7 February 2025

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AEMC

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Dear Achint

Improving the NEM access standards draft rule and determination

The Clean Energy Council (CEC) is the peak body for the clean energy industry in Australia, representing nearly 1,000 of the leading businesses operating in renewable energy, energy storage, and renewable hydrogen. The CEC is committed to accelerating the decarbonisation of Australia's energy system as rapidly as possible while maintaining a secure and reliable supply of electricity for customers.

CEC welcomes the opportunity to comment on the AEMC's Improving the NEM access standards draft rule and determination – Package 1.

1. Overview

A Amendments to Access Standards

We have outlined in the attached Annexure our detailed comments on the proposed amendments to the technical requirements set out in Schedule 5.2, Schedule 5.3 and Schedule 5.3a of the National Electricity Rules (**Access Standards**).

Overall, we consider that the proposed changes to the Access Standards address most of the challenges faced since the 2018 rule change and we support the early implementation of the amended Access Standards.

AEMO's industry consultations were primarily in relation to technical requirements under S5.2.5. Although most of the proposed changes to the Access Standards are consistent with AEMO's workshops, there are some specific clauses which are not, and feedback is provided in the Annexure. Although we have provided comments, we consider that AEMC should consult further with industry on these specific clauses, if necessary, by extending the time for consultation on this rule change.

B Amendments to the National Electricity Rules other than the Access Standards

We only support a fast-track rule change in respect to amendments to the Access Standards, and consequential amendments to the other parts of the NER (such as definitional changes[1]) directly

[1] For clarification, the changes to the definition of Continuous Uninterrupted Operation in the Chapter 10 glossary should be included in this fast-track rule change.

needed to implement the revised Access Standards. However, CEC is strongly opposed to the inclusion of any other changes to the National Electricity Rules in this fast-track rule change. These should be carved out from this rule change request and included in a separate rule change which follows the standard consultation procedure (such as Package 2 of the amendments). This approach will facilitate the early implementation of the amended Access Standards and avoid amendments to other parts of the NER with unintended consequences: see Section 2 - 4 below.

In particular:

- We recommend that the amendments to clause 5.3.4A(b), as well as the deletions to S5.2.5.1(c), S5.2.5.4(d), S5.2.5.5(q), S5.2.5.12(c) and S5.2.8(d), should not be adopted. The proposed amendments to s 5.3.4A(b) have the (unintended) consequence of **undermining the open access shallow connection framework of the NEM**: see Section 2(b) below**.** This will result in the costs of projects materially increasing which will be passed on as higher energy costs (contrary to the NEO). Further, we do not consider that AEMO has the jurisdiction to implement the amendments to 5.3.4A(b) under this fast-track rule change: see Section 2(c) below.

- We consider that any changes to 5.3.4A should not be progressed until the end of the CRI workstreams and should be part of a separate rule change following the standard consultation procedure. AEMO should consider **all** changes which are needed to clause 5.3.4A, as already identified by industry (but excluded from the scope of NEM Access Standards review by AEMO), as well as those further amendments identified through the CRI workstreams: see Section 2(a) and (e) below.

2. Clause 5.3.4A of the NER

We set out below the reasons why Clause 5.3.4A of the NER (including the amendments to clause 5.3.4A(b) should be excluded from the fast-track rule change (except to implement definitional changes proposed in this rule change).

(a) CRI workstreams is likely to identify other changes Clause 5.3.4A of the NER

Any changes to clause 5.3.4A should be delayed until AEMO finishes its CRI workstreams. As part of the in-flight CRI workstreams, AEMO is consulting with NSPs and industry and producing fact sheets on the requirement to target the Automatic Access Standard in clause 5.3.4A and on the 5.3.9 process. It is likely that AEMO and industry will become aware of other changes which need to be made to clause 5.3.4A of the NER (and clause 5.3.9) during this consultation process. As AEMO noted in its submission on the R1 rule change:

> *AEMO also notes that, following this rule change, the CRI clause 5.3.9 rule change workstream will further review issues associated with the application of clause 5.3.4A(b1) with a view to increasing flexibility and certainty in the connection process. In this review, the CRI will take into consideration the interdependencies with the AEMC's final rule under this current process, and any further amendments to clause 5.3.4A(b)(1A) that may be required.*

(b) Amendments to 5.3.4A(b) undermine the open access shallow connection framework of the NEM

5.3.4A(b) of the NER has been amended to add the following wording:

> *where the assessment of those matters considers**, as relevant** and in the range of expected power system operating conditions, the expected performance of the existing power system, considered projects and **projects for connection of Network Users that the Network Service Provider reasonably considers will proceed.** (italics added)*

This wording qualifies 5.3.4A(b)(1) to (4) inclusive.

We understand from the AEMC that the purpose of the amendment is not to broaden the existing requirements under the NER. However, the amendment has broad, and it would appear unintended, consequences and should not be considered in a fast-track rule change (nor as part of this rule change request).

Clause 5.3.4A(b), as amended, has the potential to undermine the NEM's open access shallow connection framework

Clause 5.3.4A(b), as amended, is far broader than the existing provisions of Schedule 5.2 of the NER:

- It gives the NSP an unfettered discretion as to whether it will take into account "projects for connection of Network Users that the Network Service Provider reasonably considers will proceed" in its assessment of **any** of the technical standards set out in Schedule 5.2. This contrasts to the existing rules which only permits the NSP and AEMO to consider "any other project for the connection of a Network User for which …. the Network Service Provider and AEMO reasonably consider the Network User will connect to the power system" in relation to S5.2.5.1 only. This wording is appropriate in relation to S5.2.5.1 as that generator performance standard is concerned with network benefits and long-term network planning and projects of other developers "in the pipeline" will not impact a project's capability to meet S5.2.5.1.

- Under S5.2.5.1, AEMO and the NSP must form a joint view as to whether the project will connect. By contrast, the draft rule permits the NSP to form this view unliterally, broadening its discretion.

- There are no clear criteria for a project to satisfy in assessing whether a project will proceed.

  This contrasts to the clear criteria in the definition of a "Considered Project" for transmission in the Chapter 10 Glossary of the NER or in the definition of "Committed Project" for generation projects under clause 11.10A.1 of the NER.

- The only qualification is "as relevant" but there are no objective factors for assessing relevancy and there is no requirement for the NSP to provide reasons to justify its decision to take into account projects that it considers are likely to proceed in assessing GPSs other than S5.2.5.1. As a result, the qualification, "as relevant", is unlikely to place a limit on a NSP's discretion.

- We note that S5.2.5.4(d), S5.2.5.5(q), S5.2.5.12(c) and S5.2.8(d) refers to "other relevant projects". However, in relation to these generator performance standards, the NSPs and AEMO only consider committed projects (ie those that have executed an offer to connect) in

their wide area modelling. This is narrower than the projects that the proposed amendment to 5.3.4A(b) would permit the NSP to consider in its unfettered discretion in relation to the generator performance standards other than S5.2.5.1.

It is appropriate that AEMO and NSPs interpret "other relevant projects" as restricted to committed projects for several reasons:

- a project that has not reached committed status is not relevant as the NSP and AEMO have no way to know if such a project will proceed. Whether a project is likely to proceed depends on confidential information of the developer.

- taking into account projects which are not committed is inconsistent with the open access shallow connection framework of the NEM. Unlike S5.2.5.1, neighbouring projects in the pipeline affects a project's capability to comply with the generator performance standards other than S5.2.5.1.

