30 January 2025

Australian Energy Market Commission
Level 15
60 Castlereagh Street
Sydney NSW 2000
Submitted online: www.aemc.gov.au

RE: Improving the NEM Access Standards (package 1)

About Shell Energy in Australia

Shell Energy is Shell's renewables and energy solutions business in Australia, helping its customers to decarbonise and reduce their environmental footprint. Shell Energy delivers business energy solutions and innovation across a portfolio of electricity, gas, environmental products and energy productivity for commercial and industrial customers, while our residential energy retailing business Powershop, acquired in 2022, serves households and small business customers in Australia.

As the second largest electricity provider to commercial and industrial businesses in Australia[1], Shell Energy offers integrated solutions and market-leading[2] customer satisfaction, built on industry expertise and personalised relationships. The company's generation assets include 662 megawatts of gas-fired peaking power stations in Western Australia and Queensland, supporting the transition to renewables, and the 120 megawatt Gangarri solar energy development in Queensland. Shell Energy also operates the 60MW Riverina Storage System 1 in NSW.

Shell Energy Australia Pty Ltd and its subsidiaries trade as Shell Energy, while Powershop Australia Pty Ltd trades as Powershop. Further information about Shell Energy and our operations can be found on our website here.

General Comments

Shell Energy acknowledges the substantial amount of work and consultation undertaken by AEMO and stakeholders in reviewing the access standards through AEMO's Access Standards Review process. Shell Energy participated in this process at a technical level and acknowledges AEMO's goal was not to form consensus but to make appropriate changes to the access standards that ensure that they meet the NEO.

Shell Energy supports this approach and welcomes the work undertaken to provide additional clarity to the access standards. For convenience, our responses to individual rule changes are provided in Table 1.

We are also in the process of drafting a Technical Reference which considers the main technical challenges we see for the connection of large quantities of inverter-based resources to the power system. We would be happy to provide this to the AEMC should it be of interest.

[1]By load, based on Shell Energy analysis of publicly available data.
[2] Utility Market Intelligence (UMI) survey of large commercial and industrial electricity customers of major electricity retailers, including ERM Power (now known as Shell Energy) by independent research company NTF Group in 2011-2021.

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Table 1: Shell Energy responses to summary of the Access Standard Rule changes

Rule Change Proposed	Shell Energy Response
5.1 NER S5.2.5.1 – Reactive power capability	Agree with the proposed change. Shell Energy believes that this will reduce the requirements for inverters with no reduction in providing voltage support to the system when needed.
Temperature Derating	Agree with the proposed change that allows for NAS for temperature derating
Amendments for compensating reactive power for auxiliary load	Agree with the proposed change that clarifies requirements on auxiliary load when the main plant is not operating
5.2 Simplifying standards for small connections	
The 30MW and 5 MW thresholds for small plant are to be revised so that small plant is assessed in relation to the size of the power system to which it is connected. *for a production system or synchronous condenser as one with a nameplate rating equal to or greater than 30 MW (or MVA as relevant) or, if lower, 5% of the largest credible contingency event defined in the frequency operating standards*	Shell Energy notes that this currently only appears to apply in Tasmania where the 30 MW threshold effectively reduces to 7 MW (because the largest contingency event is defined as the loss of 144 MW). We request that the AEMC provide more clarity around the requirement for these thresholds. We consider that a more useful approach would be to assess the possible impact that a small generator has on the system (at its connection point) and set the size limit accordingly.
5.3 NER S5.2.5.2 - Quality of electricity generated	
Removes reference to a defunct Australian Standard	Agree
5.4 NER S5.2.5.4 - Response to voltage disturbances	
5.4.1 Over-voltage requirements for medium voltage and lower connections	
Amend S5.2.5.4 to add an NAS provision as follows: • Applicable to connection at nominal voltage less than 66 kV with no automatic tap-changing transformer between the units and the connection point. • If NSP and AEMO agree, voltage variations can be measured at the electrically closest location with a nominal voltage of 66 kV or higher,	Agree

