Frequently Asked Questions

FAQ

This Frequently Asked Questions (FAQ) document provides additional guidance to support the interpretation and application of the Interim Guideline for connection of Inverter Based Loads (IBLs) (Interim Guideline)[1]. It addresses common questions relating to model, study, and performance requirements.

This FAQ should be read in conjunction with the Interim Guideline for connection of IBLs and the relevant National Electricity Rules (NER) provisions. In the event of any inconsistency, the NER prevails.

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[1] At https://www.aemo.com.au/-/media/files/stakeholder_consultation/consultations/nem-consultations/2026/interim-guideline-for-connection-of-inverter-based-loads/interim-guideline-for-connection-of-inverter-based-loads.pdf?rev=b83a565c50614791ac702e3fbb1cb65b&sc_lang=en.

Model Requirements

Can a project developer progress to a NER 5.3.4A response or a connection agreement without a site-specific or OEM-specific model?

If a site-specific model is not available at the time of the connection application, the Network Service Provider (NSP) and AEMO may assess the impact of the plant with a generic model on condition that a site-specific model will be provided prior to the energisation. In such cases, a generic IBL model including proposed protection functions may be provided in both Root Mean Square (RMS) and Electromagnetic Transient (EMT) formats for all IBLs.

For large inverter based loads (LIBLs) (e.g., ≥ 30 MW), the proponent will be required to confirm that an Original Equipment Manufacturer (OEM) site-specific EMT model is under development with a stated delivery time. This will need to be agreed with the NSP and AEMO. An RMS model must also be developed incorporating site specific protection settings and functional details. The RMS model may incorporate generic components if the NSP and AEMO agree that performance can be adequately represented.

For IBLs (< 30 MW), the NSP may require an RMS model incorporating site specific protection settings and functional details similar to that required for LIBLs. If required, this RMS model must be submitted prior to energisation.

To allow time to assess the model, provision of the site-specific models six-months ahead of energisation is required.

At commissioning or post commissioning stage, any models required prior to energisation need to be validated. Model validation procedures will vary depending on the design of the installed equipment and should be determined in consultation with AEMO and the NSP.

Can AEMO support development of models?

Yes. AEMO can provide optional support to OEMs in model development through the Early Assessment Framework (EAF)[2], if requested, as IBL model maturity is expected to initially vary substantially across OEMs.

This will enable OEMs to identify any model issue at an early stage and independently validate their models before entering project specific connection contracts.

Study Requirements

What studies should be submitted as part of an IBL connection application?

A connection study report to be submitted by a proponent with an IBL connection application should contain results from RMS and EMT single load infinite bus (SLIB) studies, wide area load flow studies and power quality studies. The scope shall be developed in consultation with the NSP and AEMO and shall include demonstration of the load's compliance with the relevant access standards and capability of the network to supply the load.

SLIB studies to be submitted by a proponent should represent performance of the IBL in response to voltage and frequency disturbances at the connection point, including voltage and frequency protection behaviour and fault ride

[2] At https://www.aemo.com.au/energy-systems/electricity/national-electricity-market-nem/participate-in-the-market/network-connections/transmission-and-distribution-in-the-nem/early-assessment-framework.

through response. NEM load flow studies should show impact of the IBL on network thermal loading and steady state system voltage stability (QV or PV analysis).

Benchmarking between RMS and EMT models should be included based on SLIB studies representing voltage and frequency disturbances and balanced faults.

Performance Requirements

Do IBL connections require telemetry and monitoring?

AEMO acknowledges that telemetry, including Supervisory Control and Data Acquisition (SCADA), is not an explicit access standard requirement for unregistered IBLs. However, as the volume of large data centres is rapidly growing, maintaining visibility of these facilities is critical to maintaining system security.

For LIBLs, the telemetry and monitoring requirements in the Interim Guideline are based on the expectation that the NSP will require telemetry, possibly in the form of SCADA, as part of the LIBL connection agreement. Please refer to Appendix A of the Interim Guideline. If the IBL is registered, AEMO will require SCADA for active and reactive power.

For IBLs connected to the distribution network, a Distribution Network Service Provider (DNSP) or Distribution System Operator (DSO) is expected to require telemetry for real-time operation, to maintain situational awareness of all equipment connected to their network. As mentioned in the paragraph above, if the IBL is registered, AEMO will require a subset of this data, specifically MW and MVA provided as SCADA. Please refer to Appendix B of the Interim Guideline for further detail.