In exercising its wide, unfettered discretion under the proposed amendment, the NSP could require proponents of generating systems connecting to the power system to take remedial action, or bear costs, in order to facilitate the connection of subsequent generators. **These amendments undermine the open access shallow connection framework of the NEM.**

The AEMC has confirmed that the open access shallow connection framework applies to the National Electricity Market and the implication of such a framework is that:

> *"proponents of generating systems connecting to the power system should not bear the cost of future, uncertain network developments, including the risk of generator retirements or to facilitate the connection of subsequent generators"*[2]

Changes to the open access shallow connection framework may raise the cost of projects materially, delay projects and deter investment, reducing competition, contrary to the National Electricity Objectives.

A fundamental policy change of this magnitude (with significant impacts on investment costs for new projects in the NEM) requires separate and extensive consultation with industry and should not be included in this fast-track rule change request with its focus on Access Standards.

(c) No jurisdiction to consider changes to 5.3.4A(b) in a fast-track rule change

We consider that the AEMC does not have jurisdiction to include an amendment to clause 5.3.4A(b) of the NER which could result in a fundamental overhaul of the open access shallow connection framework of the NEM in a fast-track rule change. We note that that AEMC is only

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[2] https://www.aemc.gov.au/sites/default/files/2019-08/Generator%20technical%20performance%20standards%20in%20the%20Australian%20National%20Electricity%20Market.pdf; https://www.aemc.gov.au/sites/default/files/content/4ea65c9e-2995-4164-ab4e-ed2584efd126/Fact-sheet-how-transmission-frameworks-work-in-the-NEM.PDF

able to do so under section 96A of the NEL if there has been adequate "public consultation into the nature and content of the proposed amendment"[3]. We do not consider this has occurred as:

- In accordance with NER 5.2.6A, the focus of the consultation was on the technical standards themselves as set out in Schedule 5.2, Schedule 5.3 and Schedule 5.3a of the NER. A fundamental overhaul of the open access shallow connection framework is not related to the issues being consulted on.

- Although the draft amendment to the NER was included in Appendix 2 of AEMO's Update Report dated 26 July 2023, we consider that there was no adequate public consultation into the nature and content of the proposed amendment for the purposes of section 96A of the NER for the following reasons:

    - the amendment is in a 262 page document containing the revision marking made to the National Electricity Rules
    - the far-reaching implications of this amendment to 5.3.4A(b) was not made explicit as part of AEMO's consultation into the technical standards in S5.2.5
    - no specific feedback on the amendment to 5.3.4A(b) of the NER was sought.

(d) Proposed amendments to 5.3.4A(b) should not be adopted

We recommend that the amendment to 5.3.4A(b), as well as the deletions to S5.2.5.1(c), S5.2.5.4(d), S5.2.5.5(q), S5.2.5.12(c) and S5.2.8(d), should not be adopted. The current rules are more certain, stating what the NSP and AEMO may consider in the assessment of each of the technical standards. Removing these amendments will allow the substantive changes to the Access Standards to be progressed without delay under a fast-track rule change.

Changes needed to proposed amendment to 5.3.4A(b)

Alternatively, if the AEMC is minded to pursue an amendment to 5.3.4A(b), we consider that this should be done separately from this fast-track rule change to permit adequate consultation (following the standard consultation procedure). Changes are needed to the proposed draft amendment to 5.3.4A(b) to clarify and limit its scope.

Committed Generation Projects

Changes are needed to the proposed draft amendment to 5.3.4A(b) to clarify and limit its scope in relation to generation projects. For example:

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[3] 96A—"Fast track" Rules where previous public consultation by electricity market regulatory body or an AEMC review

(1) This section applies if—
(a) an electricity market regulatory body has—
(i) made a request for the making of a Rule under section 91(1); and
(ii) consulted with the public on the nature and content of the request before making that request

- a NSP should only be able to consider "committed" generation projects of developers (ie those that have at least executed an offer to connect) and committed generation projects should be defined by clear criteria in the rules following industry consultation[4]
- a NSP should only be able to decide on the relevancy of each of the assessment criteria jointly with AEMO (with respect to AEMO advisory matters) providing reasons for their decision.

