



SMA Australia Pty. Ltd.
ABN: 44 127 198 761
Level 1, 213 Miller Street
North Sydney NSW 2060
Tel.: +61 1800 SMA AUS
www.SMA-Australia.com.au

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Daniel Westerman
CEO and Managing Director
Australian Energy Market Operator
Level 22, 530 Collins St, Melbourne 3000
E: futureenergy@aemo.com.au

Feedback on the AEMO Consultation Paper on Technical Requirements for 200kW to 5MW DER

Dear Daniel,

SMA-Australia welcomes the opportunity to provide feedback to the Australian Energy Market Operator (AEMO) Consultation Paper on Technical Requirements for 200kW to 5MW DER connections.

We strongly support AEMO's objective of ensuring that distributed energy resources (DER) will not adversely affect the security or reliability of the power system and that DER performance requirements support the integration of high levels of penetration of DER. We welcome the proposal to introduce standards for performance requirements for ride through, to assist with managing abnormal power system conditions and to manage the impact of rapid responses to market signals.

SMA-Australia supports the introduction of standards for DER systems in the 200 kW to 5 MW range. We agree that mandatory standards in this size range would minimise the need for case-by-case negotiations with distribution network service providers (DNSPs). The introduction of standards in this size range should enable higher penetration of renewables connecting to established parts of the grid. It is preferable to the current situation whereby DNSPs impose their own bespoke performance requirements and in some cases require grid modelling for connections in the 200 kW to 5 MW range.

We suggest the following recommendations, which we believe would improve the proposal:

- Aim for a unified set of requirements for DER in the 200kW to 5MW range, which satisfy the needs of AEMO and DNSPs. Individual DNSPs currently set their own performance requirements for DER connections in this size range. Moving toward a unified set of requirements will reduce the unnecessary costs that arise when DNSPs create bespoke rules and unique requirements.
- Consider the development of an Australian Guideline based on the EN 50549-2 technical requirements instead of IEC TS 62786-1. A Guideline based on EN 50549-2 will have all the desired benefits, without the likely delays and disadvantages of using IEC TS 62786, which is a proposed technical specification and is not yet fully approved.



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- Include recommendations for cyber security uplift, to help address the gap in cyber security regulation in the 200kW to 30MW size range.
- Apply power limits to net export capacity rather than generation capacity and relax the requirements where DNSPs already require supervisory control and data acquisition (SCADA) for the size range being considered.

SMA's position and recommendations are outlined in more detail in the attached submission.

I would be delighted to meet with you to discuss these and other matters of mutual interest to SMA and AEMO. Alternatively, we would be pleased to arrange a meeting between the relevant AEMO staff and SMA's experts on global standards for inverters in the 200kW to 5MW range.

Best regards,

A handwritten signature in black ink, appearing to read 'Doris Spielthener', with a long, sweeping horizontal line extending to the right.

Doris Spielthener
SMA Australia
Regional Manager APAC & Managing Director Australia & NZ



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Responses to questions raised in the Consultation Paper

Scope of the Technical Requirements

1. Has the scope of the prospective requirements for sub-5MW DER been clearly defined?

Yes, the scope outlined by AEMO is clear. However, it is unclear which of the suggestions from distribution network service providers (DNSPs) are within scope. For example, section 2.3.4 of the Consultation Paper notes that a portion of distributed energy resources (DER) connections are likely to include grid-forming (GFM) capabilities and that some DNSPs “are also exploring the possibilities for GFM technologies to support the local grid in abnormal power system conditions, including islanding of part of a distribution system”.

As the Consultation Paper notes, for GFM inverters consideration would need to be given to protection system design for low fault level conditions, and whether anti-islanding should apply. These design elements would affect the bulk supply system operation only if they impinge on the plant’s capability to ride through power system disturbances and there is some interaction between the plant and other plant that results in a cumulative impact.

It would be helpful for AEMO to state in its next report whether protection system design for low fault level conditions and anti-islanding are within the scope of AEMO’s considerations. If so, what are the GFM capabilities required from DER connections on distribution networks to satisfy AEMO’s needs in the bulk power system?

2. Is the reasoning behind including those focus areas for AEMO to consider specifying technical requirements (summarised in Section 2.4) clear and reasonable?

Yes.

3. Should AEMO also consider any or all the requirements outlined in Section 2.5 (identified of interest to DNSPs only)?

Yes. SMA urges AEMO and DNSPs to aim for a unified set of requirements for DER in the 200kW to 5MW range. To achieve that aim, the technical requirements need to meet the needs of AEMO and DNSPs.



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4. Should AEMO consider other requirements not outlined here?

Yes.

The Australian Energy Market Commission (AEMC) Draft Determination on cyber security roles and responsibilities proposes to confirm that AEMO plays four key roles in cyber security, namely:

- Cyber security incident coordinator,
- Supporting cyber preparedness and uplift,
- Examining cyber risks and providing advice to government and industry, and
- Facilitating the distribution of critical cyber security information to market participants.

In the sub-200kW range for consumer energy resources (CER), the Energy and Climate Change Ministerial Council (ECMC) has endorsed the development of a National CER Roadmap including a *Roadmap for CER Cyber Security*. SA Power Networks has also developed *Dynamic Exports Cyber Security Requirements* which are based on the relevant elements of the Australian Energy Sector Cyber Security Framework (AESCSF). In September 2024 SMA Australia successfully completed our assessment to demonstrate compliance with the SA Power Networks' *Dynamic Exports Cyber Security Requirements* and notified them accordingly.

