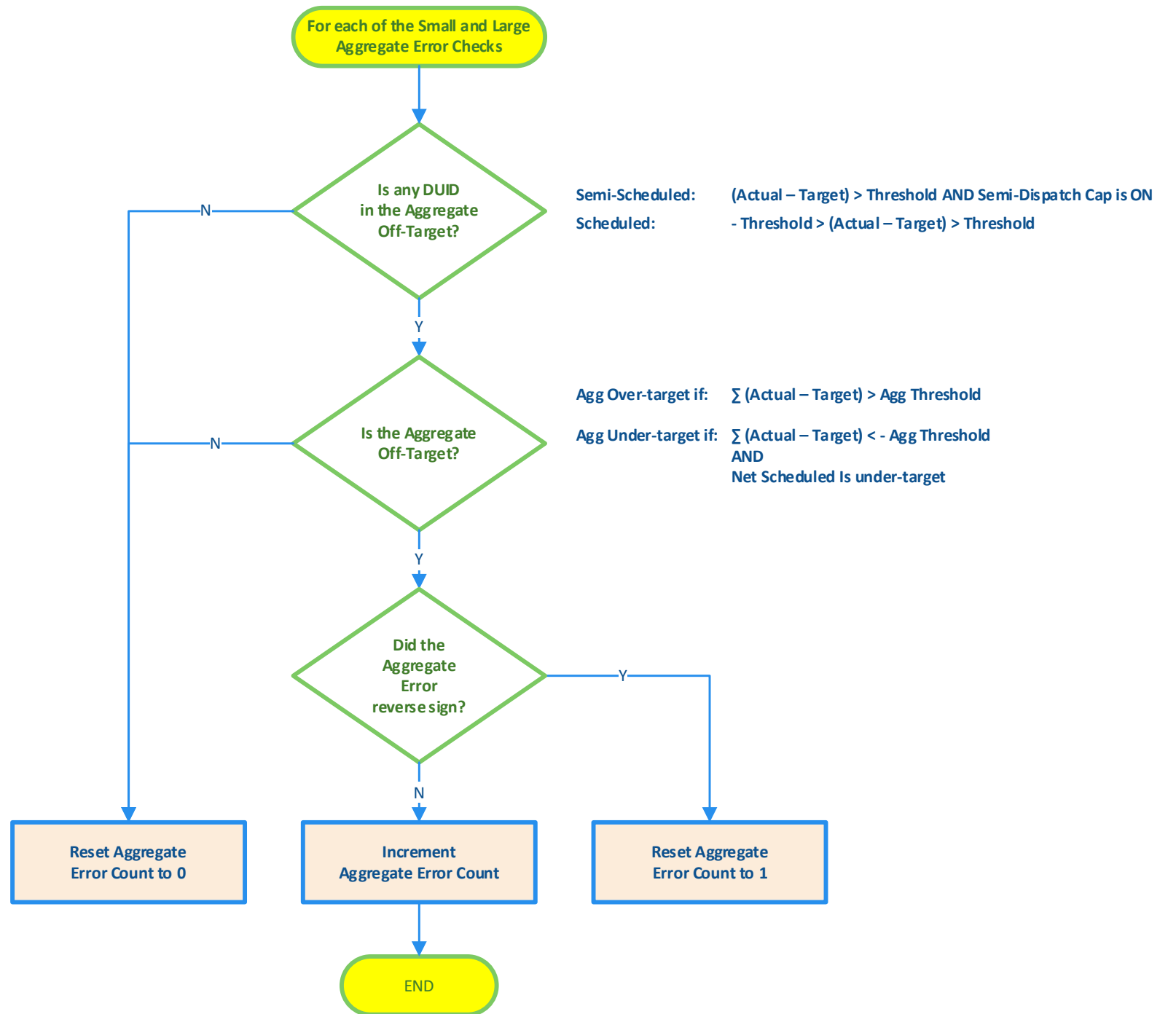
- Register for ADC
- Participant can choose in real-time to conform in aggregate or individually for units that are not subject to RLC (aka dynamic ADC)
 - No single AGC set-point for the aggregate (by default)
- Deemed as “participating in ADC” if any unit not subject to RLC is “off-target”:
 - **Any scheduled units, or any semi-scheduled units with SDC on, are over-target**
 - participant is indicating their intention for those units to offset the under-target of other units (e.g. firming the semi-scheduled shortfall)
 - **OR**
 - **Any scheduled units are under-target**
 - participant is indicating their intention for those units to be offset from the over-target of other units (eg charge conservation or additional charging from the semi-scheduled excess)
- AEMO proposes to report that the aggregate is participating in ADC via Dispatch Conformance Report
- This alternative is different to the original approach, which always requires participation in ADC, and effectively forces a scheduled unit (e.g. BESS) to go above its target to fully firm a semi-scheduled unit that is below its target due to a drop in its available energy source

