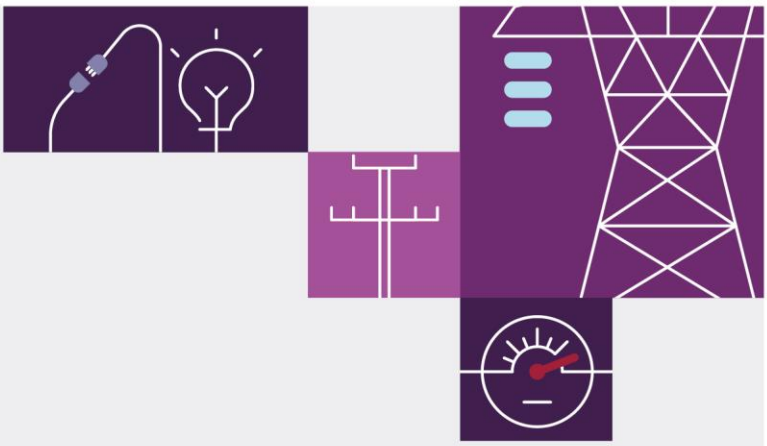
AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

Summary of Submissions

July 2023

WEM Procedure: GPS Compliance Tests and Generator Monitoring Plans



Important notice

Purpose

AEMO must publish, together with a final WEM Procedure, a summary of submissions received and the response of AEMO to issues raised in those submissions, with respect to amendments to Procedures required to be developed under:

- For clause 1.36.7(b) – Wholesale Electricity Market Amendment (Tranche 1 Amendments) Rules 2020.
- For clause 1.43.7(b) – Wholesale Electricity Market Amendment (Tranche 2 and 3 Amendments) Rules 2020.
- For clause 1.43A.6 – Wholesale Electricity Market Amendment (Tranche 5 Amendments) Rules 2021.
- For clause 1.43B.1 – Wholesale Electricity Market Amendment (Tranche 6 Amendments) Rules 2022 and (Tranche 6A Amendments) Rules 2023.

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Submissions and AEMO's Response

The following written submissions were received as part of AEMO's stakeholder consultation.

Relevant Procedure Paragraph(s)	Submission	AEMO's Response
2. GPS Test Procedure Requirements: General comments	The Procedure doesn't refer to the definition of "significant maintenance" as set out in the Relevant Generator Modification ("RGM") Guideline, published by Western Power. For clarity, we suggest that the Procedure refers to "significant maintenance" as per the meaning given in the RGM Guideline. This clarity is important for participants, as significant maintenance could trigger a revalidation of Generator Performance Standards. Additionally, as the definition of significant maintenance isn't provided, this implies GPS testing for an existing generator returning to service post-outage. If GPS testing is required after every outage, this can have considerable cost implications associated with testing, and loss of opportunity to generate for an extended period. Considering this, we suggest that AEMO clarify its classification of planned outages regarding GPS re-testing.	The WEM Procedure refers to 'significant maintenance' as one reason that a Market Participant must perform tests to demonstrate and verify compliance with relevant Registered Generator Performance Standards on a Transmission Connected Generating System, refer to paragraph 2.1.1. While this term is also used in the Relevant Generator Modification Guideline published by Western Power, this term will be further clarified in the revised 'Commissioning Tests" WEM Procedure that will be published closer to the commencement of the New WEM Commencement Day in accordance with WEM Rules 3.21A.5 and 3.32A.27 that form part of the Tranche 2 & 3 amendments (Schedule B).
2.3.2(a) and 2.3.2(b)	Suggest that the scope of 2.3.2(a) and 2.3.2(b) should be limited to the guidelines of 2.3.6.	This paragraph has been amended to incorporate requirements described in paragraph 2.3.6 to replace (c), however remaining items have been retained, noting that a GPS test procedure must be prepared using the GPS Test Procedure Template and must incorporate Appendix B tests.
2.3.6(o)	Suggest the Procedure also clarifies these requirements for Market Participants: • Duration of data sampling for test and minimum sample size requirement; and • Pre and post event data recording duration	AEMO considers that test duration and sampling requirements will vary significantly due to the type of test being performed and the desired outcome. There may be scope in future to publish additional guidance in a separate guideline, but this remains beyond the scope of this WEM Procedure.
2.3.6(q)(i) and 2.3.7	The risk information of network-impact for a particular test can come from the Network Operator or AEMO due to availability of information. We suggest including a section for identification of relevant risks in the Test Plan for the Network Operator/AEMO to populate and inform. The Market Participant (Generator) can identify risks local to its	Paragraph 2.3.6(q) has been modified to state "information about any potential risks associated with the GPS Test Procedure, which **may** include, but is not limited to…" to reflect that not all risks may be able to be identified by a Market Participant. The preparation of a proposed GPS Test procedure will continue to be the sole responsibility of a Market Participant