Since August 2023, regulatory obligations under the Security of Critical Infrastructure (SOCl) Act have applied to power plants with more than 30MW generating capacity. The regulatory obligations require compliance with relevant parts of the AESCSF. Some of these obligations are passed through to inverter original equipment manufacturers (OEMs) in the form of contractual conditions that include cyber security clauses.

There is a gap in the regulatory framework for cyber security for DER systems in the 200kW to 30MW range.

We therefore urge AEMO to recommend the application of the AESCSF in the 200kW to 30MW range. In the absence of changes to the threshold specified in the SOCl Act, this could commence with a voluntary self-assessment process, like the SA Power Networks' *Dynamic Exports Cyber Security Requirements*.

Proposed Performance Requirements

5. Have the proposed performance requirements for sub-5MW DER been clearly defined?

Yes, they have been clearly defined. However, we disagree with the proposed 1.5MW power limitation. Where there is a power limitation, it should apply to net export capacity rather than generation capacity for DER systems with high voltage (HV) connection, low voltage (LV) loads and 230/400V IES.

Where remote monitoring (SCADA) and remote active power curtailment is required, there should not be any requirement for the proposed limit of 1.5 MW aggregate rated capacity as the impact on the bulk system could be managed by the DNSP via remote active power curtailment together with remote monitoring.



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6. What are stakeholder perspectives on the application of the proposed settings within the framework of IEC TC 62786-1 technical specification for sub-5 MW HV connected DER?

SMA strongly encourages AEMO to consider the application of EN 50549-2 in preference to the proposal to use the IEC TS 62786 series.

We anticipate that an Australian Guideline based on EN 50549-2 could be developed and implemented sooner and more smoothly than a guideline based on the IEC TS 62786 series.

IEC TS 62786-1 is a general technical specification for all DER and other parts of IEC TS 62786 establish the requirements for specific DER systems. Some parts, notably IEC TS 62786-2 which is the part for photovoltaics (PV) are not yet approved. This means that some technologies are not covered by the IEC TS 62786 series, either because consensus has not yet been reached or because standardisation is considered premature.

7. What are stakeholder perspectives on the application of AS/NZS 4777.1 and AS/NZS 4777.2 region-based requirements, for 230/400 V ac IES, less than 1.5 MW aggregate rated capacity, connected to the HV distribution network with LV load?

A limit for the applicability of AS/NZS 4777.1 and AS/NZS 4777.2 makes sense if remote monitoring and remote active power curtailment are not requested. We note that the threshold for remote monitoring (SCADA) and remote active power curtailment varies by DNSP and is required for systems exporting 200 kVA or more in some networks.

Where a power limitation is imposed for systems that are not required to install remote monitoring (SCADA) nor remote active power curtailment, it should apply to new export power rather than generation capacity. It is the net export that has an impact on the bulk power system.

Remote monitoring and remote active power curtailment could be mandatory for any sub-5MW DER according to the AEMO proposal, therefore any impact in the bulk power system could be handled by the DNSP through the remote monitoring and remote active power curtailment. Power limitation to 1.5 MW is not relevant where remote monitoring (SCADA) and remote active power curtailment is compulsory.

Where remote monitoring (SCADA) and remote power curtailment are required, there should not be any requirement for the proposed limit of 1.5MW aggregate rated capacity. Additionally, when SCADA is not required, the power limit should be according to the export capacity in the same way as proposed for the ramp rate limits. Section 2.3.2 states:

“Where the plant is part of a hybrid system, being any combination of load and generation and storage, where the plant is controlling the net import or export at the connection point, and the ramp rate limit is applied to the net import or export, but the plant may be permitted to have a higher individual ramp rate.”



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8. Should AEMO consider other references for its technical performance settings? For example, EN 50549-2:2019, which specifies the technical requirements for the protection functions and the operational capabilities for generating plant intended to operate in parallel with medium voltage distribution networks.

Yes. SMA recommends that the process should commence with an Australian Guideline based on the technical requirements for EN 50549-2:2019. There would be significant benefits from this approach, compared with the proposal to use IEC TS 62786 such as:

- EN 50549-2 is a mature standard whereas IEC TS 62786 is a proposed technical specification and some parts are pending approval.
- If IEC TS 62786-1 is aligned with AEMO's requirements, then EN 50549-2 will be similarly aligned.
- IEC TS 62786-1 contains general requirements, but the series completes specific requirements for each topology (e.g. IEC TS 62786-2 for PV, IEC TS 62786-3 for battery energy storage systems (BESS)).
- IEC TS 62786-2 is not yet approved.
- The 2023 addendum to EN 50549-2:2019 is very similar to IEC 62786-1, but it is specific to medium voltage (MV) connection and without any restriction to a specific topology of DER.
- An Australian Guideline based on the EN 50549-2 technical requirements could be developed sooner, while the international standards are either adopted or modified for Australia.

Options for Implementation

9. Is initially introducing the proposed recommended settings via a guideline with DNSPs the most effective approach?

Yes. An Australian Guideline would be the best way to introduce and align new requirements for DER soon. We recommend development of an Australian Guideline based on EN 50549-2. This could take effect in a short period while an Australian Standard is developed.

10. Should the recommended settings be established as an Australian Standard?

Yes. SMA would prefer a unified set of requirements for DER in the 200kW to 5MW range. Including the settings in an Australian Standard would be the best way to unify the requirements. Considering the time required to develop a new Australian Standard, an Australian Guideline could be helpful while the Australian Standard is developed.