Alternative ADC for Mixed Aggregate

- **Aggregate over-target error → non-conforming:**
 - For example, the scheduled BESS is not permitted to go over-target more than the semi-scheduled solar is under-target due to cloud cover (the firming limit) otherwise the aggregate system would export the excess to the grid
- **Aggregate under-target → non-conforming:**
 - For example, the scheduled BESS is not permitted to go under-target more than the semi-scheduled solar is over-target due to its under forecast (the charging limit) otherwise the aggregate system would import the shortfall from the grid

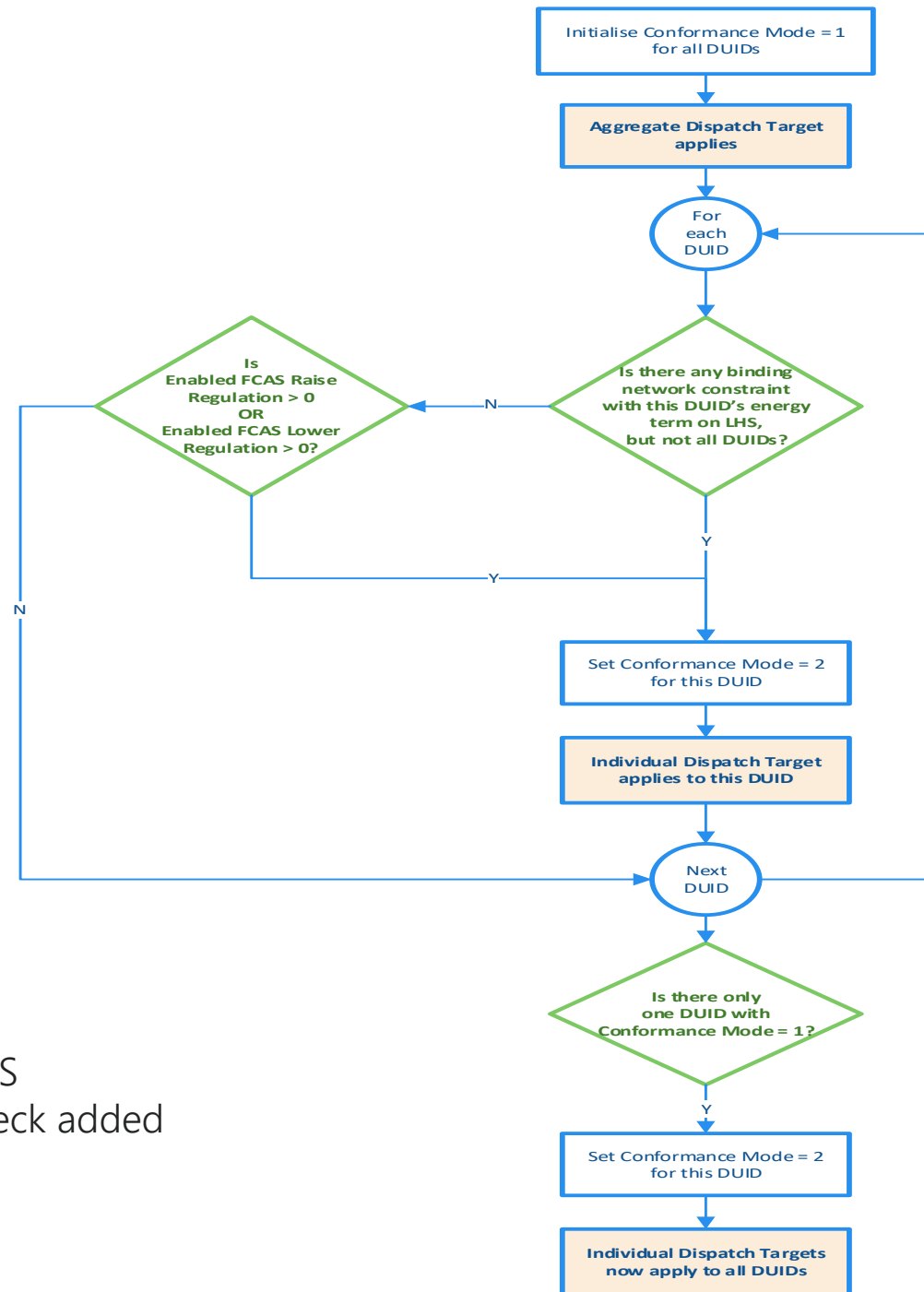
Alternative ADC for a Mixed Aggregate

AEMO's Aggregate Dispatch Conformance Assessment



Alternative ADC for a Mixed Aggregate

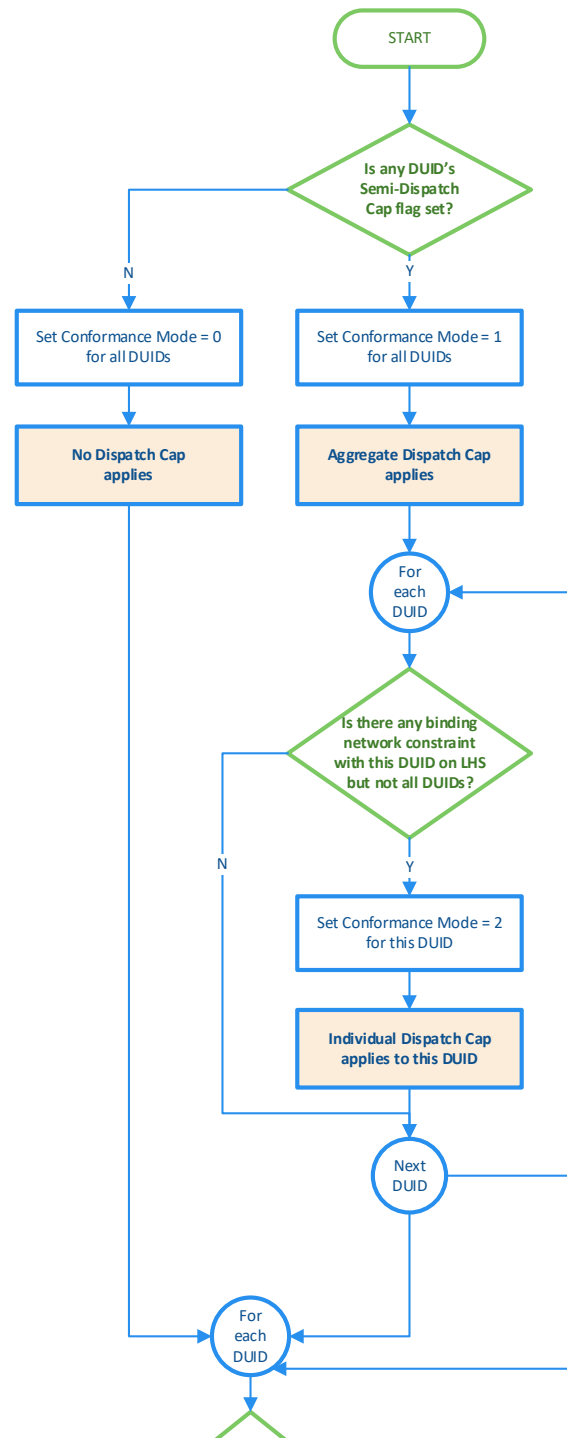
Setting the Conformance Mode



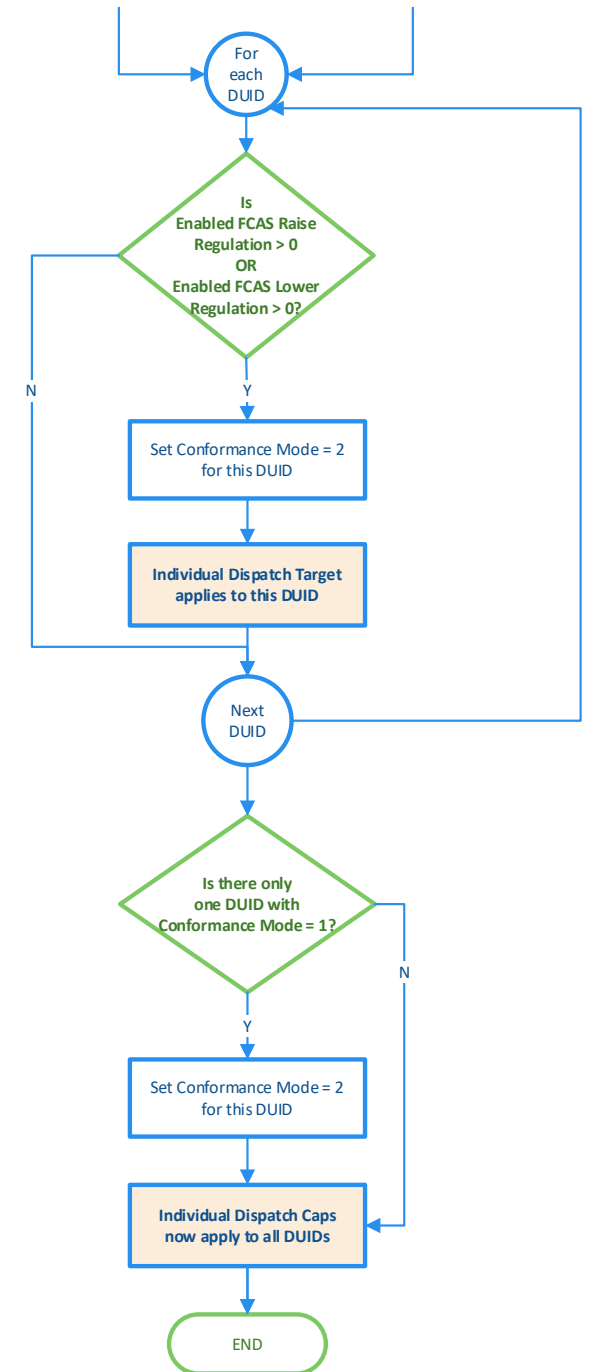
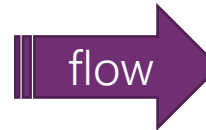