On July 2026, AEMO submitted Operational integration and visibility of LIBLs loads rule change (the 'OIV rule change') request[3], which proposes consistent and proportionate operational monitoring and communication requirements for LIBLs within the NER. NER amendments on monitoring and communication requirements are subject to the AEMC's rule change process, noting that all registered IBLs will require telemetry and SCADA links to the Transmission Network Service Provider (TNSP) and AEMO.

Is it expected that IBL proponents who submitted their application ahead of AEMC's Improving the NEM access standards – Package 2 Final Rule comply with the new technical standards?

On 12 November 2026, the AEMC published the Final Rule for the Improving the NEM access standards – Package 2 rule change (the 'Package 2 rule change'). This rule change introduced new access standards for inverter based loads and included transitional arrangements to address which access standards should apply for connections in progress at commencement of the new rule.

The access standards that apply to existing connection applications or alteration proposals will depend on the stage the project has reached in the connection process on 12 November 2026:

- **For connection enquiries and applications where technical requirements have not been confirmed**: The new access standards introduced through the Package 2 rule change apply to existing connection enquiries submitted under NER 5.3.2 or 5.3A.5, and applications to connect or alteration proposals where

[3] At https://www.aemc.gov.au/rule-changes/operational-integration-and-visibility-large-inverter-based-loads.

confirmation of acceptance has not been received under NER 5.3.4A for all relevant proposed negotiated access standards.

- **For applications where technical requirements have been confirmed**: The previous access standards may continue to apply where confirmation of acceptance has been received under NER 5.3.4A for all relevant proposed negotiated access standards but an offer to connect has not yet been issued, or confirmation from NSP and AEMO for an alteration proposal has not yet been received. The new access standards apply from 12 May 2027 if a connection agreement has not been executed or if the NSP has not advised the participant that the NSP and AEMO are satisfied under NER 5.3.10 or 5.3.13 for an alteration proposal by that date. Applicants may also elect to adopt some or all of the new access standards earlier.
- **For existing offers to connect**: Where an offer to connect has been issued under NER 5.3.6 or 5.3A.10 before commencement, but a connection agreement has not been executed, the existing access standards continue to apply.
- **For existing connection agreements**: The previous access standards continue to apply to existing connection agreements. However, any performance standards amended after 12 November 2026 must comply with the new access standards, subject to the applicable transitional arrangements.

Applicants should consult with the NSP and AEMO to ensure compliance with the relevant access standards.

Do IBL connections require any testing to satisfy the criteria outlined in current DMAT guideline?

AEMO will review the current Dynamic Model Acceptance Test (DMAT) guideline to determine whether separate criteria need to be introduced for IBL connections. In the interim, a reduced set of DMAT tests may be requested

Do IBLs need to be included in under frequency load shedding (UFLS) schemes?

Schedule 5.3 Participants, including IBLs, greater than 10 MW are already required to be included in under-frequency load shedding (UFLS) under NER S5.3.10. Where an IBL is included in the UFLS scheme, tripping in accordance with UFLS requirements does not constitute a breach of frequency ride through requirements.

Registration Requirements

AEMO is currently reviewing the Guide to Registration Exemptions and Production Unit Classifications (REPUC)[4], including registration requirements for back-up generation and storage at load facilities, and is actively engaging with stakeholders to co-design this review.

The following advice is given on an interim basis. Proponents are encouraged to discuss registration requirements for their facility when planning their connection.

Does an uninterruptible power supply (UPS) system require registration or application for registration exemption?

The NER defines a ‘UPS’ as an electrical system that is:

- designed and operated primarily to maintain continuity of supply to a connected load, including when the normal supply to that load is interrupted or is outside specified operating limits; and

[4] At https://www.aemo.com.au/consultations/current-and-closed-consultations/guide-to-registration-exemptions-and-production-unit-classifications.

- not designed or intended to export active power to the grid through the connection point.

If the UPS meets this definition, it is considered to be part of the load facility and therefore is not required to be registered as a bi-directional unit, or apply for registration exemption. It must comply with Schedule 5.3 technical requirements rather than Schedule 5.2.