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	facility, including damage to equipment, health & safety and unit outage.	responsible for the relevant Transmission Connected Generating System. However, in accordance with paragraph 5.1.6, AEMO must share the proposed GPS Test Procedure with the Network Operator for review, any additional network risks that are unknown to the Market Participant would be identified during this stage. Additional Network or System operational risks would be considered by the Network Operator and AEMO as part of the review of the accompanying Commissioning Test Plan. Relevant feedback will be provided to the Market Participant as part of this process.
2.3.11	Tests in Appendix B are subject to agreement between Market Participant and AEMO. The outcome of the agreement (approved GMP) should be the requirement and not Appendix B as is.	Paragraph 2.3.11 gives guidance to suitable testing methods that should be proposed as part of a GPS Test Procedure. It does not relate to Generator Monitoring Plans. Approval of a Generator Monitoring Plan is covered in paragraph 5.2.
2.4.2	For Existing Market Generators, this would be a negotiated standard which may be below the minimum standard.	All Transmission Connected Generating Systems that are required to prepare a GPS Test Procedure must develop and execute tests to demonstrate compliance with their Registered Generator Performance Standard. An Existing Transmission Connected Generating System will follow a different process to register (ref WEM Rules 1.40).
2.4.6	If AEMO is required to review data and provide written approval to the Market Participant (an existing connected Generator) this might affect the Return to Service of the units following an outage or significant maintenance activity. Our preference is that this review and written approval is not mandatory.	An appropriate level of due diligence will always be required after tests performed to verify compliance with Registered Generator Performance Standards. Depending on the nature of the testing being performed, this stage will likely vary significantly on a case-by-case basis and will be negotiated as part of the development of a GPS Test Procedure. Minor testing that is witnessed by AEMO or the Network Operator has the potential to have an instant approval, but this will always be assessed with appropriate PSSR considerations. "As soon as practicable" has been added to this paragraph to provide certainty to a Market participant that there will be no unnecessary delays
2.4.9	The scope of testing and rectification could be beyond a 3-month timeframe. Instead of stipulating a 3-month timeframe, we consider it better that the timeframe be as negotiated before the Market Participant and AEMO, and approached on a case-by-case basis.	This 3-month period begins after the completion of all testing – no additional testing or rectification should be occurring during this time. AEMO considers that 3 months is a reasonable period to finalise reporting of the outcome of testing, noting that this paragraph already includes an ability to change this timeline.
3.4.1(a)	We suggest that an interval-based approach should not be mandatory, and the approach be by agreement between	AEMO considers that an interval-based approach is appropriate, given that the WEM Rules contains an ongoing obligation that "A Market Participant responsible for a

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	Market Participant and AEMO. For example, event-based, post-modification.	Transmission Connected Generating System must… monitor its compliance with the Registered Generator Performance Standards for the Transmission Connected Generating System" (WEM Rules 3A.6.1(a)) Note that the reporting interval for this requirement is negotiable, some guidance is provided in Appendix C. "…approved by AEMO" added to make it clearer that this is negotiable." Event based monitoring may form part of a Generator Monitoring Plan. Modifications should be addressed separately in accordance with Relevant Generator Modification requirements (ref. WEM Rules 3A.13, 3A.14).
3.6.5	This clause requires that Market Participants perform substantive compliance verification testing. New High-Speed Data recorders would capture typical grid electrical parameters but may not capture all parameters usually logged in a performance verification testing process. Compliance with 3.6.5 is likely to require significant additional financial, technical and analytical resources and time for Market Participants.	This paragraph provides principles that a Market Participant must consider and incorporate for the development of a Generator Monitoring Plan, noting that the WEM Rules requires that a Market Participant must "…monitor its compliance with the Registered Generator Performance Standards for the Transmission Connected Generating System" (WEM Rules 3A.6.1(a)). A Market Participant may propose a variety of monitoring and/or testing activities to achieve these requirements, providing that the outcome is a conclusive assessment of the compliance status of the Transmission Connected Generating System. AEMO acknowledges that Existing Transmission Connected Generating Systems may have additional challenges when implementing these requirements, note that paragraph 3.6.8 gives additional flexibility to testing and monitoring methods used for these facilities.
3.6.9	If additional testing outside of outage maintenance is required to be conducted, this will likely result in increased workload and costs for Market Participants. As such, Synergy's preference is for Market Participants to be permitted to align and manage testing with their outages schedule.	Paragraph 3.6.9 describes that testing must be conducted via an approved Commissioning Test Plan. AEMO supports aligning testing with suitable existing scheduled outages, providing that testing is performed at a suitable frequency. This would be negotiated as part of the development of a Generator Monitoring Plan.
3.7 and 3.8	Requiring a separate GMP Compliance Report for each Generating Unit after a fixed time interval will increase compliance responsibilities for Market Participants. This will likely result in Participants bearing significant additional compliance costs to procure technical and analytical resources to analyse Grid events and prepare reports for AEMO. We suggest that AEMO reconsider this requirement.	AEMO does not believe these paragraphs require a separate Generator Monitoring Plan for separate Generating Units. Reporting for Generator Monitoring Plans must be conducted at agreed intervals and must conclusively assess the compliance status of the Transmission Connected Generating System.

