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To:

Power System Security and Reliability Standards Review
Energy Policy WA
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Subject: Submission – PSSR Standards Review (SWIS)

Thanks for the opportunity to provide feedback on the PSSR Standards Review.

OffGrid WA designs and installs solar, battery and hybrid energy systems across regional and edge of grid parts of Western Australia, including areas of the SWIS where the network is electrically weak, has higher impedance, and where voltage behaviour can already be challenging. In these locations, inverter based systems and batteries are not just installed for customer savings, they are often part of how sites stay stable and operate reliably.

Our feedback comes from working directly with real systems on the ground, particularly mid-scale commercial and regional projects. We support strong technical standards for inverter-based resources. However, the rules also need to reflect how the grid actually behaves outside strong metropolitan network areas, and how solar and battery systems are already being used in practice.

The key themes from our perspective are:

- Recognising that the SWIS is not electrically uniform and that weak or edge of grid conditions are common in regional feeders
- Treating advanced battery and grid forming capable systems as part of the solution for system security, not only as a connection risk
- Making sure requirements are proportionate so mid-scale and regional projects are not forced into large power station style compliance processes.

The comments below are based on those practical operating conditions.

1. Weak and Edge of Grid Conditions Need to Be Recognised

The SWIS doesn't behave the same everywhere. In regional and fringe of network areas we regularly work on feeders with higher impedance, more voltage fluctuation and lower fault levels than what you'd see in strong metro parts of the grid.

In these areas, battery and inverter systems are often being installed not just for energy savings, but because sites need help with voltage behaviour, ride through events and general stability. From a practical point of view, these systems are already doing part of the job that the network would otherwise need to solve.

The consultation material discussing grid-forming and grid-following inverter performance and system strength behaviour highlights how inverter-based resources interact with fault level and grid strength conditions. In many regional parts of the SWIS, those "weak grid" conditions are not rare edge cases, they are the normal operating environment.

Because of this, the standards shouldn't assume strong grid conditions as the default. It would help if the framework clearly recognised weak or high impedance parts of the SWIS and allowed technically appropriate pathways for systems connecting in those locations.

The intent shouldn't be to lower standards, but to make sure systems that are actually supporting the network aren't treated only as a risk source under rules that assume a much stronger grid than what exists in practice.

2. Grid Forming Battery Systems Should Be Treated as System Assets

From what we see on real projects, advanced battery systems, particularly those capable of grid forming operation, are not just generation or storage devices. In weaker parts of the network they are often providing fast voltage support, stabilising frequency behaviour at site level, and helping loads ride through disturbances that would otherwise cause trips or operational issues.

The consultation material on inverter technical requirements recognises the different behaviour of grid-forming and grid-following inverters and their interaction with system strength and fault conditions. That direction makes sense. However, it is important that the framework clearly reflects that these systems can contribute positively to system security, not just be treated as equipment that must be tightly constrained to avoid risk.

In regional and edge of grid locations, batteries with advanced control capabilities can reduce the impact of disturbances and improve local power quality. In practice, we regularly see advanced battery inverter systems respond to voltage excursions, frequency deviations or instability events by temporarily separating the site from the grid and maintaining stable operation locally until network conditions recover. Once the upstream supply stabilises, the system automatically resynchronises and reconnects. From an operational point of view, this behaviour prevents nuisance trips, protects customer equipment and reduces the impact of disturbances on the local network.

We believe the standards should continue to set clear performance expectations, but also explicitly recognise the role of grid forming capable systems as contributors to system strength, voltage control and fast response.

3. Requirements Should Be Proportionate for Mid-Scale and Regional Systems

We support strong technical standards and recognise the need for inverter-based systems to meet appropriate performance levels. However, it is important that the level of modelling, protection study and compliance effort is proportionate to the size of the system and its actual impact on the wider network.

A lot of the discussion in the consultation around inverter behaviour, fault performance, protection coordination and system strength is clearly influenced by large power station and transmission-connected plant contexts. That makes sense at that scale. But many of the systems being installed across regional WA are mid-scale commercial, agricultural, tourism or community facilities. These are very different in system impact from a large generator.

If large power station style requirements are applied too broadly, this can quickly make otherwise beneficial solar and battery projects commercially unviable, particularly in regional areas where projects are already dealing with higher logistics and infrastructure costs.

The consultation material covering inverter performance and protection-related requirements shows how technically detailed these expectations are becoming. A tiered or scaled approach, with clear pathways for mid-scale and regional systems, would help ensure that standards remain robust while still being practical to implement.

The aim should be to manage real system risk, not to apply the same level of compliance burden to projects whose scale and network impact are materially different.

4. A Single, Clear Connection Standards Framework Will Help in Practice

Bringing connection standards into a more consistent and centralised framework is a positive step. From an installer and system integrator perspective, having requirements spread across different documents and rule sets can make interpretation difficult.

The move to align technical rule concepts and connection requirements within the ESM framework, as discussed in the consultation material, should help improve consistency across the system .

From a practical point of view, it would also help if the formal rules are supported by clear guidance notes and examples of how requirements are intended to be applied to different system types and scales.

5. Responsibility for System Strength Should Remain Clearly Defined

As inverter-based generation and storage increase across the SWIS, the way system strength is managed becomes more important.

The consultation material discussing system strength and inverter performance highlights how closely inverter behaviour is linked to fault level and grid strength conditions. In many regional and fringe areas of the SWIS, lower system strength is not the result of a single project, but of the underlying network configuration.

Clear delineation between network obligations and connection performance expectations will help ensure that projects are designed responsibly, while system wide strength issues continue to be addressed at the appropriate level.

6. Hybrid and Resilience Focused Systems Are Becoming Part of the SWIS Landscape

We are seeing increasing demand for systems that operate grid connected under normal conditions but are also capable of supporting local supply during disturbances or outages.



The direction of the consultation, particularly around inverter behaviour and system strength, reflects how power systems are becoming more dynamic and control-based. It would help if the framework explicitly recognises hybrid and resilience focused configurations as a legitimate and growing part of the system.

Closing

OffGrid WA supports the continued modernisation of the PSSR standards to reflect a power system with increasing levels of inverter-based generation and storage. A clear, consistent and technically robust framework is essential.

We appreciate the opportunity to provide input.

Kind regards,

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