AEMO's update to the REPUC Guide will provide further guidance on the registration and exemption treatment of UPS arrangements, consistent with the NER definition introduced under the Package 2 rule change.

Does generation located at an IBL facility require registration or application for registration exemption?

Generation co-located at an IBL facility may need to be registered or require registration exemption depending on its connection and operational arrangements. Such generation may include any combination of the following (the list is not exhaustive):

- synchronous generation, typically diesel or gas fired
- asynchronous generation, typically wind or solar powered
- additional battery energy storage system (BESS) that is not part of the UPS[5].

Co-located generation installed for back-up purposes does not require registration or registration exemption where it meets the following conditions:

- The back-up generation is used solely for maintaining continuous energy supply to load devices within the same facility.
- The change-over of supply from grid to back-up and back-up to grid is in a break-before-make switching sequence that does not include any period during which the back-up generation operates in parallel with the grid.
- The back-up generation does not operate in parallel with the grid in any other circumstances.

If any of the above conditions are not met, the back-up generation will require registration, or the proponent will need to apply for registration exemption.

AEMO will assess a registration exemption application for back-up generation in accordance with the REPUC Guide.

A key consideration for registration exemption is operation of the back-up generation in parallel with the grid. For example, where change-over of supply from grid to back-up or back-up to grid is in a make-before-break switching sequence, exemption is more likely to be granted where operation in parallel with the grid is minimised.

AEMO may impose exemption conditions on back-up generation where AEMO considers it reasonably necessary. For example, simulation models may be required for back-up generation to demonstrate secure operation in parallel with the grid if this is to occur for any period. The REPUC includes further details of exemption conditions.

How will generation co-located with IBL be registered if not exempted?

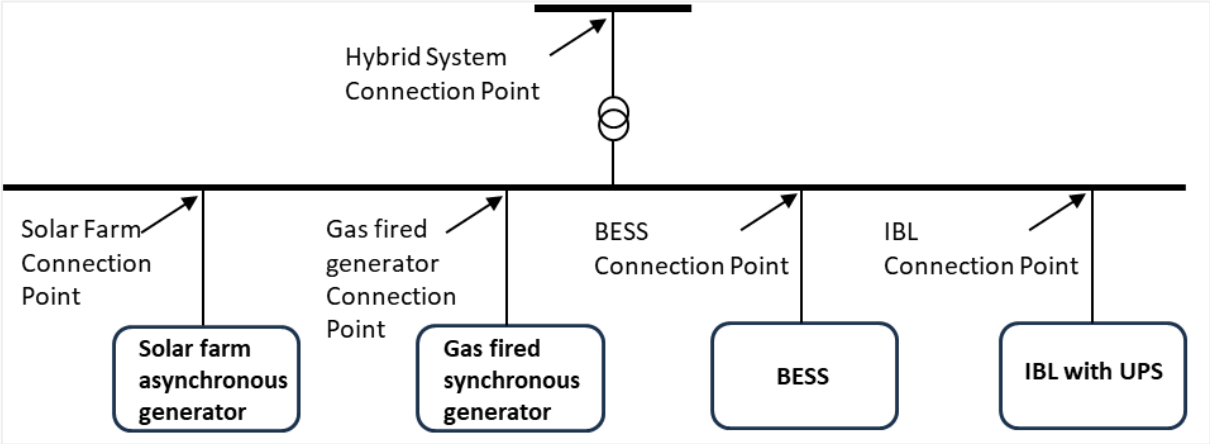
Co-located generation not meeting exemption requirements will need to be registered with the IBL as an integrated resource system (also referred to as a hybrid system). Schedule 5.3 requirements shall apply to the IBL and

[5] The additional BESS would be separately controllable and connected at a separate location within the IBL facility's reticulation network.

Schedule 5.2 requirements shall apply to the generation at their respective connection points within the facility's reticulation network.

A possible hybrid connection arrangement with IBL, BESS, synchronous and asynchronous generation is illustrated in Figure 1 below.

Figure 1 Possible hybrid connection arrangements (IBL + BESS + asynchronous generation)



Does the facility need to register as a market customer?

No. Registration of IBLs as market customers is not a requirement under the NER, if they elect to be a retail customer. However, the Package 2 rule change extended AEMO's requirement to establish and maintain a formal register of the performance standards to all Schedule 5 Participants under NER 4.14(n).