Transmission projects with considered status

It is not clear why the NSP is given a discretion as to whether to take into account "considered projects" for networks (ie network projects that have reached considered status) in the assessment of generator performance standards. A NSP should take into account considered projects for networks in all circumstances.

Other transmission projects

The AEMC should consult on:

- whether there are circumstances when a NSP should take into account other major network augmentations or other transmission works which are likely to proceed but have not reached a considered project status; and
- the criteria for these projects.

The Connection Applicant should be able to request the NSP consider such projects if they are likely to be relevant to the assessment of the generator performance standards.

In addition, there should be an obligation on the NSP to:

- provide a developer (in the connection enquiry response), or upon request, information about these projects.
- publish information about such projects as early as when the information is available, so it is accessible by all stakeholders (including developers making decisions about where to locate projects, AEMO, policy makers and academics). This will enhance locational decision making and planning[5].

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[4] Please note that a project that obtains a section 5.3.4A letter is not "committed" – there is a need for a project to obtain environmental approvals, obtain financing, negotiate contracts and consider CAPEX before the developer is in a position to execute an Offer to Connect to commence construction activities. A project may get a 5.3.4A letter but may never proceed with construction. Projects may also be competing for limited space and a project may decide not to proceed, if the other project competing for the same limited space commences construction first.

[5] CEC has been advised that TNSPs do not provide information about a major planned transmission project, even if it is under construction, until the project has reached "considered" status eg network information was not released on Project EnergyConnect until after construction had commenced on that the basis that the project had not reached considered status

We suggest again that this additional consultation should be outside this fast-track rule change to ensure that there is adequate time to take into account industry's views and to ensure early implementation of the access standards.

(e) Industry's views on clause 5.3.4A of the NER have not been considered

During the consultation on the NEM Access Standards Review, industry proposed changes to Clause 5.3.4A of the NER (including the removal of the Automatic Standard Target as part of the NEM Access Standards Review). Industry was informed by AEMO that they were out of scope from this review. We consider that the AEMC should consider changes industry are recommending to Clause 5.3.4A, not only amendments put forward by AEMO.

(f) Other assessment criteria in Clause 5.3.4A(b) (as amended)

We also note that the other assessment criteria in the proposed amendments to Clause 5.3.4A(b) are also broader in their application than under the existing GPS in Schedule 5.2 of the NER. Under the existing rules, the NER may only consider:

- the expected performance of existing networks and considered projects under S5.2.5.4(d), S5.2.5.5(q) and S5.2.8(d)
- the expected performance of existing generating plant and other relevant projects under S5.2.5.4(d), S5.2.5.5(q), S5.2.5.12(c) and S5.2.8(d)
- control systems and protection systems, including auxiliary systems and automatic reclose equipment under S5.2.5.5(q)
- control systems and protection systems, including automatic reclose equipment under S5.2.5.12(c)
- the expected range of power system operating conditions under S5.2.5.5(q) and S5.2.5.12(c).

As the proposed amendment to clause 5.3.4A(b) of the NER makes changes to these rules, this should be consulted on and considered outside the fast-track framework.

3. Other material amendments

In relation to the definition of Schedule 5.2 Participants in proposed draft S5.2.1(b)(2), we consider that the NSP should be required to provide written reasons for requiring an otherwise exempt production system from complying with the requirements in schedule 5.2 in order to minimise any adverse effect of the connection or operation of the production system on the quality or security of network service to other Network Users.

4. Amendments to be carved out from this rule change

The AEMC are consulting on 262 pages of amendments to the National Electricity Rules over a short time frame. We are concerned that there could be small changes with significant impacts which industry could have missed. We only support a fast-track rule change in respect to amendments to the Access Standards, and consequential amendments to the other parts of the

NER (such as definition changes[6]) directly needed to implement the revised Access Standards. However, CEC is strongly opposed to the inclusion of any other changes to the National Electricity Rules in this fast-track rule change. These should be carved out from this rule change request and included in a separate rule change which follows the standard consultation procedure (such as Package 2 of the amendments).

