Friday, 16 May 2025

AEMO

Sent by email to contact.connections@aemo.com.au

CEC submission on R1 Capability Assessment Guideline (including conditions on registration)

Dear Sir/Madam

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.

The CEC welcomes this opportunity to comment on the draft R1 Capability Assessment Guideline (Guideline) and associated R1 Capability Assessment Request Form (Request Form).

The CEC overall supports the Guideline in its current form and considers that it has the potential to speed up the capability assessment process provided the pragmatic scoping and assessment process outlined in sections 2 - 4 of the Guideline is followed and provided the kick off meeting and scoping assessment takes place in a timely manner. However, we have recommended some drafting changes to ensure that the capability assessment process, as implemented by the Guideline, gives effect to the principles outlined in section 1 of the Guideline:

- the connections process is consistent, predictable and improves investment certainty.
- the connections process is time-efficient and reduces costs, without compromising power system security and operability.
- the assessment requirements are pragmatic and fit for purpose.
- there is a collaborative approach between Connection Applicant, the NSP and AEMO.
- there is a collective commitment to problem-solving to facilitate outcomes.

CEC's responses to AEMO's consultation questions in its Draft Report on the R1 Capability Assessment Guideline (including conditions on registration) are set out in the attached Appendix 1 and should be read in conjunction with our comments in the submission and in Appendix 2 below.

We recommend that consultation on this draft Guideline is extended by a short period (4 - 6 weeks) so that AEMO can circulate a further draft which incorporates feedback from industry (including the additional clarity that industry is seeking) and so that there is the opportunity for AEMO to consult on the Guideline more broadly with industry.

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We also recommend that, after the Guideline is implemented, there are informal and formal review processes to ensure that the capability assessment process is working as intended.

1. Scoping Assessment

We broadly support the process for scoping the information and data (including studies) to take into account the site-specific attributes of the plant and the extent of change to either the design of the plant or the external power system since 5.3.4A/B letters were issued, as set out in Section 3 of the Guideline. The scoping process is intended to avoid unnecessary repetition of studies previously undertaken and to permit AEMO to only require a subset of the information and data in Appendix B where appropriate.

We consider that the wording around when further simulation studies or extensive studies may be required in section 3.2, 3.2.1 and in section B4 (on page 32 of the Guideline) is too broad and has the potential to be inconsistent with the pragmatic scoping and assessment approaches otherwise outlined in sections 2, 3 and 4 of the Guideline. The wording in these sections needs to be carefully qualified to ensure that the TNSP or AEMO does not routinely require additional studies (in substitution to the exercise of engineering judgment as to when those studies are needed, as proposed in sections 2 - 4 of the Guideline).

In CEC's view, it is too broad to require simulation studies simply because the impact of the change on performance standard compliance, or the impact of the plant on the power system, **is not clear.** Consideration should be given to limiting the circumstances where studies should be required, for example, where there are material changes to the GS/IRS from the initial design, or external changes, since 5.3.4A/B letters were issued, which are likely to have an impact on performance standards compliance and that impact is likely to be considered material for the purposes of section 4.4 of the Guideline (for example, where the plant is likely to have a potentially large impact on the power system).

The Guideline should be amended to make clear that any studies should:

- only be required in respect of those aspects of performance standard affected by the relevant changes to the plant or the relevant external changes
- only consider conditions or scenarios which actually happen in the real network. This includes for fault type and depth and oscillations.
- not be required where the lack of clarity relates to AEMO's and NSP's understanding of the network.

1.1 Proposed wording changes

- **Section 3.2** needs to make clear that reasons must be provided if further studies are required after the scoping assessment. The third paragraph of section 3.2 needs to be amended as follows:

  As the capability assessment is carried out, depending on the findings of the assessment, AEMO and/or the NSP may request further clarifications and/or data and information and ***any such request must be accompanied by written reasons for the request*****: NER 5.3.7A(g).**

- In **section 3.2.1**, paragraph 2 should be amended to read:

  Simulation studies may be required to examine:

- ***those*** ~~*A*~~*aspects of performance* ***standards affected by the relevant changes to the plant or the relevant external changes*** ~~*that have not been previously reviewed .*~~
- *Model changes where the impact of the change on performance standard compliance or the impact on the power system* ~~*is not clear*~~ ***cannot be assessed from existing data and information and are likely to be material****.*

- As noted above, there should be limits placed on when simulations studies should be required in section 3 and section B4 in Appendix B.

