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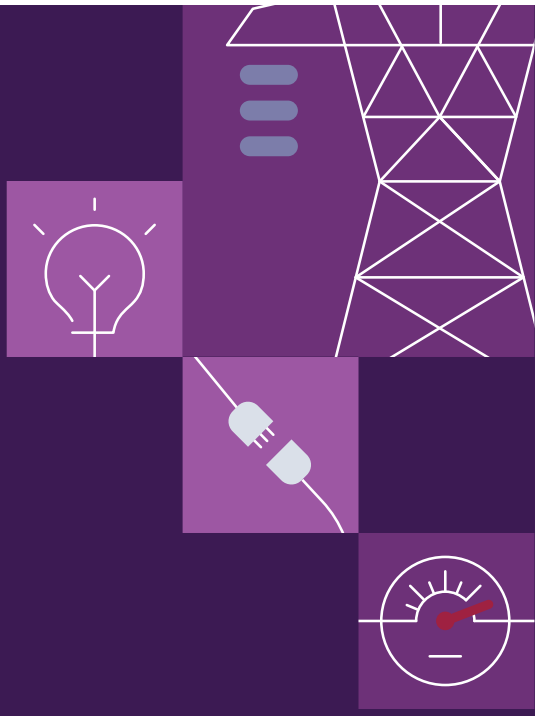

R1 Capability Assessment Guideline

Final Report

Published: 27 June 2025

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New South Wales | Queensland | South Australia | Victoria | Australian Capital Territory | Tasmania | Western Australia
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Executive summary

The publication of this final report concludes the Rules consultation process conducted by the Australian Energy Market Operator (AEMO) on the addition of the R1 Capability Assessment Guideline to the materials that comprise the registration information resource and guidelines (RIRG) under the National Electricity Rules (NER). The RIRG is used to assist applicants for registration who are engaging with AEMO in relation to registration, exemption and classification processes under Chapter 2 of the NER.

AEMO commenced this consultation with the publication of a draft report, draft R1 Capability Assessment Guideline (Guideline), and draft R1 Capability Assessment Form (Form) on 16 April 2025 as a result of the National Electricity Amendment (Enhancing investment certainty in the R1 process) Rule 2024 (R1 process rule)[1]. The consultation followed the expedited rules consultation procedure[2].

This final report sets out AEMO's assessment of the issues raised in stakeholder submissions and outlines the changes AEMO has made to the Guideline and Form in response to feedback, including the following changes:

- Describing the capability assessment to be undertaken in consultation with the Network Service Provider (NSP), focusing on changes since the issue of 5.3.4A/B letter(s)[3] and execution of the connection agreement.
- Clarifying the roles of Connection Applicants, AEMO and NSPs by:
    - Noting that it is the Connection Applicant's responsibility to complete simulation studies except for wide area electromagnetic transient (EMT) studies.
    - Reinforcing that AEMO will consult with NSPs on all matters including quality of supply, conditions on registration, and other non-AEMO advisory matters.
- Clarifying that wide-area EMT studies may be repeated in part or full for changes in the plant and external network conditions.
- Clarifying that controller setting changes that are made to meet or exceed the performance standards will be assessed in accordance with NER S5.2.2.
- Reinforcing that for the capability assessment, Connection Applicants should demonstrate that the plant will meet or exceed its performance standards. However, where a non-compliance is identified through the capability assessment, it will need to be addressed. AEMO will work with the NSP and the Connection Applicant to agree an efficient approach to achieve compliance,
- General wording updates to improve clarity and transparency.

Other issues raised in submissions included:

- Adding a more comprehensive R1 checklist to ensure that all necessary inputs are available at the outset of the process to conduct the capability assessment.

[1] https://www.aemc.gov.au/rule-changes/enhancing-investment-certainty-r1-process
[2] NER 8.9.3.
[3] A letter issued by AEMO to the NSP formalising AEMO's agreement to access standards as a result of NER 5.3.4A negotiations and AEMO response on the proposed system strength remediation scheme under NER 5.3.4B.

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- Lack of information regarding the registration process, including a timely notification of registration outcome and other supporting documentation for registration.
- Adding a prescriptive approach to managing external network changes.
- Amendments to what should be considered in the 5.3.4A\B letter and not as part of the capability assessment considerations.

