



Automated procedures for identifying FCAS pricing errors

Consultation paper

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

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Summary and consultation notice

The publication of this draft report commences AEMO's consultation on the extension of the automated procedures for determining a Frequency Control Ancillary Services (**FCAS**) manifestly incorrect input (**MII**) under the National Electricity Rules (**NER**).

This consultation is undertaken as required by NER 3.9.2B(h).

In AEMO's review of the Automated Procedures for Identifying Trading Intervals Subject to Review for 2021, AEMO recommended an investigation into extending the automated procedures to include identification of errors affecting FCAS pricing results. The review is complete and AEMO is consulting on a new MII threshold for FCAS markets.

AEMO has prepared this draft report and determination to facilitate informed debate and seek feedback from industry about extending the MII process to include the detection of FCAS MII, using FCAS requirement thresholds.

AEMO is proposing a FCAS requirement threshold of 450 megawatts (MW) for triggering MII automated procedures. The FCAS requirement threshold will be able to detect FCAS MII and retain the efficiency of the existing automated procedures.

Consultation notice

AEMO invites written submissions from interested persons on the draft proposal and issues identified in this draft report to istvan.szabo@aemo.com.au by 5:00 pm (Australian Eastern Standard Time) on 25 May 2023.

Submissions may make alternative or additional proposals you consider may better meet the objectives of this consultation and the national electricity objective in section 7 of the National Electricity Law. Please include supporting reasons.

Please note the following important information about submissions:

- All submissions will be published on AEMO's website, other than confidential content.
- Please identify any parts of your submission that you wish to remain confidential and explain why. AEMO may still publish that information if it does not consider it to be confidential but will consult with you before doing so. Material identified as confidential may be given less weight in the decision-making process than material that is published.
- Submissions received after the closing date and time will not be valid, and AEMO is not obliged to consider them. Any late submissions should explain the reason for lateness and the detriment to you if AEMO does not consider your submission.

Interested persons can request a meeting with AEMO to discuss any particularly complex, sensitive or confidential matters relating to the proposal. Meeting requests must be received by the end of the submission period and include reasons for the request. AEMO will try to accommodate reasonable meeting requests but, where appropriate, may hold joint meetings with other stakeholders or convene a meeting with a broader industry group. Subject to confidentiality restrictions, AEMO will publish a summary of matters discussed at stakeholder meetings.

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1. Stakeholder consultation process

As required by clause 3.9.2B(h) of the NER, AEMO is consulting 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 expected timeline for this consultation are outlined below. Future dates may be adjusted and additional steps may be included as needed, as the consultation progresses.

Table 1 Consultation process and timeline

| Consultation steps | Indicative dates |
|---|------------------|
| Notice of consultation and draft report published | 13 April 2023 |
| Submissions due on draft report | 25 May 2023 |
| Final report published | 20 July 2023 |

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 interconnectors¹.

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 thresholds².

AEMO is proposing a FCAS requirement threshold for triggering MII automated procedures. The FCAS requirement threshold should be able to detect FCAS MII and remain the effectiveness of the existing automated procedures.

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.

¹ <https://aemo.com.au/consultations/current-and-closed-consultations/amendment-of-automated-procedures-for-determining-a-manifestly-incorrect-input-consultation>

² 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. Draft determination

3.1. Draft determination

AEMO's draft determination is to extend the Automated Procedures to include detecting FCAS MIIs using an FCAS requirement threshold.

To determine an appropriate FCAS requirement threshold, AEMO analysed FCAS requirement data from the past five years. The analysis involved ranking the maximum FCAS requirement for each interval and region across all FCAS markets.

A clear distinction of the maximum FCAS requirement was observed between periods with and without incorrect inputs. During all incorrect input intervals, the maximum FCAS requirement exceeded 720 MW, whereas the requirement was less than 480 MW during other intervals.

Among intervals without incorrect inputs, the maximum FCAS requirements were mostly distributed between 220 MW and 300 MW, with less than 1% of intervals above 380 MW. The majority of large FCAS requirements (>450 MW) occurred during the prolonged market suspension period in 2022. Outside of the period affected by the market suspension, the largest FCAS requirements observed were 447 MW on 14 September 2022 in Victoria and 444 MW on 4 January 2020 in New South Wales.

Based on the above analysis, AEMO considers the initial threshold for identifying affected trading intervals should be based on conditions that can be considered business as usual and a suspended market would not satisfy that criterion. It is possible that a 450 MW threshold instead of a 480 MW threshold could produce false positives during market suspension. However, affected trading intervals are subject to manual verification and AEMO considers the risk of a false positive resulting in a price revision is small. Because of this, AEMO proposes a trigger of 450 MW FCAS requirement to detect FCAS MIIs.

This 450 MW FCAS requirement threshold will apply to all FCAS markets as shown in Table 2. The requirement threshold trigger is likely to be able to detect FCAS MIIs effectively and decrease the probability of MIIs being declared incorrectly. The proposed MII FCAS threshold would have detected and enabled action to be taken in a timely fashion to address issues seen in the two case studies in Appendix A.