For avoidance of doubt, as noted above, we do not consider that amendment to 5.3.4A(b), as well as the deletions S5.2.5.1(c), S5.2.5.4(d), S5.2.5.5(q), S5.2.5.12(c) and S5.2.8(d), should be adopted, or considered, in this rule change.

For certainty as to what is within the scope of the rule change, we recommend the AEMC indicates which amendments are no longer within the scope of the rule change (by publishing a marked-up version of the changes still within scope of this rule change).

We note this will allow the early implementation of the amended technical standards and will avoid amendments with unintended consequences.

5. Civil Penalty Provisions

The draft determination suggests the civil penalty provisions in 5.2.3, 5.2.3A, 5.2.4, 5.2.5, 5.2.5A should stay the same, but the marked up draft rule states that AEMC is recommending the removal of the civil penalty provisions. We recommend that the AEMC should consult with industry if it proposes to remove the civil penalty provisions in 5.2.3, 5.2.3A, 5.2.4, 5.2.5, 5.2.5A.

6. Transitionary arrangements

We note that the AEMC is proposing transitionary arrangement such that projects that have submitted a connection enquiry but not yet submitted a connection application would be subject to the new NER version. Months before submitting a formal connection application, proponents invest significant amounts of time and costs in developing plant designs and undertaking power system studies.

To avoid having to revise this work, it is recommended that projects that have submitted a connection enquiry and are actively preparing a connection application should have the option to work under the old NER. Otherwise, this will add additional costs and delays to project and delay the energy transition, especially given some of the proposed changed to clause S5.2.5.1 which may require applicants to redo any power system studies completed to date.

As always, the CEC welcomes further engagement from the AEMC on this reform. Further queries can be directed to Diane Staats on dstaats@cleanenergycouncil.org.au.

Kind regards

Christiaan Zuur
Director, Market, Operations and Grid

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[6] For clarification, the changes to the definition of Continuous Uninterrupted Operation in the Chapter 10 glossary should be included in this fast-track rule change.

ANNEXURE

S5.2.5.1 – Reactive power capability	
Temperature derating for reactive power (a1) under the AAS	The generally accepted process in the NEM has been that the Automatic Access Standard is required for a non-derated temperature only. Performance at higher temperatures due to inherent derating is then captured in the GPS and this approach was consistent with the AEMO consultation workshops. We note that new requirement for no temperature related derating of reactive power below 50 degrees for the automatic access standard. This is surprising given that during the AEMO workshops as well as AEMO's final recommendations report did not indicate this requirement. AEMO's final recommendation report provided three options as follows (page 31): • *Option 1: To require the same reactive power regardless of temperature derating* • *Option 2: To require the same active power regardless of temperature derating* •*Option 3: To require the reactive power proportional to active power accounting for any temperature derating. [sic]* *The recommended Option 3 is a middle-ground where reactive power and active power both reduce proportionally when a temperature derating applies (p32).* This requirement is likely to be a barrier for certain technologies such as wind turbines which will derate or shutdown generating units above hub height temperatures of 40 to 45 degrees despite not reducing reactive power up to this temperature and will hence have to aim for a NAS. We note that clarification is required as to how and where temperature is measured as this varies significantly depending on the technology type. For example, a solar farm may measure temperature at