  For example, in order to place limits on when simulation studies are needed, we recommend that Section B.4 should be amended to read:

  Simulation studies may be required from the Connection Applicant to support the capability assessment application (for example, where there are ***material*** *changes in the GS/IRS compared with the initial design, or to consider external changes since* 5.3.4A/B letters were issued ~~*connection application*~~*,* ***which are likely to have an impact on performance standards resulting in a non-compliance or where the GS/IRS is likely to have a large impact on the power system***)*. The nature of the simulation studies will be similar to that of the connection application stage. AEMO and the NSP will advise the required simulation studies as an outcome of the scoping assessment and as the capability assessment progresses, if further clarification or evidence is required.* ***The simulation studies should be limited in scope, for example, to those aspects of the performance standard affected by the changes and to considering conditions or scenarios which actually happen in the real network. Written reasons must be provided for requiring additional studies following the scoping assessment. Connection Applicants may also request additional clarification of such information requests (which AEMO or the NSP (as relevant) must provide within five business days of receiving that request).***

  We recommend that limits should be placed on circumstances when simulation studies can be required in section 3.2 as well. However, we have not attempted suggested relevant drafting amendments to section 3.2.

1.2 Indicative timeframe for kick off meeting and scoping

CEC in their comments on an earlier draft of the R1 guideline suggested including an indicative timeframe for the kick off meeting and scoping of the capability assessment. We are disappointed that AEMO has not included indicative timeframes in the current draft despite the feedback it received from industry.

We recommend that an indicative timeframe of 20 business days for both the kick off meeting, and scoping of the capability assessment, after the submission of complete initial data and information in Appendix A, be included in the Guideline. We recommend a new section 2.2.3 be included that states:

> ***2.2.3 Timing of kick off meeting and scoping assessment***
>
> *It is anticipated that the kick off meeting, and scoping assessment of further data and information required for the capability assessment, will occur within 20 business days of request for a capability assessment and the receipt of the initial data and information in Appendix A. However, additional time may be required depending on the complexity of the capability assessment and the Connection Applicant will be advised and given reasons if additional time is required.*

Although the indicative timeframe is non-binding, it will nevertheless encourage the TNSPs and AEMO to invest in the human resources necessary to ensure that the R1 capability assessment occurs in a timely manner and to avoid the Connection Applicant being stuck at the R1 stage while waiting for a kick of meeting to scope of the information/data needed for the capability assessment.

1.3 Changes since 5.3.4A/B letters were issued

We consider that R1 guideline should be focussing on changes since the 5.3.4A/B letters were issued, rather than changes since the connection agreement was executed. This better aligns with the focus on performance standard (set out in 5.3.4A/B, when it is agreed). In addition, there can be months or even years between 5.3.4A/B letter issuance and connection agreement execution.

2. Additional information and data requested after the scoping assessment

We recommend that section 3.2 of the Guideline be amended to:

- outline the full requirements of NER 5.3.7A(g) and (h).
- provide additional detail about what should be contained in the written reasons which must accompany additional data and information requests. NER 5.3.7(g) contemplates that the written reasons for requesting additional data and information from the Connection Applicant must be "with reference to relevant requirements of the registration information resource and guidelines", not merely the requirements of the NER.

