



Automated procedures for identifying FCAS pricing errors

Final Report and Determination

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New South Wales | Queensland | South Australia | Victoria | Australian Capital Territory | Tasmania | Western Australia

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Executive summary

The publication of this final report concludes the consultation process conducted by AEMO to extend the automated procedures for determining a Frequency Control Ancillary Services (**FCAS**) manifestly incorrect input (**MII**) under the National Electricity Rules (**NER**).

The consultation was undertaken as required by NER 3.9.2B(h). It followed two incidents in 2022 where input errors affected FCAS dispatch. During the submission period, AEMO published a draft procedure to assist parties wishing to make submissions. AEMO thanks all stakeholders for their feedback on the consultation.

In the consultation paper, AEMO proposed a FCAS requirement threshold of 450 megawatts (MW) for triggering MII automated procedures.

In response to the consultation paper on the proposal, AEMO received 3 written submissions. All these submissions supported extending the automated procedures to include the FCAS requirement threshold to detect the incorrect input (MII) for FCAS. These submissions suggested different, higher threshold levels for AEMO to consider. The higher threshold levels aim to reduce the number of false positives while retain effectiveness of the automated procedure to detect FCAS MII.

AEMO has determined to set the FCAS requirement threshold trigger to be 500 MW after considering the submissions received. AEMO's final determination is to amend automated procedures to include the detection of FCAS MII, using FCAS requirement thresholds of 500 MW, with a proposed implementation date set prior to the summer of 2023/24.

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1. Stakeholder consultation process

As required by National Electricity Rules (**NER**) clause 3.9.2B(h), AEMO has consulted on the extension of the automated procedures for determining a FCAS manifestly incorrect input.

Note that this document uses terms defined in the NER, which are intended to have the same meanings.

AEMO's process and timeline for this consultation are outlined below in Table 1.

Table 1 Consultation process and timeline

Consultation steps	Dates
Notice of consultation and draft report published	13 April 2023
Submissions due on draft report	25 May 2023
Final report published	5 July 2023 ¹

AEMO's consultation webpage for the proposal is available at <https://aemo.com.au/consultations/current-and-closed-consultations/consultation-on-the-amendment-of-automated-procedures-for-determining-a-manifestly-incorrect-input>, containing all published papers and reports, written submissions, and other consultation documents or reference material.

In response to its consultation paper on the proposal, AEMO received **3** written submissions. AEMO considered these submissions and other relevant information in developing the final determination on the proposal.

AEMO thanks stakeholders for their feedback on the proposal throughout this consultation, which has been considered in preparing this final report.

¹ The original publication date proposed in the [Consultation Paper](#) for this Final Report and Determination was 20 July 2023, however, AEMO brought this publication date forward, in order to provide transparency to its stakeholders as soon as it was practicable to do so.

2. Background

2.1. Context for this consultation

In 2021, AEMO conducted a consultation on the automated procedures for determining a manifestly incorrect input (MII). The matter for that consultation was to revise trigger levels in the automated procedures for identifying whether a dispatch price is subject to review. The proposed trigger levels were for flows on the Terranora and Heywood interconnectors².

Over the course of 2022 two distinct set of events occurred on 6 April in Tasmania and on 10 August in the NEM, that led to abnormally high local requirements and locally dispatched FCAS quantities. Extreme price spikes in the FCAS markets have followed these events. Further details of these events are available as case studies in Appendix 1 of the Consultation Paper³.

In the Effectiveness of Automated Procedures for Identifying Trading Intervals Subject to Review Report, published in November 2022, AEMO proposed to investigate and then to extend the MII process to include detecting frequency control ancillary services (FCAS) MIIs using FCAS requirement thresholds⁴.

2.2. NER requirements

NER 3.9.2B(h) requires AEMO, in consultation with Registered Participants, to develop procedures for the automatic identification of trading intervals subject to review. The purpose of the Automated Procedures is to detect instances where a MII may have resulted in material differences in pricing outcomes.

In accordance with NER 3.9.2B(k), AEMO must also review the effectiveness of the Automated Procedures referred to in NER 3.9.2B(h) at least once each calendar year.

² <https://aemo.com.au/consultations/current-and-closed-consultations/amendment-of-automated-procedures-for-determining-a-manifestly-incorrect-input-consultation>

³ https://aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2023/consultation-on-the-amendment-of-automated-procedures-for-determining/automated-procedures-for-identifying-fcas-pricing-errors_consultation-paper.pdf?la=en

⁴ https://aemo.com.au/-/media/files/electricity/nem/security_and_reliability/dispatch/policy_and_process/effectiveness-of-automated-procedures-for-identifying-trading-intervals-subject-to-review-2021.pdf?la=en

3. Discussion of material issues

3.1. FCAS MII Threshold

3.1.1. Issue summary and submissions

In the latest Effectiveness of Automated Procedures for Identifying Trading Intervals Subject to Review Report, AEMO proposed to investigate and then to extend Automated Procedures to include detecting FCAS MIIs using an FCAS requirement threshold.