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	inverters and/or met stations and use a combination of these measurements to calculate derating. Whereas a wind farm would take measurements at hub height. Consequentially a hub-height temperature would be much lower than that at ground level. We also suggest that this wording be revised as de-rating itself should not be the focus, but rather the required quantity of reactive power. E.g., if a plant can provide a certain reactive power capability at a higher temperature, even if it achieves this via de-rating, then this should not preclude the plant from demonstrating compliance with the Automatic Access Standard. Noting the requirement under clause 5.3.4A(b1) (the need to meet the AAS), we urge the AEMC to reconsider this requirement.
Mid-point voltage (a1)	The concept of a reduced reactive power requirement at higher or lower voltages from a mid-point voltage is generally welcome. There should, however, be transparency in how this mid-point voltage is determined by the NSP taking into existing and committed projects and be based on the actual power system needs (and not a hypothetical operating point). A single mid-point voltage value only should be utilised and this documented in the performance standards.
Requirements when connected but not in service (a2) & (b2)	It is understood that the intent of some of this wording is to capture requirements when generating units are connected and not generating versus when units are not connected. However, the wording is not clear and could be open to interpretation. We recommend that clear definitions be provided in relation to the terms 'in service' and 'connected' in relation to generating units. We note that the term 'in service' is not defined and could be open to interpretation. E.g. a unit electrically connected but not generating could be considered in service for the purposes of providing reactive power. There is uncertainty as to how much reactive power capability is required when generating units are not generating (either when connected or not connected). These clauses should be reworded to provide certainty around the required reactive power capability under these scenarios.
Requirements when electrically connected but not in service (a2)	It is noted that this clause requires the voltage at the connection point to not change compared to when the plant is not electrically connected. This is likely to require additional studies but to the extent that this limits the amount of reactive power support required by an NSP/AEMO when the plant is not in service, the proposed changes are not unreasonable.

	We recommend that definitions be provided in relation to the terms 'in service' and 'connected' in relation to generating units, otherwise interpretation may be inconsistent.
Proportional derating of active and reactive power (d1)	This clause requires a proportional derating of active and reactive power. It is unclear exactly what the intent is here. Is the requirement that reactive power be derated proportional to active power or that both active power and reactive power should be derated at a constant rate? Note that this may not be achievable in practice. For example, OEMs have different derating methodologies that are specific to the technology type (e.g. for active power, derating at a fixed rate from 25 degrees to 40 degrees, then a different rate from 40 degrees to 45 degrees). We suggest that this should be an operationally informed "availability" rather than a hard limit and prescribed requirement.
General requirements when not generating (e1)	We understand that that intent of this wording is to provide certainty to projects in terms of the required reactive power compensation when not generating and this is generally welcome (e.g. solar farms at night or wind farms during low wind period). Some clarity is required, however, to ensure the intent of the rule is met. For example, this clause has a requirement that states *"provided the reactive power performance of any individual production unit is not lower than its performance when all production units are in service".* It is unclear what the intention of this clause is and could preclude the connection of some technologies. Hence, it is recommended that this clause be removed. For example, on a wind farm with Type 3 turbine at low output, some turbines may need to operate with a reduced reactive power capability for operational reasons. This would be consistent with the performance standards, but this new clause (e1) would preclude this operating scenario**.**
NER S5.2.5.4 – Generating system response to voltage disturbances	
Automatic Access Standard and undervoltage ride-through requirements (a) (7)	The 80% figure is crossed out and appears to be a typographical error.
Overvoltage requirement above 130 % (a)(1)	We note the intent to improve the wording over the existing NER in that the "over 130%" has been replaced with "at least marginally exceeding 130%" which is generally welcome. The concern is, however, that this is still unbounded ie would marginally be 130.1%, 131% or 135%? An upper limit should be clearly stipulated that can be met by equipment currently in the market.