Suggested amendment to section 3.2 of the Guideline include:

> *AEMO and the NSP (as relevant) will provide additional detail for connection-specific information requests, for example, specific concerns AEMO and the NSP may have with reference to the relevant parts of the performance standards, or power system impacts, which give rise to those concerns. As the capability assessment is carried out, depending on the findings of the assessment, AEMO and/or the NSP may request further clarifications and/or data and information.* ***When requesting such data and information following the scoping assessment, AEMO and NSPs must provide written reasons for the request. The reasons should give sufficient detail to identify concerns regarding the capability of the GS/IRS to comply with its generating performance standards by reference to the relevant parts of the rules in the NER and the GPS and concerns regarding adverse impacts on power system security by reference to specific rules of the NER.*** *Connection Applicants may also request additional clarification of information requests* ***(which AEMO or the NSP (as relevant) must provide within five business days of receiving that request)****.*

We consider that Section 3.2 could provide further guidance on the detail to be provided when giving written reasons to enable the principles outlined in section 1 to be achieved. For example, we suggest that AEMO and NSP be required to:

- give reasons why the benefits of providing the additional data and information (eg to address risks to power system security) outweighs the additional costs and time delays of meeting the information request.

- provide sufficient detail to address the information asymmetry between the Connection Applicant and AEMO and/or NSP (eg where available, providing power system study results (including assumptions/inputs) and snapshots from its network models which substantiate the concerns raised about GPS compliance or power system impacts).

3. External changes

3.1 Approach recommended by AEMC

The AEMC at page 37 in its Final Determination on the *Enhancing investment certainty in the R1 process rule change* (Final Determination) states that the registration information resource and guidelines should set out how AEMO assesses power system risks due to factors that may be external to the connection applicant's plant, and should for example explain:

- how AEMO assesses and manages issues caused by changes to network conditions caused by other connecting plants
- the circumstances where AEMO and NSPs will consider network solutions or collective retuning, instead of plant alterations
- other reforms contemplated by the CRI, such as batching or black box modelling.

The AEMC in its Final Determination also notes at page 64 that "NSPs (and AEMO) can coordinate works to implement lower cost solutions to system strength or other technical issues, instead of unilaterally imposing costs on connection applicants" and that "industry consultation when updating the registration information resource and guidelines can provide better guidance as to when issues will be managed and implemented by NSPs and AEMO, rather than by connection applicants".

3.2 Approach in Guideline

The R1 Guideline only states that:

- external change details from the NSP and AEMO may also inform the scope of assessment such as any change to network or connections (that is, other *Generator* or IRP or *Customer* connections), which could affect the ability of the GS/IRS to meet its *performance standards*, and which was not considered previously as part of the *connection application* assessment. Examples might include newly committed *generation*, or disconnection of *generation*, or changed *network* conditions.- see section 2.2.2
- "external changes might have been identified during the scoping phase which require studies to confirm that the plant's compliance with its performance standards is unaffected – see section 3.2.1 and Section B4 in Appendix B.

More details should be provided in the Guideline on:

- how AEMO and the NSP will treat a change out of the applicant's control such as a recently committed generator or network augmentation works impacting the generator ability to meet its GPS.
- when information of such external changes will be provided to the Connection Applicant.

In our view, the Guideline should also make clear that, whilst it can happen that new generators become committed and the Connection Applicant needs to assess this change, a network change will not be considered a change which the Connection Applicant should be required to address at the R1 stage to the extent that it could be foreseen during the TNSP planning

processes. Connection Applicants should be given as much notice as possible of changes in the network due to new augmentations and operating conditions.

In addition, the Guideline does not deal in detail with how solutions will be found to external changes that result in a non-compliance with performance standard, as recommended by the AEMC in its Final Determination. However, the Guideline is helpful insofar as it recognises:

- in section 2.2.1, a collective commitment to problem-solving to facilitate outcomes
- In section 4.4, where a non-compliance is identified through the capability assessment, AEMO will work with the relevant NSP and Connection Applicant to agree an efficient approach to achieve compliance and where the non-compliance will not have an adverse impact on the power system security and quality of supply to other Network Users, AEMO and NSP may agree to amend the performance standard to achieve compliance (provided the non-compliance is not less than the minimum access standard).

The CEC requests that AEMO provide a pathway to how this guidance on external changes will be provided, in accordance with the AEMC's policy position. We request that AEMO commit to a subsequent review of the Guideline with a view to providing more detail as to how external changes resulting in a performance standard non-compliance will be addressed (as recommended by the AEMC in its Final Determination) and more guidance on solutions that should be adopted to promote the NEO (eg it may consider collective returning if it is considered in a future CRI workstream and becomes more regularly used).