AEMC is also progressing the OIV rule change, which considers introducing registration requirements for LIBLs to support operational visibility and power system security. Any new registration obligations are subject to the AEMC's rule change process.

Commissioning Requirements (NER 5.8)

AEMO's Commissioning Guideline, published in January 2026, establishes a principal-based framework for commissioning generating systems, integrated resource systems and synchronous condensers.

AEMO intends to adopt similar principles for IBLs, with further work commencing in January 2027. This will include consideration of fit for purpose testing requirements, coordination with NSPs, and appropriate processes to demonstrate compliance with the applicable performance requirements and model validation.

The following advice is given on an interim basis.

What commissioning tests are required for IBLs?

NER 5.8 commissioning requirements apply to new or replacement Schedule 5.3 plant (including IBL) with a nameplate rating of at least 30 MW or 30 MVA, except to the extent that AEMO determines otherwise under NER 5.8.1A.

The commissioning scope will depend on the facility's design, connection arrangements and applicable performance requirements. Depending on the facility, commissioning may include:

- backup generation and changeover testing including Automatic Transfer switch operation
- load shedding and ramp-rate performance
- capacitor bank and relevant network element switching
- harmonic monitoring, and
- SCADA, control and communications functionality.

Applicants should engage early with the NSP, and AEMO where applicable, to agree the commissioning plan, including the scope of testing, testing methods and acceptance criteria.

How should compliance with performance standards be demonstrated during commissioning?

Commissioning should demonstrate that the facility performs in accordance with its applicable performance standards and connection agreement.

The appropriate testing methods will depend on the facility's design and the performance standards being demonstrated. These may include physical testing, signal injection, simulations or other suitable methods, as agreed with the NSP and AEMO, where applicable.

For disturbance response and ride-through capability, the agreed approach should provide appropriate evidence of the facility's performance, taking into account practical and safety constraints.

Alteration Process (NER 5.3.12)

How does NER 5.3.12 apply where a connection is developed in stages?

NER 5.3.12 applies when a project is developed in stages and equipment that differs from the plant assessed or approved under NER 5.3.4A is introduced.

For example, a data centre project has received an NER 5.3.4A letter for a total capacity of 150 MW, to be deployed in three 50 MW stages. One OEM is proposed to supply UPS equipment for all three stages. NER 5.3.4A approval is based on modelling of all three stages with UPSs from this OEM. The first stage is constructed using this OEM as planned. Subsequently, a different UPS OEM is selected for the second stage. The second stage requires assessment under NER 5.3.12 because of the change in OEM for the second stage.

What information should be included in a submission under NER 5.3.12(b)?

When preparing an alteration submission under NER 5.3.12(b), proponent must include:

- Details of proposed alteration, which may include:
    - alterations to any equipment or associated protection and control systems
    - addition or removal of equipment
    - changes to configuration and settings
    - firmware updates.



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- The reason for the proposed alteration.
- The stage of the connection process at which the alteration is proposed, specifying whether it is post execution of the connection agreement, commissioning stage, or operational stage.
- Supporting documentation, which may include:
    - Information from the OEM such as firmware release notes, or OEM confirmation.
    - Setting registers indicating the existing and proposed settings.
    - A benchmarking report showing the performance of the plant with and without the proposed change.
- An assessment of the proposed alteration's impacts, considering the following matters:
    - Performance of the plant that may be impacted relative to any of the technical requirements set out in Schedule 5.3.
    - Anticipated general system strength impact.
    - Anticipated adverse impact on network capability, power system security, quality or reliability of supply, inter-regional power transfer capability or the use of the network by another user.
    - Where NER 5.3.12(b)(4) does not apply, proponent should provide the proposed system strength remediation scheme or an election to pay the system strength charge.
- Provision on models, such as PSS®E and PSCAD™/EMTDC™ model updates.

Need more information?

For more information, see AEMO's Interim Guideline for Connection of Inverter Based Loads, and related guidance materials available on AEMO's website.

For enquiries about the Interim Guideline please contact AEMO's Onboarding and Connections team on contact.connections@aemo.com.au

This FAQ provides general guidance only and should be read alongside the Interim Guideline and the relevant provisions of the NER. In the event of any inconsistency, the NER prevails.