General requirements clause (e1)	The addition of this clause and clause (e2) is generally welcome as it has, to date, been silent in the NER. However, we recommend that the 10% change be from a single voltage point as nominated by the NSP (either the nominal voltage or a target voltage consistent with the project connection location).
NER S5.2.5.5A – Response to Disturbances Following Contingency Events	
Negative sequence current (f)(1)(iii)	We recommend the wording "negative sequence current or equivalent contributions to oppose unbalanced voltages during a disturbance" be revised. Negative sequence current can assist in reducing voltage rise on the unfaulted phase, however, controlling unbalanced voltages on the network are out of the reasonable control of a generator (and mostly a function of the network design upstream of the connection point).
Response commencement (g)	In relation to clauses (g)(1)(i) and (g)(1)(ii), it is not clear where the voltage thresholds for the commencement are intended to be assessed at ie the connection point or unit terminals. To the extent that this is to be agreed with the NSP and AEMO, there are no further comments.
Capturing response characteristics (t)	We recommend removing clause S5.2.5.5A(t) or limiting its application to grid-following inverters, as it is not applicable to grid-forming inverters or synchronous generators that have an inherent response. The clause requires the GPS to record functions which are fundamentally based on Ohm's Law, and also mandates sequence components conversions standard theoretical concepts that do not provide additional practical value. For systems employing direct unbalanced control, these requirements impose unnecessary documentation of well-established sequence components calculations - thus adding unnecessary complexity to the GPS without delivering meaningful benefits. This undermines its intended purpose to focus on practical, actionable standards that enhance system operation.
Conditions for provision of a reactive current response (t)(7)	The wording in the draft rule requires a performance standard document: *"…all conditions (which may include temperature) considered relevant by AEMO and the Network Service Provider under which the reactive current response is required; …"* This may require extensive descriptions of the various network scenarios, ambient conditions, plant operating scenarios etc to be captured in the performance standards. A more efficient approach would be that the performance standards document any conditions for which the response *cannot* be provided or will be *limited,* based on the particular technology or system design.

Other comments	The wording in S5.2.5.5A(f)(1)(i), (f)(1)(ii), m(1)(i), and m(1)(ii) are not consistent. Some refer to positive sequence voltage, some do not; some use "the relevant point", some use "the relevant percentage", some do not use either.
NER S5.2.5.7 – Partial load rejection	
Removal of reference to asynchronous units	We note that this clause no longer applies to asynchronous units and is welcome as this clause is not typically problematic for asynchronous plant and will reduce modelling requirements.
NER S5.2.5.8 – Protection of generating systems from power system disturbances	
Establishing an AAS and NAS	We note that AEMO has restructured this access standard to establish a AAS and NAS as recommended by the CEC during the AEMO workshops. This change is welcome and will allow for accommodating various technology types and hence supported by the CEC.
NER S5.2.5.10 – Protection to trip plant for unstable operation	
Access to / provision information (3)	Detecting control interactions across the power system requires access to data from various generators and to this extent we are supportive of this being addressed at a system level. We recommend that AEMO publish a document stating the type, frequency and duration of information required to be stored and/or provided to avoid delays to projects during the registration phase.
General requirements – Requirement for communicating information (e)	We note that this clause requires communicating information if required by the NSP. We believe there should be a justified need for a NSP to request this information, otherwise NSPs may require this unilaterally resulting in additional costs to projects.
Automatic disconnection (a)(2)(iii)(B)	Oscillation detection systems in the NEM are in their infancy and currently being trialled. Members have raised concerns around automatic disconnection in the absence of a proven scheme. It is recommended that automatic disconnection not take place until a solution is proven, otherwise this could have an adverse impact on the power system. Detecting oscillations and/or instability for asynchronous plant is a complex offline process and there are presently, to the best of our knowledge, no automated, proven solutions that can meet the requirements proposed.
MAS (b)(2) - PMU data	Minimum Access Standard (b)(2) gives AEMO/NSP the power to request Phasor Measurement Unit data to be sent to them. There should be an obligation for the NSP/AEMO to give written reasons to justify their request.