3.3 Recommended amendments to the Guideline

We consider that it would be helpful to amend the Guideline to at least acknowledge that the parties should be exploring solutions other than plant alterations if this will promote the NEO (as recognised by the AEMO in its Final Determination). Accordingly, we recommend

- amending the last bullet point in the first paragraph of 2.2.1 so that it reads:

  Agreeing the approach for resolving matters that arise during the assessment process. ***This will include a discussion of all possible solutions to deal with any external changes so that a satisfactory capability assessment can be achieved in a low cost and timely manner (including solutions which could be initiated by AEMO and NSP).***

- footnote 18 so that it reads:

  Compliance is the expected outcome. Where there is non-compliance, but it is not material, it may be possible to agree to a change in performance standard to achieve compliance. ~~However, the Generator/IRP would bear the risk of material non-compliance needing to be addressed through other mechanisms, and of the plant output potentially being constrained.~~

  We consider that the statement that "the Generator/IRP would bear the risk of material non-compliance needing to be addressed through other mechanisms, and of the plant output potentially being constrained" should be deleted as:
  - it limits consideration of other solutions to deal with external changes affecting the ability to meet performance standards and therefore is inconsistent with the approach recommended by the AEMC (which recommends a consideration of all solutions and adopting the solution that best promotes the National Electricity Objective).

- AEMO and NSPs also have responsibility for minimising impacts of external changes on all projects with executed connection agreements notified to AEMO in accordance with NER 5.3.7(g).

We also consider that it could be made more clear in the Guideline that opening up performance standards (or requiring simulation studies to determine the level of performance change) where there is an alteration to plant that does not result in a performance standard non-compliance, is contrary to the NEO and recommend the following amendment to the fourth paragraph of section 4.2 of the Guideline

> *Where change to performance due to an alteration is small and does not result in non-compliance with existing performance standards (such as minor changes attributable to manufacturing tolerances or to accommodate site conditions), a Connection Applicant's proposal to retain the existing relevant performance standard ~~would usually be acceptable~~* ***should be accepted****, as it would be considered consistent with promoting* ***the NEO, including*** *efficient investment outcomes in the NEM. Simulation studies may be required to confirm compliance and the level of performance change.*

We note that Connection Applicants need to be advised of details from the NSP and AEMO which will inform the scope of the assessment (including external changes affecting their ability to meet their performance standards) as soon as they can and in advance of the kick off meeting. Accordingly, we recommend that Section 2.2.1 be amended to include the following statement:

> *The NSP and AEMO will provide these details to the Connection Applicant as soon as it can and prior to the kick off meeting.*

4. Section 5 - Conditions on registration

We consider that section 5 should be amended to add, at the beginning, the following points for clarification:

- section 5 of the Guideline sets out a ***non-exhaustive*** list of terms and conditions
- the circumstances in which conditions on registration would be accepted is likely to evolve over time based on experience and the evolving nature of the power system.

This reflects:

- the discussions in the focus group on the R1 guideline
- the final determination where the AEMC notes at page 43:
  - its "decision to not specify in the NER the circumstances in which AEMO may conditionally register applicants".
  - that "requiring AEMO to update its registration information and resource guidelines to describe the circumstances where AEMO may use conditional approval for registration aligns with the intention that an instrument guides the process ***which can adapt to the shifting needs of the power system***".

In addition, we suggest the following amendments to section 5 which are needed to make clear that section 5 of the Guideline sets out a **non-exhaustive** list of terms and conditions that AEMO may accept and that other terms and conditions may be considered:

- The first sentence of section 5.1 should be amended to read:

> "AEMO may consider agreeing terms and conditions on registration ***which will promote the National Electricity Objective (NEO)***, ***including*** in the following circumstances:

This reflects AEMO's obligations under section 49(3) of the NER which provides that "AEMO must, in carrying out functions referred to in this section, have regard to the national electricity objective". It utilises the R1 Guideline's existing statement that "the use of the terms and conditions on registration is consistent with the National Electricity Objective" but makes it an overarching guiding principle for the terms and conditions AEMO should consider.