- Regulation FCAS enablement check added

Alternative ADC for a Cap Aggregate

Setting the Conformance Mode



- Regulation FCAS enablement check added



Issues for feedback

INFO PAPER REFERENCE	TOPIC	ISSUE FOR FEEDBACK
Question 2	FCAS enablement and ADC	AEMO has included the FCAS regulation enabled logic in the Cap Aggregate, despite it being unlikely that there will be any semi-scheduled units providing FCAS regulation in a Cap Aggregate. Are there scenarios where this is likely to be possible?

Intersection of ADC, FCAS and network constraints

CAN AGGREGATE DISPATCH CONFORMANCE BE USED WHEN...

	... Enabled for FCAS regulation?		... Providing contingency FCAS?		... A network constraint is applied to a unit in the aggregate?	
Target	✓	Yes, always conforming in aggregate.	✓	Yes, provided: <ul style="list-style-type: none"> operating within trapezium have sufficient headroom and footroom. 	✓	Yes, always conforming in aggregate
Mixed	✗	No. Regulation FCAS enabled unit must individually conform (i.e. follow its individual AGC set-point).	✓	Yes, provided: <ul style="list-style-type: none"> operating within trapezium have sufficient headroom and footroom. 	✗	Constrained unit must individually conform.
	✓	Any remaining units (not enabled for regulation FCAS) in the aggregate may conform in aggregate			✓	Any remaining unconstrained units in the aggregate may conform in aggregate.
Cap	✗	No. Regulation FCAS enabled unit must individually conform (i.e. follow its individual AGC set-point).	✓	Yes, provided: <ul style="list-style-type: none"> operating within trapezium have sufficient headroom and footroom. 	✗	Constrained unit must individually conform.
	✓	Any remaining units (not enabled for regulation FCAS) in the aggregate may conform in aggregate			✓	Any remaining unconstrained units in the aggregate may conform in aggregate.