To determine an appropriate FCAS requirement threshold, AEMO analysed instances where large amounts of FCAS were locally dispatched through the past five years. Based on the analysis, in its Consultation Paper AEMO proposed a trigger of 450 MW FCAS requirement to detect FCAS MIIs. This 450 MW FCAS requirement threshold was to apply to all FCAS markets and in each region, separately.

The requirement threshold trigger was determined to be likely to be able to detect FCAS MIIs effectively and decrease the probability of MIIs being declared incorrectly.

Submission Received

In response to its consultation paper on the proposal, AEMO received 3 written submissions from Shell Energy, CS Energy and the Australian Energy Council.

All these submissions were supportive of applying the Automated procedures to determine manifestly incorrect input (MII) for FCAS. However, all the submissions suggested increasing the initially proposed threshold level of 450 MW.

Shell Energy suggested that the MII FCAS trigger can be changed from AEMO proposed 450 MW to 550 MW.

Shell Energy noted that as the NEM transitions closer to meeting decarbonisation targets, “schedulable generation is being replaced by un-schedulable variable output generation, sometimes connected at common single credible connection points”. This trend, coupled with the upcoming implementation of the very fast contingency FCAS markets where actual enablement values are yet to be seen, could lead to higher enablement values that the NEM has historically seen. In Shell's view, the increased threshold would reduce the disproportionate rate of false positive MII declarations which places unwarranted stress to the market and AEMO staff.

CS Energy has put forward a FCAS requirement threshold of 480 MW. In CS Energy's view the proposed 450 MW threshold was too close to historically occurring, larger FCAS requirements, and could potentially increase the risk of a false positives which would be undesirable for both AEMO and NEM participants.

CS Energy also noted that in electrical island operation would likely lead to higher FCAS requirements, which would, in turn also require a revised threshold to apply in the separated areas.

The Australian Energy Council (the AEC) was supportive of AEMO's proposed approach to amend the Automated procedures to determine manifestly incorrect input (MII) for FCAS. The AEC was of the view that a 550 MW threshold would be better suited to strike the right balance between avoiding excessive false positives and missing false negatives.

3.1.2. AEMO's assessment

AEMO has considered stakeholder submissions and concluded that a threshold higher than the originally proposed 450 MW is appropriate and would not adversely impact the balance of increased false positives and potentially missed erroneous intervals.

AEMO also acknowledges that during prolonged market suspension or islanding events, locally dispatched FCAS quantities may be higher than what's been historically observed, but still be based on genuine power system requirements. To reduce the disproportionate rate of false positive MII declarations AEMO agrees to increase the proposed FCAS threshold trigger from 450 to 500 MW.

AEMO notes that the analysis of intervals with large FCAS requirements and dispatched quantities conducted in the draft determination has shown that historical values have typically not exceeded 450 MW and only under the unusual circumstances of a prolonged market suspension exceeded 470 MW. All intervals in the analysis that would have been flagged as MIIs under the currently determined framework were higher than 600 MW, hence the amended, 500 MW threshold would have correctly identified and flagged them as subject to review.

AEMO also considers the variance of FCAS requirement thresholds for different regions and different FCAS markets. This consideration aligns with CS Energy's submission that the electrical island operation may require a threshold in the separated areas. Although a uniform threshold trigger (with the same value being applied in each NEM region) will be implemented for the FCAS MII automated procedure at this stage, the thresholds will be revised if false negative or false positive could normally appear in the future.

AEMO is of the view, that once enough historical data is accumulated on the performance of these triggers, it will become possible to review whether threshold values should be adjusted based on potentially differing trend across FCAS services and NEM regions.

3.1.3. AEMO's conclusion

AEMO concludes to extend Automated Procedures to include detecting FCAS MIIs using an FCAS requirement threshold.

AEMO will set a uniform FCAS requirement threshold at this stage, and this trigger is 500 MW. AEMO is of the view that this trigger can effectively balance the risk of producing excessive numbers of false positives and missing false negatives.

This trigger level will be reviewed annually. AEMO will not exclude the possibility to set separate triggers for different regions and FCAS services in the future.

4. Other matters

Other than the level of proposed FCAS requirement thresholds, CS Energy and Shell Energy have also submitted comments on the Automated Procedures during market suspension and during Administered Price Period (APP).