- Section 5.2 should be amended so the second sentence of paragraph one reads:

> "This section provides a ***non-exhaustive*** list of the nature of terms and conditions to which AEMO may agree"

- The second sentence of section 5.3 should be deleted or amended to read:

> "AEMO ~~will only~~ **may** agree to the use of terms and conditions under the circumstances specified in Section 5.1."

The wording "will only" needs to be deleted as it unduly limits the circumstances in which terms and conditions on registration can be applied and, as indicated above, is contrary to the intention of the AEMC of using the R1 guidelines as a flexible, evolving instrument which will permit terms and conditions to be adapted to the shifting needs of the power system, as well as contrary to the discussions in the focus group.

Opportunity for additional terms and conditions

It is important that AEMO is in a position to consider additional terms and conditions which may apply in other circumstances, based on experience and the evolving nature of the power system. For example, we consider that it may be helpful to a develop a framework where conditions on registration could be used where there is uncertainty as to whether CAPEX expenditure on equipment, such as capacitor banks or harmonic filters, is needed in the first place in order to comply with a GPS and where requiring such equipment may have a potential adverse impacts on the operation of the power system in certain circumstances. We acknowledge that the framework to deal with this situation is more complex than the scenarios considered under section 5 and may take time to develop. However, the wording of section 5 should not preclude such a framework from being developed in consultation with industry, especially as it potentially may achieve outcomes more consistent with the NEO (in terms of removal of unnecessary CAPEX which results in higher costs to consumers and improved reliability as it would limit unnecessary capacitor elements that can potentially negatively affect the operation of the power system).

Other amendments to section 5

Conditions on registration: Paragraph 2 of section 5.3 should be amended to read:

> "AEMO retains discretion regarding whether to grant ~~conditional registration~~ conditions on registration."

This reflects the wording in the remainder of section 5 which refers to “conditions on registration”. The CEC understands that AEMO’s intention through the term “conditions on registration” is to adopt a framework that would permit the generator to continue to operate after registration, albeit with certain restrictions, until the terms and conditions are satisfied, rather than a framework whereby registration is revoked if the conditions are not satisfied.

Need for headroom at R0: We support the statement in the Guideline which acknowledges the need for headroom at R0, which would reduce the risk of non-compliance at R1 – for example, from small impedance changes because of manufacturing tolerances and small changes to cabling to account for site conditions – see section 4.1 of the Guideline.

For consistency, we recommend AEMO’s Access Standard Assessment Guide be updated to include, and the AAS Fact Sheet being developed as a CRI workstream also incorporates, this statement.

5. Future review of the R1 guideline

We note that consultation on the Guideline (including the conditions of registration in section 5) has been via an expedited consultation procedure with a limited timeframe for consultation with the whole of industry.

Some of our members have expressed concern that AEMO through the Guideline is changing the R1 process contemplated by the AEMC (albeit with the intention of improving the R1 process) and there has been inadequate consultation with the industry on these changes.

We recommend that consultation on this draft Guideline is extended by a short period (4 - 6 weeks) so that AEMO can circulate a further draft which incorporates feedback from industry (including the additional clarity that industry is seeking) and so that there is the opportunity for AEMO to consult on the Guideline more broadly with industry.

We also consider that it would be helpful if AEMO regularly updates, and seek feedback from, industry on:

- whether the capability assessment process, as implemented by the Guideline, achieves the principles outlined in section 1 of the Guideline ie
    - the connections process is consistent, predictable and improves investment certainty.
    - the connections process is time-efficient and reduces costs, without compromising power system security and operability.
    - the assessment requirements are pragmatic and fit for purpose.
    - there is a collaborative approach between Connection Applicant, the NSP and AEMO.
    - there is a collective commitment to problem-solving to facilitate outcomes.
- its evolving practice in relation to agreeing terms and conditions on registration and the circumstances in which it may be applied.
- its materiality assessment of plant adverse impacts on the power system or quality of supply, including its assessment of “credible adverse event”. Transparency on how AEMO conducts materiality assessments will be critical to investment confidence.