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3.8.2	Where evidence of compliance is based on event analysis (such as frequency/voltage excursion, major modification, plant trip), a lack of relevant events during the compliance reporting period should be deemed as adequate and not requiring further investigation through alternative means such as testing.	A Generator Monitoring Plan must include a verification mechanism that supports the conclusive establishment of a compliance status, this is agreed at the time of the approval of a Generator Monitoring Plan. Lack of evidence of non-compliance does not automatically deem a Transmission Connected Generating System to be compliant, however provision exists for AEMO to approve lack of verification where appropriate, refer to paragraph 3.6.5(q). Paragraph 3.8.3 of this Procedure also includes a provision for items that cannot reasonably be verified by testing, monitoring or post event analysis.
3.9.3	We suggest an additional factor is included in this list: alignment with the Market Participant's maintenance outage schedules for its generators.	AEMO supports the alignment of the frequency of obtaining evidence of compliance with outages scheduled for other purposes, this is covered in Paragraph 3.9.3 (a) – (d), noting that AEMO would expect that maintenance is already being performed in alignment with equipment manufacturer's advice. Note also that a reasonable frequency of obtaining evidence must still be achieved in accordance with paragraph 3.9.3(e).
5.1.4	This clause could expose Market Participants to obligations resulting from Network disturbances during a compliance testing process, which Participants may not be aware of at the time. We suggest that the responsibility rests with the Network Operator or AEMO.	Upon further consideration, this paragraph has been removed as it does not add anything that isn't directly addressed in the WEM Rules and associated WEM Procedures about Market Participant obligations. Real time network or system disturbances will continue to be managed by AEMO and the Network Operator.
Appendix B, A12.2	We suggest that additional possible triggers include a Relevant Generator Modification or a non-compliance or rectification. We also suggest that the requirement to demonstrate intent to undertake tests be conditional on the outage scenario and not compulsory. Our preference is that unit stated performance at the ambient temperature is adequate proof.	Relevant Generator Modifications, Non-compliance reporting and Rectifications Plans are considered separately in accordance with WEM Rules 3A.9, 3A.11, 3A.12, 3A.13 and 3A.14. AEMO would expect that an intent demonstrated to perform tests under agreed conditions would be honoured by a Market Participant, however scope already exists within paragraphs 2.3.6(p) and 3.6.5(q) to justify lack of verification of compliance if testing is unable to be completed.
Appendix B, A12.3	We suggest adding that the maximum/minimum constraints should be the grid's capability to absorb or supply quantities to enable the test.	AEMO would not expect a Transmission Connected Generating System to attempt to supply or absorb Reactive Power beyond the capability of the power system, however an expectation exists that testing would be scheduled at a time where sufficient evidence of compliance can be obtained. Note wording in this section which states: "The selected Active Power levels must be sufficient to reasonably establish the Reactive Power Capability in both supply and absorb regions on the Reactive Power Capability curve."

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Appendix B, A12.5	Suggest that performance of this test can be consequential (for example, if there is a load rejection) and should employ offline testing methods.	Offline testing can be utilised where appropriate, however these tests would typically be performed online to be effective, particularly testing requiring consideration of Active Power dispatch levels.
Appendix B, A12.7, A12.8, A12.11	We consider verification through secondary injection to be much safer and practical.	Secondary injection tests may be able to be accepted in a GPS Test Procedure if a Market Participant can propose a suitable test. This would be determined during the negotiation of a proposed GPS Test Procedure.
Appendix B, A12.16	We suggest that testing end-to-end communication delay should be a post-modification process.	AEMO agrees. Note that Appendix B testing requirements would typically form part of a GPS Test Procedure for a new or modified Transmission Connected Generating System, AEMO would generally not expect these tests to form part of a Generator Monitoring Plan.
Appendix B, A12.17	The frequency of obtaining evidence of compliance with GMP in terms of model revalidation should not be specified in years but should be requirement-based.	A Market Participant must be able to comply with Registered Generator Performance Standards relating to A12.17 as part of a Generator Monitoring Plan, note that Appendix B testing requirements would typically form part of a GPS Test Procedure for a new or modified Transmission Connected Generating System, AEMO would not expect these tests to form part of a Generator Monitoring Plan. A Generator Monitoring Plan would more likely incorporate requirements for A12.7 from Appendix C (Monitoring Requirements). Paragraph 3.6.3(c) has been extended to make this clearer.
Appendix C, various Technical Requirements	Our preference is that suggested monitoring frequency is not stipulated, and instead is as negotiated between the Market Participant and AEMO.	Monitoring frequencies provided here are labelled as "Suggested monitoring frequencies' and as such should only be used as a guide. Actual monitoring frequency can differ and would be determined through negotiation between the Market Participant and AEMO.
Appendix D, A12.4 and A12.5	We note that Monitoring Data would only be available if such events (e.g. rate of change, rise time, settling time) occur and are captured by High Speed Data Recorders.	Agreed. If suitable Monitoring Data is not available, other compliance verification mechanisms may be used to demonstrate compliance.