Issues for feedback

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Question 1	Types of dispatch conformance logic	Are there any scenarios where the Target Aggregate arrangement should be retained after the IESS Final Release (03 June 2024)?
Question 2	FCAS enablement and ADC	AEMO has included the FCAS regulation enabled logic in the Cap Aggregate, despite it being unlikely that there will be any semi-scheduled units providing FCAS regulation in a Cap Aggregate. Are there scenarios where this is likely to be possible?
Question 3	FCAS enablement and ADC	<p>Should the definition of Target Aggregate broaden beyond existing batteries to include other scheduled units?</p> <p>AEMO invites feedback from stakeholders on:</p> <ul style="list-style-type: none"> • Whether there is stakeholder appetite for registering Aggregates for ADC that comprise scheduled units only (without any semi-scheduled generating units) • From a technical perspective, whether remaining on individual AGC setpoints, or moving to a single AGC setpoint, is preferred.

5. Q&A

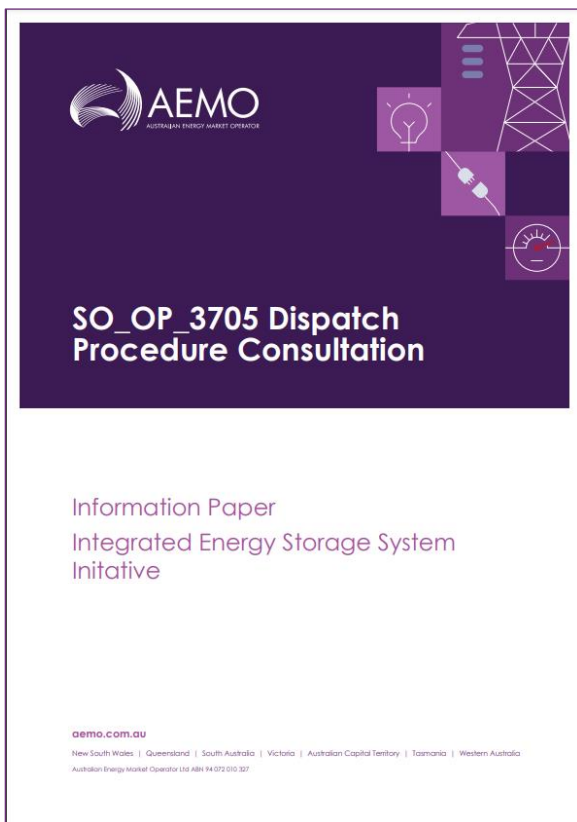


6. Next steps

Emily Brodie



Next steps: Dispatch procedure consultation



SO_OP_3705 Dispatch Procedure	TIMING
Publication of draft Dispatch Procedure information paper and change marked procedure	Tue 29 Nov 2022
Stakeholder information session on information paper	Wed 30 Nov 2022
Written stakeholder feedback on draft information paper	Fri 20 Jan 2023
Publication of final Dispatch Procedure	Fri 10 Feb 2023

Documents published on AEMO's website:

<https://aemo.com.au/consultations/current-and-closed-consultations/dispatch-procedure-dynamic-adc>

7. Thanks and close





Thank you for joining today's session!
If any questions, contact us at IESS@aemo.com.au

