



Consultation on Generator Performance Standards (GPS) Template

Information Paper

Published: 28 February 2023

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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 Information Paper commences the consultation process conducted by AEMO to notify interested parties of changes (Changes) which are proposed to AEMO's Generator Performance Standards (GPS) Template to account for National Electricity Rules (NER) amendments by for the purposes of the:

- National Electricity Amendment (Integrating energy storage systems into the NEM) Rule 2021 No. 13 (IESS Rule)¹, and
- National Electricity Amendment (Efficient management of system strength on the power system) Rule 2021 No. 11 (EMSS Rule)².

AEMO notes that the access standards underlying the GPS Template may be subject to further amendment as a result of a number of other ongoing reviews or consultation processes. The GPS Template changes currently proposed by AEMO focus only on the standards introduced or amended by the EMSS Rule and IESS Rule, and other minor and administrative changes.

In summary, the substantive proposed changes are to:

- Incorporate two new access standards for short circuit ratio and voltage phase angle shift added by the EMSS Rule from 15 March 2023.
- Adjust the form of access standards in NER schedule 5.2 to reflect their application to relevant plant incorporating bidirectional units, that is taken to be an integrated resource system under the IESS Rule from 15 March 2023.

AEMO has prepared this Information Paper to inform stakeholders of the proposed changes and facilitate their feedback.

Appendix A is a list of active reviews affecting access standards.

¹ See <https://www.aemc.gov.au/rule-changes/integrating-energy-storage-systems-nem>

² See <https://www.aemc.gov.au/rule-changes/efficient-management-system-strength-power-system>

1. Stakeholder consultation process

AEMO is consulting on changes proposed to the GPS Template as a result of the IESS Rule and EMSS Rule.

While there is no requirement for AEMO to establish a template to record performance standards, AEMO has done so for many years in order to standardise the form in which GPS are recorded and registered. AEMO is therefore consulting on these changes both for awareness and feedback from network service providers (NSPs) and connection applicants or generators involved in the negotiation of GPS.

AEMO's indicative timeline for consultation is as follows:

Deliverable	Indicative date
Change marked template published for feedback	28 February 2023
Feedback due on change marked template	7 March 2023
Final template published	15 March 2023

AEMO invites stakeholders to provide written feedback on the proposed amendments to the GPS Template, in particular:

- Whether the proposed changes appropriately reflect the updates necessary as a result of the IESS and EMSS Rules.
- Any suggested alternative drafting, noting that the scope of this consultation is limited to the IESS and EMSS changes, and minor drafting corrections.

Stakeholders can request a meeting with AEMO to discuss any issues in respect of these changes, via email prior to the closing date for feedback:

2. Background

2.1. Efficient management of system strength on the power system

On 21 October 2021, the Australian Energy Market Commission (AEMC) made its final determination on the EMSS Rule, to deliver an evolved framework for system strength. The EMSS Rule has three key components, with only the last being relevant for the GPS Template:

1. A requirement for AEMO to specify revised system strength requirements for system strength nodes, forming the basis for a new power system standard and corresponding transmission network performance requirements for system strength. This commenced on 1 December 2022.
2. Revised system strength connection options with a new system strength charging mechanism. This allows connecting parties to have the choice of paying a system strength charge or providing their own system strength ('remediating').
3. Two new minimum access standards for relevant generators, loads and market network service providers. These will apply from 15 March 2023. A new short circuit ratio (SCR) standard in all three NER access standard schedules (5.2, 5.3 and 5.3a) will require relevant plant to remain connected and operate stably at a short circuit ratio (SCR) of 3.0 or lower. A minimum access standard for voltage phase angle shift limits has also been added to NER schedule 5.2,

applicable to asynchronous generation. In schedule 5.2, the new standards are in clauses S5.2.5.15 and S5.2.5.16 respectively.

2.2. Integrating energy storage systems into the NEM

On 2 December 2021, the AEMC made its final determination on the IESS Rule, to integrate storage and hybrid systems into the National Electricity Market (NEM). The IESS Rule takes a significant step toward a technology agnostic two-way market model for the NEM. These changes anticipate, and help prepare the NEM for, future steps envisaged through the Energy Security Board's (ESB's) Post-2025 Market Design initiative.

Key new concepts relevant for the GPS include:

- A new participant category: **Integrated Resource Provider (IRP)**.
- A new unit classification: **bidirectional unit (BDU)**.
- A new collective term for generating units and bidirectional units: **production unit (PU)**.
- A new system type: **integrated resource system (IRS)**.