Automated Procedure during Market Suspension

CS Energy questioned how the MII automated procedure works during market suspension.

Shell Energy also commented on the value to the market of the continued use of the MII process during a market suspension period. Participants were concerned that the market suspension pricing schedule applied during the market suspension and the MII process has the potential to result in skewed price outcomes. Shell Energy suggested AEMO to review this process to ensure it supports efficient outcomes in the application of the market suspension pricing schedule.

AEMO notes that the Automated Procedures will remain active during market suspension. However, this process will not skew the price outcomes as through the price management process⁵, the market suspension pricing schedule is applied last, and hence prevails over the price that the Automated Procedures might bring forward.

Based on Shell Energy's submission, AEMO also considered the value of continuing the MII process during a market suspension period. Since the market suspension pricing schedule will prevail through the process, deactivating the MII automated procedures during market suspension would be reasonable. This could reduce the amount of market notices which is triggered by the MII procedures and sent out by AEMO during the market suspension, and thus give clearer signals to the market and participants. However, at the same time, a complete deactivation of the procedures during such circumstance could potentially lead to missing faulty inputs.

While AEMO recognises the importance of this issue, we are also of the view that the materiality of turning the automated procedures off in such cases would be out of the scope of this current consultation and would warrant a separate consultation.

Automated Procedure during Administered Price Period

In their submission, CS Energy inquired about price outcomes if a MII event is confirmed in the first interval of an APP.

In practice in such a case, if a MII event is confirmed, the prices are rejected and replaced with the prices from the preceding interval that was not subject to review. However, these revised prices will still be capped by the administered price cap while the APP is active. It must also be noted that the first interval of APP does not require its price to be manually reviewed.

⁵ AEMO has established processes in place through which it manages price revisions, administered price periods and periods affected by the market price cap.

Previous reports on the Effectiveness of Automated Procedures for Identifying Trading Intervals Subject to Review

In their submissions the AEC and Shell Energy noted that AEMO's previous reports on the effectiveness of the procedures were difficult to locate on AEMO's website.

AEMO has, in response, prepared the below table of reports from the past 10 years with links to the documents to further increase transparency in relation to this matter.

Table 2 Historical reports on the effectiveness of the procedures

Report name with website link	Reporting period	Publication date
Effectiveness of Automated Procedures for Identifying Trading Intervals Subject to Review	2021	Nov 2022
Effectiveness of Automated Procedures for Identifying Dispatch Intervals Subject to Review	2020	Oct 2021
The Effectiveness of Automated Procedures for Identifying Dispatch Intervals Subject to Review	2019	Jul 2020
The Effectiveness of Automated Procedures for Identifying Dispatch Intervals Subject to Review	2018	Aug 2019
The Effectiveness of Automated Procedures for Identifying Dispatch Intervals Subject to Review	2017	Oct 2018
The Effectiveness of Automated Procedures for Identifying Dispatch Intervals Subject to Review	2016	May 2017
The Effectiveness of Automated Procedures for Identifying Dispatch Intervals Subject to Review	2015	Feb 2016
The Effectiveness of Automated Procedures for Identifying Dispatch Intervals Subject to Review	2014	Feb 2016
The Effectiveness of Automated Procedures for Identifying Dispatch Intervals Subject to Review	2013	Oct 2014
The Effectiveness of Automated Procedures for Identifying Dispatch Intervals Subject to Review	2012	Oct 2014

5. Final determination on proposal

Having considered the matters raised in submissions to the draft report, AEMO's final determination is to amend Automated Procedures to include the detection of FCAS MII, using FCAS requirement thresholds.

The final amendment to the Automated Procedures differs from the draft determination in one material respect for the reasons discussed in section 3 of this final report.

This material change is changing the FCAS requirement threshold for triggering MII automated procedures from 450 MW to 500MW.

This 500 MW FCAS requirement threshold will apply to all FCAS markets as shown in Table 2.

Table 3 FCAS requirements proposed for FCAS MII automated procedures

FCAS market	MI trigger – FCAS requirement (MW)
Raise 6 sec (R6)	500
Raise 60 sec (R60)	500
Raise 5 min (R5)	500
Raise regulation (RREG)	500
Lower 6 sec (L6)	500
Lower 60 sec (L60)	500
Lower 5 min (L5)	500
Lower regulation (LREG)	500
Raise 1 sec (from October 2023 onward)	500
Lower 1 sec (from October 2023 onward)	500

Effective date

The effective date of this determination is expected to be finalised before the Summer of 2023/2024.

Implementation

After considering existing program commitments, AEMO aims to implement the new trigger level for summer 2023/24. Further updates on implementation including a final version of the Automated procedures for identifying intervals subject to review will be communicated through AEMO communications and market notices.