Table 2 FCAS requirements proposed for FCAS MII automated procedures

| FCAS market | MII trigger – FCAS requirement (MW) |
|---|-------------------------------------|
| Raise 6 sec (R6) | 450 |
| Raise 60 sec (R60) | 450 |
| Raise 5 min (R5) | 450 |
| Raise regulation (RREG) | 450 |
| Lower 6 sec (L6) | 450 |
| Lower 60 sec (L60) | 450 |
| Lower 5 min (L5) | 450 |
| Lower regulation (LREG) | 450 |
| Raise 1 sec (implement in October 2023) | 450 |
| Lower 1 sec (implement in October 2023) | 450 |

3.2. Effective date

AEMO's proposed effective date for the determination is **4 October 2023**.

Appendix A. Case studies

Case study 1

On 6 April 2022, a data error caused large FCAS requirement in Tasmania.

One 5-minute trading interval was affected by an incorrect FCAS configuration file setting Tasmanian load relief for a high-frequency event. This resulted in a local requirement for L5 and LREG service in Tasmania of more than 50,000 MW compared to no local requirement in the previous interval. All available L5 service (1,056 MW) and LREG (129 MW) in Tasmania were dispatched as a result, and the price for L5 and LREG FCAS in Tasmania was \$6,411.50³.

With the inclusion of the FCAS requirement threshold into the Automated Procedures, the above data error could have been detected. The proposed trigger of 450 MW would have flagged the incident as subject to review, giving AEMO the ability to accept the error and automatically revise prices.

Table 3 Tasmania FCAS requirements on 6 April 2022 16:40 (AEST)

| FCAS market | FCAS requirement (MW) |
|------------------|---------------------------------|
| Raise 6 sec | 96.41 |
| Raise 60 sec | 60.34 |
| Raise 5 min | 0 |
| Raise regulation | 0 |
| Lower 6 sec | 74.84 |
| Lower 60 sec | 55.38 |
| Lower 5 min | 1,056.70 (subject to review) |
| Lower regulation | 129.31 |

Case study 2

On 10 August 2022, a defective National Electricity Market Dispatch Engine (NEMDE) calculation resulted in 13 intervals having an incorrect input.

A detailed scheduling error report documented the incident from trading interval 1135 hrs to trading interval 1235 hrs on 10 August 2022⁴.

The 13 5-minute trading intervals (1135 hrs to 1235 hrs) were affected by a dispatch error resulting in high volumes of FCAS L6, L60, R6 and R60 requirements for the NEM. The requirements were unable to be met, violating the requirements and resulting in prices at or near the market price cap of \$15,500 for each of these services.

Table 4 lists the maximum regional FCAS requirements during the incident on 10 August 2022. If the FCAS requirement threshold was introduced, these intervals would have been detected by the

³ https://aemo.com.au/-/media/files/electricity/nem/market_notices_and_events/market_event_reports/2022/nem-dispatch-constraint-calculation-scheduling-error-6-april-2022.pdf?la=en

⁴ https://aemo.com.au/-/media/files/electricity/nem/market_notices_and_events/market_event_reports/2022/nem-dispatch-engine-constraint-calculation-error-10-august-2022.pdf?la=en

Automated Procedures and flagged as subject to review. This would have allowed AEMO to accept the error and revise prices.

Table 4 Maximum regional FCAS requirements (MW) during the incorrect input period on 10 August 2022

| Dispatch Interval | Raise 6 sec | Raise 60 sec | Raise 5 min | Raise regulation | Lower 6 sec | Lower 60 sec | Lower 5 min | Lower regulation |
|-------------------|-------------|--------------|-------------|------------------|-------------|--------------|-------------|------------------|
| 10/08/2022 11:35 | 770.33 | 846.35 | 287.89 | 107.86 | 626.4 | 758.4 | 190.09 | 132.84 |
| 10/08/2022 11:40 | 796 | 931.62 | 262.51 | 114.33 | 581.58 | 758.58 | 238.41 | 86 |
| 10/08/2022 11:45 | 775 | 1023.56 | 294.77 | 149.08 | 596.48 | 773.48 | 192.14 | 94 |
| 10/08/2022 11:50 | 772 | 1011.76 | 296.39 | 131 | 623 | 795.12 | 216.33 | 108.83 |
| 10/08/2022 11:55 | 777 | 1012.87 | 302.34 | 71.6 | 622 | 796.52 | 227 | 90.7 |
| 10/08/2022 12:00 | 778 | 1016.48 | 297.35 | 135 | 557 | 858.64 | 219 | 88 |
| 10/08/2022 12:05 | 783 | 1025.82 | 297.71 | 104.24 | 557 | 942.42 | 208 | 102 |
| 10/08/2022 12:10 | 806.98 | 1070.82 | 300.09 | 132 | 551 | 988.42 | 207 | 88 |
| 10/08/2022 12:15 | 789.98 | 1070.82 | 277.1 | 99.72 | 551 | 988.42 | 205.88 | 86.03 |
| 10/08/2022 12:20 | 788.98 | 1070.82 | 287.08 | 87.72 | 592 | 988.42 | 220.38 | 81.59 |
| 10/08/2022 12:25 | 781.98 | 1070.82 | 264.05 | 81.47 | 591 | 988.42 | 195.77 | 105 |
| 10/08/2022 12:30 | 779.98 | 1070.82 | 228.46 | 110 | 592 | 988.42 | 208 | 95 |
| 10/08/2022 12:35 | 776.98 | 1070.82 | 231.81 | 82.2 | 591 | 988.42 | 220.13 | 100 |