The full implementation of the IESS Rule will occur on 3 June 2024. However, the rule changes made to recognise the capability of bidirectional units in the schedule 5.2 access standards will apply from 15 March 2023 (the same date as the new EMSS access standards). In accordance with the IESS Rule (NER 11.145.13), the revised access standards will apply:

- To plant that is or will be an integrated resource system, comprising one or more BDUs that will be classified as a generating unit under the current rules.
- Where the connection enquiry or NER 5.3.9 submission is made on or after 15 March 2023.

2.3. Other change processes

There are a number of active reviews and consultations underway that will, if they result in NER changes, require further amendment of the GPS Template in due course. These are listed in Appendix A for information, but cannot be considered as part of the current template amendments.

3. Drafting for proposed changes

To assist stakeholders, AEMO has published the draft change-marked version of the GPS Template incorporating the amendments AEMO considers necessary to reflect the EMSS Rule and the IESS Rule.

AEMO invites stakeholders to :

- provide feedback and comments on this Information Paper, as well as the accompanying change-marked version of the GPS Template; and
- identify any unintended adverse consequences of the Changes.

Written feedback on the draft GPS Template is invited by **5pm AEST Tuesday 7 March 2023**, by email: contact.connections@aemo.com.au.

Appendix A. List of active reviews affecting access standards

Initiatives & Developments	Interdependencies and considerations
AEMO review of technical requirements for connection³ (NER 5.2.6A)	AEMO is conducting its first 5-yearly review of the technical requirements for connection (access standards) in NER schedules 5.2, 5.3 and 5.3a under NER 5.2.6A. The final report is scheduled for Q4, 2023 and will recommend NER changes to address issues identified during the review.
AEMC Rule Change – Efficient reactive current Access Standard for inverter-based resources (ERC0272)⁴	The AEMC has recently published its draft determination on this rule change proposal, which is focused on the minimum access standards under NER S5.2.5.5 by specifying the nature of the reactive current response that inverter-connected generators must provide in response to a fault.
AEMC Reliability Panel Review – Frequency Operation Standard (FOS) Review 2022 (REL0084)⁵	With the FOS review due for completion by April 2023, the Reliability Panel has been investigating revised FOS settings for implementation from October 2023 given the ongoing energy market transformation, as conventional synchronous generation leaves the market and inverter-based technologies enter the NEM. Changes to, among other things, the rate of change of frequency and frequency standards settings for contingency events, may impact the access standards.
AEMO S5.2.5.10 guideline for Asynchronous Generating Systems⁶	On the basis of stakeholder feedback that there is uncertainty regarding the requirements of clause S5.2.5.10 “Protection to trip for unstable operation” and the requirements to the Power System Stability Guidelines (PSSG). AEMO is seeking to develop and communicate a consistent understanding via a new S5.2.5.10 guideline and amendment t of the PSSG. AEMO’s review under NER 5.2.6A (above) will consider any recommended amendments to NER S5.2.5.10.
AEMO Engineering Framework⁷	AEMO’s Engineering Framework aims to define the range of operational, technical requirements to prepare the NEM for future operating conditions including for 100% instantaneous penetration of renewables. It has identified gaps between current and future operating conditions that have implications for technical requirements or standards. Relevant initiatives include a review of treatment of grid-forming inverters in the connection process under the current NER technical requirements, and an initiative to develop a voluntary specification.
Connections Reform Initiative (CRI) roadmap	AEMO, the CEC and NSPs are collaborating to progress a suite of reforms to connections processes. This work will reduce connection time and costs arising from the complexities of the NEM transformation. The CRI includes workstreams to: <ul style="list-style-type: none"> • Streamline the end-to-end connection process • Support formation fidelity and quality of data and models provided by Original Equipment Manufacturers (OEMs) • Identify and implement opportunities to streamline the process followed by a proponent proposing to alter an existing generating system • Increase investment certainty for a connection applicant seeking to register their plant to the NEM. Reforms may take effect through amendments to internal procedures, Guidelines and/or the NER.
Renewable Energy Zone (REZ) development	The fast-paced development of REZs, especially in New South Wales (NSW), Victoria and Queensland, may result in amendments to the current connections framework for those networks. For example, the NSW REZ connections process included the development of mandatory access standards. The consultation feedback received by Energy Corporation of NSW will also be considered in AEMO’s review under NER 5.2.6A (above).

³ See <https://aemo.com.au/consultations/current-and-closed-consultations/aemo-review-of-technical-requirements-for-connection>

⁴ See <https://www.aemc.gov.au/rule-changes/efficient-reactive-current-access-standards-inverter-based-resources>.

⁵ See <https://www.aemc.gov.au/market-reviews-advice/review-frequency-operating-standard-2022>.

⁶ See <https://aemo.com.au/consultations/current-and-closed-consultations/ner-s52510-guideline-consultation>.

⁷ See <https://aemo.com.au/en/initiatives/major-programs/engineering-framework>.