For more information visit

aemo.com.au

Appendix A: Sample dispatch instruction and conformance report

Sample dispatch conformance report

C NEMP.WORLD DISPATCH_CONFORMANCE AEMO HYBRID1 21/10/2021 17:45:10 359599397 ATCH_CONFORMANCE															
I	DISPATCH	ADG_CONFORMANCE	1	INTERVAL_DATETIME	ADG_ID	TOTALCLEARED	ACTUALMW	ROC	STATUS	PARTICIPANT_STATUS_ACTION	OPERATING_MODE	LASTCHANGED	ADC Assessed		
D	DISPATCH	ADG_CONFORMANCE	1	21/10/2021 09:35	ADG_01	230	230	9	NORMAL	No action required. Aggregate is following aggregate dispatch target	AUTO	21/10/2021 17:45	Y		
I	DISPATCH	UNIT_CONFORMANCE	1	INTERVAL_DATETIME	DUID	TOTALCLEARED	ACTUALMW	ROC	STATUS	PARTICIPANT_STATUS_ACTION	OPERATING_MODE	LASTCHANGED	ADG_ID	SEMIDISPATCHCAP	CONFORMANCE_MODE
D	DISPATCH	UNIT_CONFORMANCE	1	21/10/2021 09:35	SF1	100	100	3	NORMAL	No action required.	AUTO	21/10/2021 17:45	ADG_01	1	1
D	DISPATCH	UNIT_CONFORMANCE	1	21/10/2021 09:35	WF1	50	150	3	NORMAL	No action required.	AUTO	21/10/2021 17:45	ADG_01	0	1
D	DISPATCH	UNIT_CONFORMANCE	1	21/10/2021 09:35	BESS1G	80	0	3	NORMAL	No action required.	AUTO	21/10/2021 17:45	ADG_01	0	1
D	DISPATCH	UNIT_CONFORMANCE	1	21/10/2021 09:35	BESS1L	0	20	3	NORMAL	No action required.	AUTO	21/10/2021 17:45	ADG_01	0	1
C	END OF REPORT		9												

for info only: Only Conformance_Mode is used for ADG monitoring

Sample dispatch instruction

							Energy targets to meet in aggregate (230 MW) across all DUIDs belonging to Aggregate System, subject to DUID 'SF1' capping to its individual energy target (100 MW) and DUID 'BESS1G' to meet its energy target (80MW) and be enabled for Regulation FCAS (10MW).					
							Participant will need to determine aggregate energy target as: Sum(Gen) - Sum(Load)					
C	NEMP.WORLD	DISPATCHIS	AEMO	HYBRID1	21/10/2021	09:30:13						
I	DISPATCH	CONSTRAINT	5	SETTLEMENTDATE	RUNNO	CONSTRAINTID	MARGINALVALUE					
D	DISPATCH	CONSTRAINT	5	21/10/2021 09:35	1	#SF1_E	20					
I	DISPATCH	UNIT_SOLUTION	2	SETTLEMENTDATE	RUNNO	DUID	CONNECTIONPOINTID	TOTALCLEARED	LOWERREG	RAISEREG	DO NOT USE SEMIDISPATCHCAP	NEW CONFORMANCE_MODE
D	DISPATCH	UNIT_SOLUTION	2	21/10/2021 09:35	1	SF1	QSF1	100	0	0	1	2
D	DISPATCH	UNIT_SOLUTION	2	21/10/2021 09:35	1	WF1	QWF1	50	0	0	0	1
D	DISPATCH	UNIT_SOLUTION	2	21/10/2021 09:35	1	BESS1G	QBESS1	80	10	0	0	2
D	DISPATCH	UNIT_SOLUTION	2	21/10/2021 09:35	1	BESS1L	QBESS1	0	0	0	0	1

DUID 'SF1' is in a binding network constraint '#SF1_E'

SF1, WF1 are semi-scheduled gens
BESS1G is scheduled gen
BESS1L is scheduled load

DUID 'WF1' is enabled for Regulation FCAS

Aggregate System ignores the SEMIDISPATCHCAP flag and uses the new CONFORMANCE_MODE instead

Note the SEMIDISPATCHCAP flag = 1 for DUID 'SF1' because it is in a binding constraint '#SF1_E'

If CONFORMANCE_MODE = 1 then DUID can operate as part of an aggregate to meet the aggregated energy target

If CONFORMANCE_MODE = 2 then DUID must conform to its individual energy target. This is set because DUID 'SF1' alone is in a binding network constraint '#SF1_E' and DUID 'BESS1G' has Regulation FCAS enabled.