We consider that AEMO should hold online meetings with industry on a regular basis initially (for example, every 6 months). We are happy to set up such meetings with our members.

We also consider that AEMO should review the R1 guideline, annually to begin with, following the formal rules consultation procedure. This, in particular, would provide an opportunity to:

- amend, the documents included in Appendix B
- review and update the section on conditions on registration in light of experience and changing power system conditions
- expand on how the AEMO and TNSP will deal with external changes to find the lowest cost and timely solutions to dealing with external changes so that a satisfactory capability assessment can be obtained for the connecting GS/IRS which promotes the NEO. This might reflect new practices or future CRI workstreams, for example, on collective retuning.
- provide more guidance on its materiality assessment of plant adverse impacts on the power system or quality of supply,

We consider that these informal and formal review processes are needed to ensure that the capability assessment process is working as intended, given the number of renewable energy projects that need to be registered to meet the target of 82 per cent national renewable electricity generation by 2030.

6. Other feedback

We have included feedback on the Guideline which is of a technical nature in a table in Appendix 2.

The CEC welcomes further engagement with AEMO on the Guideline. Further queries can be directed to Diane Staats at dstaats@cleanenergycouncil.org.au.

Kind regards

Christiaan Zuur

General Manager, Market, Operations and Grid

Appendix 1 – Responses to Consultation Questions

CEC responses to AEMO's consultation questions in its Draft Report on the R1 Capability Assessment Guideline (including conditions on registration) is set out below.

Capability assessment process

- ***Is the proposed capability assessment process where the data and information requirements are divided into two main parts appropriate? If not, why not?***

  CEC supports dividing the capability assessment process into two main parts provided the kick off meeting and scoping assessment occurs in a timely manner – see comments in section 1 of our submission.

  We consider that the documents in Appendix B should not be more onerous than those currently required for R1 assessments and should exclude tests that are not widely available nor required under the existing R1 process (eg HIL tests) or requirements which may be contrary to the NEO insofar as it disincentivises upgrades to plant (eg partial cloud shading logarithms). See comments in Appendix 2 to this submission.

  The proposed informal review process proposed in section 5 of CEC's submission would provide an opportunity to check that:

  - AEMO and NSPs are requiring only a subset of the items listed in Appendix B so that the assessment requirements are pragmatic and fit for purpose
  - Connection Applicants have enough certainty around the documents they need for the capability assessment and that the scoping assessment is not holding up the Connection Applicant in submitting all the documents required for the capability assessment in a timely manner ie the documents in Appendix A and the subset of documents in Appendix B which are identified following the scoping assessment.

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- ***Would a more prescriptive capability assessment process better meet the requirements of the NER and be more consistent with the NEO? If so, why and what would a more prescriptive process entail?***

  CEC does not consider a more prescriptive capability assessment process is required provided there is more clarity/guidance on timing and on when further studies may be required – see comments in section 1 of our submission.

- ***Is it sufficient that the data and information submission focuses on changes since the connection agreement was executed? Should other matters inform the contents of the initial data and information submission?***

  CEC considers that the Guideline should be focussing on changes since the 5.3.4A/B letters were issued, rather than changes since the connection agreement was executed. This better aligns with the focus on performance standard (set out in 5.3.4A/B, when it is agreed). In addition, there can be months or even years between 5.3.4A/B letter issuance and connection agreement execution.

- **Are the proposed initial information and data requirements in Appendix A appropriate?**

  Yes, CEC considers the information requirements in Appendix A are appropriate, subject to comments in Appendix 2.

- ***Is the proposed Request Form suitable to support the submission of the initial information and data?***

  Yes.

- ***Appendix B identifies a range of additional information and data requirements that may be required to support the capability assessment, and the reason(s) they may be required. Are there additional information and data items that should be included in Appendix B, or that should be removed from Appendix B? Why?***

  Appendix B is helpful insofar as it provides a comprehensive list of documents that could be required for a capability assessment and outlines the purpose of each additional information requirement. We note that only a subset of these documents will be required in many cases.