instead of the connection point. a location with nominal voltage higher than the connection point. Remove S5.2.5.4(c), which restricted negotiation of CUO capabilities below the AAS based on plant size.	
5.4.2 Continuous uninterrupted operation for over-voltages above 130%	
The proposed changes generally clarify the 130% over voltage requirement that is poorly defined and open ended in the existing rules.	Generally, agree with the proposed changes.
5.4.3 Clarifying CUO for moderate voltage disturbances	
Clarifies the intent of the rule which allows for some temporary change in output for voltage disturbances but requires power and reactive power to be maintained for +/- 10% voltage at the connection point	Agree
5.5 NER S5.2.5.5 - Response to disturbances following contingency events	
Clarifies the AAS ability to ride through 15 consecutive faults	Shell Energy believes further consideration is warranted on whether this rule meets the actual needs of the system and whether it should equally apply to both inverter connections and rotating machines. We believe that inverter plant can relatively easily comply, but rotating plant generally can't, due to the mechanical stresses that would be experienced by rotating plant. The very nature of a MFRT event indicates that something has impacted the network, and plants need to be able to proactively protect against such things as mechanical damage, transient voltages and unbalanced loading. A 20mS dead time to determine faults fall within most voltage transducers cycle time, which would affect the perceived fault duration. We believe that simulation of multiple events does not provide any real additional information than the simulation of a single event.
5.5.2 Refining compliance requirements for multiple fault ride-through requirements	Shell Energy believes that the proposed change is meant to capture the rotating plant limitations discussed above. We note that it is proposed that resolution should occur via dialogue between the AEMO, NSPs and the connection applicants. Historically this has been challenging for connection applicants, as such, we encourage

	the AEMC to undertake further consultation on the impacts and the potential need for flexibility for rotating plant.
5.5.3 Reduction of fault level below minimum for which the plant is tuned	
Requires the fault level at which the plant controls are tuned to be captured in the GPS.	Shell Energy supports the intent of this rule.
5.5.4 Active power recovery after a fault	
	Shell Energy does not support this proposed change.
5.5.5 Rise time, settling time and commencement time for reactive current injection	Shell Energy is not able to comment on the proposed amendments as they have not been provided.
5.5.6 Commencement of reactive current injection and clarity on reactive current injection location	
This attempts to clarify the requirements placed on reactive current injection during system disturbances such as external faults.	Shell Energy does not support the proposed change. We believe that low voltage reactive thresholds (LVRT) and high voltage reactive thresholds (HVRT) are difficult to clarify during dynamic system studies and can present timing challenges to registration. We believe that the requirements for how they can be set up are too onerous which leads to the likelihood of control system hunting behaviour. Shell Energy considers that the proposed amendments further reduce the range of settings that can be applied which may prevent studies from being successfully completed.
5.5.7 Consideration of unbalanced voltages and clarity on reactive current injection volume	
Attempts to clarify the response to unbalanced voltages	Shell Energy agrees with the intent of this proposed change but encourages the AEMC to seek further input from inverter experts to ensure the rules can be applied consistently.
5.5.8 Metallic conducting path	Agree with proposal to delete this clause
5.5.9 Reclassified contingency events [Standard – non fast track – amendment]	
	Shell Energy does not support this proposed change. While we agree with the intent of the proposed changes, we do not believe it would remove the inherent uncertainty. We encourage the AEMC to undertake further consultation on this issue.
5.6 NER S5.2.5.7 – Partial load rejection	
5.6.1 Application of minimum generation to energy storage systems	