NER S5.2.5.11 – Frequency Control	
Droop control at unit terminals (j)	We recommend that detail such as the droop calculation should be captured in technical supplementary documentation rather than the GPS. Over prescription in the NER of GPS requirements is detrimental to allowing the NSPs and AEMO sufficient flexibility to manage the power system.
NER S5.2.5.13 – Voltage and reactive power control	
Secondary control mode (only)	We welcome the change to reduce the number of modes to two and the flexibility for the second mode to be either reactive power or power factor if the primary mode is voltage. This is expected to help streamline the connection process and reduce costs not only during the development phase but also during commissioning.
Range of system impedance (v)	The nomination of a range of equivalent system impedances is generally welcome such that changes in the power system (which are outside of a generator's reasonable control) which may result in a non-compliance are captured. We recommend that clarity be provided as to how this will be computed and require that there is transparency on the calculation procedure - in particular, relating to how the impact of adjacent plant is incorporated into the equivalent impedance.
Table S5.2.1 AAS rise & settling times	For the scenario of voltage as a secondary controller, we understand that AEMO is aiming to reduce time, effort and costs, however, it is unclear how settings will be proved if there are no performance requirements for the case of a setpoint change. Relying on a network event to demonstrate settings or compliance is likely to be impractical for this clause. This is because network events rarely result in a voltage step change and/or a sufficient voltage change to demonstrates compliance or prove settings.
Table S5.2.1 AAS rise & settling times	Similar to the above comment, for the scenario of reactive power as a secondary control, it is unclear how settings will be proved if there are no performance requirements for the case of a setpoint change. Relying on a network event to demonstrate settings or compliance is likely to be problematic for this clause.
Settling time (l) (2)(ii)	The addition of clause (l) is generally welcome as a means of accommodating measuring inaccuracy for very small changes. To ensure clarity, we recommend clarifying that the <u>maximum</u> reactive power capability should be the basis of the calculation (as the reactive power capability can vary for different active powers).

Impedance nominated by NSP	We welcome the introduction of this methodology which will assist in demonstrating compliance in the presence of changes to the power system. Clarity is required as to the form of how this impedance is represented (e.g. is it an equivalent SCR, fault level or impedance?) Furthermore, there should be a transparent process for calculating this impedance so that there is consistency across the NEM (in particular, how adjacent plant is incorporated into the impedance).
S5.2.5.16 Voltage Vector Shift	
Removal of this clause	Voltage vector shift protection is not a reliable means of anti-islanding protection and desensitising it to the point where it does not operate is counter to the intent. We welcome the removal of this clause as per the feedback we provided to AEMO during access standard review workshops.
Normal Voltage	
Reference to Normal voltage	We note the references to Normal Voltage being removed along with clause 5.3.11 Notification of request to change normal voltage. This term was historical and has not been utilised over recent years hence removal is welcome.
Negotiated Access Standards	
5.3.4A(b)(2) and system standards	The proposed changes include additional wording "…or achievement of the system standards". We acknowledge that generators should not prevent a NSP from meeting the system standards, but responsibility for meeting the system standards lies with NSPs, not generators. Hence, we recommend removal of this wording.
5.3.4A(b) and projects reasonably likely to proceed	It is noted that new wording has been added which requires consideration of "projects for connection of Network Users that the Network Service Provider reasonably considers will proceed". This consideration is purely at the discretion of the NSP. To provide certainty to connecting parties, and to remove unintended consequences of the amendment to clause 5.3.4A(b), we recommend that the amendments to clause 5.3.4A(b), as well as the deletions S5.2.5.1(c), S5.2.5.4(d), S5.2.5.5(q), S5.2.5.12(c) and S5.2.8(d), should not be adopted. See further comments in Section 2 above.

5.3.4A(b1) – Need to meet the AAS	We urge the AEMC to revisit the need to the need to meet the AAS under this clause. The need to meet the AAS can have a direct impact on CapEx for a project in the absence of any power system needs. Hence, we recommend this need to meet the AAS be removed. Furthermore, meeting the AAS can be detrimental to the power system in some cases (e.g. large amounts of reactive current injection during faults in weak grid can often result in over-voltages post fault clearance). To the extent that meeting the AAS is a matter of tuning (that is, no CapEx impact), this is acceptable, however, clauses such as S5.2.5.1 require additional plant and hence increased CapEx to meet the AAS.