  In Appendix 2, we recommend certain items that should be removed from Appendix B. Some of these items in Appendix B (B.2 and B.3 in particular) are not presently required for registration and including them here could have a perverse effect on the registration process.

  As noted in section 3 of our submission, some commentary/clarity/guidance on timing of providing those additional information/data requirements would be beneficial. A lot of those items will not be available until very late in the process. We note that there is some commentary about when OEM test data is available in section 3.1.1 and it would be helpful to include this information in Appendix B and expand for all items in Appendix B where relevant.

  We also note that should more data and information (including studies) be required after the initial scoping assessment, more detailed written reasons for requiring such further data and information must be provided to comply with NER 5.3.7A(g).

Materiality of non-compliance

- ***Is the proposed list of example conditions to guide the approach to address non-compliance with performance standards in Appendix C appropriate? What alternatives do you suggest?***
- ***Is it appropriate that AEMO's interpretation of what constitutes an adverse impact includes an assessment of materiality? What alternatives do you suggest?***

  We consider that it is helpful that there is a pathway addressing "non-compliances" with performance standards by amending the performance standards where the non-compliance is not considered to be material as proposed in section 4.4 of the Guideline.

  We consider the definition of materiality in section 4.4 of the Guideline to be appropriate. We also consider that the examples provided in Appendix C where an individual non-compliance would be material to be helpful, subject to our comments below in Appendix 2.

Conditions on registration

- ***Are the proposed circumstances when conditions on registration could apply appropriate? If not, what alternatives do you suggest?***

- ***Is the list of terms and conditions that could be applied on registration appropriate? Are there terms and conditions that should be removed, or that should be included? Why?***

See detailed comments in section 4 of our Submission.

We consider the initial list of terms and conditions helpful but note that it is essential that section 5 of the Guideline does not preclude further terms and conditions being added which would promote the NEO. In section 5 of our submission, we also recommend AEMO updates, and seeks feedback from, industry on its experience in granting conditions on registration on an informal basis, and that this later is reflected in amendments to the Guidelines.

Appendix 2 – Other feedback

R1 guideline	Comment	Recommendation
Section 4.1 states: *As indicated in Section 3.1.1, it is desirable to incorporate all R1 data into the models used for capability assessment, but it may not always be practical to do so. In cases where some R1 data (including OEM FAT data) is not available, Connection Applicants are encouraged to discuss alternative approaches with AEMO and the NSP during the scoping phase.*	Transformer impedance changes have the highest impact on those performance standards that are dependant upon the BoP impedance (eg S5.2.5.1) so care is required here to not increase the studies workload. ie, undertaking sensitivity studies instead of finalising these studies when the correct information is available. Please note OEM FAT data will generally not be available for incorporation into models for the capability assessment because the FAT happens just before the equipment is shipped to Australia.	Avoid undertaking additional studies if the final information is not available and the results are not expected to be materially affected.
Section 4.1 states: *Where R1 data is not used for simulations supporting the capability assessment, AEMO and the NSP may require sensitivity analysis around uncertainty in modelling inputs to determine the likelihood of a non-compliance and the potential impact should a non-compliance occur.*	The Guideline suggests a sensitivity analysis where R1 data is not used for simulations supporting the capability assessment. This may be a burdensome requirement unless limits are placed on what can be considered. For example, in relation to transformer impedance changes, this is likely to result in tripling the work required. For example, transformer impedance tolerances could be +/- 10 % and NSPs may require studies be completed at these tolerances resulting in three times as many studies required.	To reduce the potential burden of requiring sensitivity analyses, we suggest that the Guideline be amended to make clear that the sensitivity analysis should be: • be limited to realistic conditions based on the NSP's and/or AEMO's experience • only required where the results are expected to be materially affected • a non-compliance has the potential to have a material adverse effect on power system security or quality of supply.
Section 4.2 states: *Where change to performance due to an alteration is small and does not result in*	If an alteration does not result in non-compliance with existing performance	