Apply S5.2.5.7 only to synchronous generation.	Agree
5.6.2 Clarification of meaning of CUO for NER S5.2.5.7	Agree
5.7 NER S5.2.5.8 – Protection of generating systems from power system disturbances	
5.7.1 Emergency over-frequency response	Agree
5.7.2 Protection settings to maximise capability to ride through disturbances	
Widen protection settings to allow full plant capability	Shell Energy does not agree with this proposed change as it is unclear what the possible unintended consequences could be from operating plant well outside the required access conditions. Plant protection is set against machine capability which is then checked against NER requirements. If met, then AAS is gained and if not, MAS is required. Setting the protection against AAS may be detrimental to machine/plant safety and could void its insurance. Further consideration is required on how to balance asset protection while providing grid capability.
5.8 NER S5.2.5.10 – Protections to trip plant for unstable operation	Agree
5.9 NER S5.2.5.13 – Voltage and reactive power control	
5.9.1 Voltage control at unit level and slow setpoint change	Agree
5.9.2 Optimise power system performance over expected fault level (system impedance) range – Voltage control	Agree
5.9.3 Materiality threshold on settling time error band	Agree
5.9.4 Multiple modes of operation and treatment of voltage settling time for reactive power and power factor modes	Agree
5.9.5 Interaction with system strength services	Shell Energy does not support this proposed change.
5.10 NER S5.2.5.16 - Voltage phase angle shift	Agree
5.11 Definitions of CUO, rise time and settling time	

5.11.1 CUO - recognition of frequency response mode, inertial response and active power response to angle jump	Agree
5.11.2 Rise time – explicitly disregards longer-term dynamics and external influences	Agree
5.11.3 Settling time – error band and materiality considerations	Agree
6 Access standards for HVDC links	Shell Energy supports this proposed approach as it coordinates HVDC to the same standard as generation plant.
6.1 NER S5.3a.8 - Reactive power capability	Agree
6.2 NER S5.3a.13 & S5.3a.14 - Response to disturbances in the power system	
6.2.1 Voltage disturbances	Agree
6.2.2 Frequency disturbances	Agree
6.2.3 Fault ride through requirements	Agree
6.3 NER S5.3a.4 – Monitoring and control requirements	
6.3.1 Remote monitoring and protection against instability	Agree
6.4 New standards	
6.4.1 Voltage control	Agree
6.4.2 Active power dispatch	Agree
6.5 System strength [Standard – non fast track – amendment]	While Shell Energy supports the intent behind this proposed change, we consider that the meaning of system strength should be unbundled into separate definitions. By doing so, we consider more appropriate solutions could be designed for. For example, specific issues of the following could be catered for separately in the Rules: • System Frequency control • System voltage control • Fault level • Transient stability • Voltage collapse • Control system stability, etc Each technical issue requires appropriate design. While there are interactions between each area, it would be more beneficial to treat them separately.
7 Access standards for loads [Standard – non fast track – amendment]	

7.1 Recording ride through capability of new loads	Agree
7.2 NER S5.3.3 – Protection systems and settings	Agree
7.3 NER S5.3.10 – Load shedding facilities	
7.3.1 Emergency under-frequency ramp down of large loads	Agree
7.4 New access standard for instability monitoring and prevention	Agree
7.5 Minimum short circuit ratio	Agree
8 Other NER amendments	
8.1 Extension of time for complex issues in future access standard reviews [Standard – non fast track – amendment]	Agree
8.2 Updating references to superseded standards	Agree
8.3 Removing the definition of 'voltage' and 'normal voltage'	Agree
8.4 Rated active power and maximum demand	Shell Energy does not support the proposed change. While minor, we consider that MVA should be used when comparing plant capacity to short circuit level instead of active power capability which is measured in MW. Agreement of physical units should be used when making comparisons.
8.5 Other clarifications and streamlining of rules	Agree

Shell Energy thanks the AEMC for the opportunity to provide comment on this matter. If you would like to discuss any part of this submission, please contact Peter Wormwald at peter.wormald@shellenergy.com.au.

Yours sincerely

[signed]

Libby Hawker

General Manager – Regulatory Affairs and Compliance