non-compliance with existing performance standards (such as minor changes attributable to manufacturing tolerances or to accommodate site conditions), a Connection Applicant's proposal to retain the existing relevant performance standard would usually be acceptable, as it would be considered consistent with promoting efficient investment outcomes in the NEM. Simulation studies may be required to confirm compliance and the level of performance change.	standards, what is the reason for changing the existing relevant performance standard? Why is it only "would usually be acceptable"?	We have suggested rewording for this paragraph as follows: *Where change to performance due to an alteration is small and does not result in non-compliance with existing performance standards (such as minor changes attributable to manufacturing tolerances or to accommodate site conditions), a Connection Applicant's proposal to retain the existing relevant performance standard ~~would usually be acceptable~~* ***should be accepted****, as it would be considered consistent with promoting* ***the NEO, including*** *efficient investment outcomes in the NEM. Simulation studies may be required to confirm compliance and the level of performance change.*
Paragraph 6 of Section 4.2 states: *For example, if a developer decides to increase the size of a solar farm by adding more inverters and solar panels, the additional active and reactive power capability would be captured in the NER S5.2.5.1*	What if the inverter OEM is changed (with the project Maximum Capacity unchanged) and the new OEM can meet the same level of performance as the previous inverter? Under this scenario the risk to the power system is unchanged so it would not make sense to require re-negotiate performance.	Replace "size" with 'maximum capacity" in this paragraph
Section 4.4 Treatment of non-compliances Where a non-compliance is identified through the *capability assessment*, action will need to be taken to address the non-compliance. AEMO will work with the relevant NSP and the	Technically a failure for the GS/IRS to meet a performance standard is not a non-compliance at this stage as the generator is not registered nor connected.	By way of clarification, we recommend that the first paragraph of section 4 is amended to read:

Connection Applicant to agree an efficient approach to achieve compliance.	Suggest rephrasing to make clear it is not a non- compliance under NER 4.15 and there is no obligation to lodge a non-complying notice with AEMO.	"This section describes the assessment approach for the *capability assessment*, in accordance with principles outlined in Section 1.1. ***In this Guideline, compliance refers to the capability of the GS/IRS to meet or exceed its performance standards to be eligible for registration.*"**
Partial cloud shading algorithm (solar farms) page 27	The partial cloud shading algorithm seems to be required in all cases based on the Guideline. This requirement will only disincentivise upgrades on old solar farms since many of them cannot add these algorithms without a complete upgrade of the inverters. There is a perception from AEMO and NSPs that the control systems can be easily changed by upgrading the firmware. However, this is not the case most of the time. Some controllers, especially old ones, do not have the physical capabilities that other new ones do.	Delete Partial cloud shading algorithm (solar farms) as an item in Appendix B
Hardware in Loop (HIL) tests HIL test results for FRT and MFRT on page 29 of the Guideline	Requesting HIL tests for site-specific conditions is unrealistic. Some OEMs do not offer this service and will not provide a CHIL setup to proponents.	Delete HIL tests as an item in Appendix B
Appendix A – additional information	Consideration should be given to including SCADA signal list, protection design report, single line diagrams or harmonic filter design in Appendix A. This data is crucial to understanding the overall plant functional behaviour and is normally available when the applicant is in position to submit the initial data.	
Appendix A - Dynamic model changes	The first bullet point on requiring all OEM model version histories and	Delete first bullet point or limit scope to model changes that

Changes to dynamic models of the plant since agreement of *performance standards*. • Provide OEM information about the model changes including the model version history and change log. • Identify all model changes that could impact the *plant's performance standards*. Include a description of each change and how it will impact the agreed *performance standards*.	change logs will be burdensome given there are frequently updates to the model that do not affect a specific project or GPS. The second bullet point, on detailing model changes that could impact the plant's performance standards, will provide enough information for the NSP and AEMO.	could impact the *plant's performance standards* ie those identified in the second bullet point
Appendix B – inclusion of Energy Conversion Model	The Energy Conversion Model is omitted from Appendix B though it is required to obtain Registration and is very linked to the AEMO SCADA signal list. The SCADA signal list is included and we consider that the ECM should also be part of the data. We acknowledge this will be assessed by AEMO Forecasting team that is a different team, but it has often caused delay in obtaining registration, so we recommend its inclusion in Appendix B.	