AEMO has not made any further changes in response to these submissions, either because it decided it was not necessary or appropriate to do so, or because it is beyond the remit of the Guideline and Form to address those matters.

The final Guideline and Form, incorporate the changes summarised above and a number of additional minor drafting amendments and clarifications, are published alongside this document and will come into effect on 27 June 2025.

AEMO is grateful for the contribution of all stakeholders who have participated in this consultation process.

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Stakeholder consultation process

As required by NER 2.1.3(d) and 11.171.2, AEMO consulted on the proposal in accordance with the expedited rules consultation procedure in NER 8.9.3. The consultation timeline is outlined below.

Table 1 Consultation process and timeline

Consultation steps	Dates
Streamlined Connection Process (SCP) R1 Focus Group Workshops	01 August – 12 November 2024
Draft report published	16 April 2025
Submissions due on draft report	16 May 2025
Final report published	27 June 2025

AEMO received 6 written submissions that addressed the Guideline during consultation from Clean Energy Council (CEC), Energy Networks Australia (ENA), Iberdrola, Tesla, TransGrid and Vestas.

Copies of all written submissions (excluding any confidential information) have been published on AEMO's website at https://aemo.com.au/consultations/current-and-closed-consultations/registration-information-resource-and-guidelines

The publication of this final report marks the conclusion of the consultation on the amendments to the Guideline and Form.

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1. Background

1.1. NER requirements

AEMO is required to develop, maintain and publish the registration information resource and guidelines (RIRG) materials[4]. The R1 process rule has introduced a requirement that a description of the process for the capability assessment be included in the RIRG[5]. When making certain amendments to the materials in the RIRG, AEMO is required to consult in accordance with the Rules consultation procedures[6].

1.1.1. Capability assessment

AEMO must include a description of the process for the capability assessment in the RIRG. NER 2.1.3(b)(6) requires that this description include:

- The data and information a Connection Applicant must provide to AEMO and the NSP when making a request that AEMO conduct a capability assessment[7].
- Examples of when AEMO or the NSP may request additional data and information from the Connection Applicant and examples of the data and information that may be provided to satisfy the request.
- How AEMO and the NSP may assess the data and information provided and assess whether the plant has an adverse effect on power system security or quality of supply. This includes the matters AEMO may consider in undertaking that assessment.
- Any other matters AEMO considers relevant to describe the capability assessment process.

1.2. Context for this consultation

The decarbonisation of the NEM requires a significant amount of new renewable generation and energy storage to connect to the power system. The capacity of new renewable generation required is around three times the capacity of the existing fleet of thermal generation that it will replace, while the capacity of new energy storage is around half that again. AEMO's 2024 Integrated System Plan (ISP)[8] forecasts that around 10 GW of coal-fired capacity will retire in the period to 2030 and will be replaced by around 30 GW of utility-scale wind and solar capacity. This new variable renewable energy capacity will need to be firmed by around a further 15 GW of utility-scale energy storage – primarily batteries and pumped hydro. By 2040 these forecasts for new capacity increase to a total of 70 GW and 18 GW respectively.

Consistent with these forecasts AEMO has observed a significant increase in the number of connection applications in recent years. To be able to assess the technical capability and register this increasing number of connections it is essential that the processes to support these activities remain fit for purpose and efficient.

[4] NER 2.1.3(a).
[5] NER 2.1.3(b)(6) and NER 11.172.2.
[6] NER 2.1.3(d).
[7] When describing the data and information to be provided, AEMO is limited to the data and information that is required under the NER, is in connection with the performance standards, or which AEMO otherwise requires to assess whether the plant has an adverse effect on power system security or quality of supply.
[8] AEMO | 2024 Integrated System Plan (ISP).

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Prior to being registered with AEMO, Generators and Integrated Resource Providers (IRPs) need to demonstrate to AEMO and their relevant NSP that their plant to be connected to the network will meet or exceed the agreed performance standards[9]. This involves the connecting party preparing and submitting details and performance of their plant post-detailed engineering design, a suite of technical models and other documentation. This process is referred to as the R1 process and the information required to be submitted under the NER is referred to as the 'Registered Data (R1 pre-connection)' (R1 data).

In June 2024 the AEMC amended the NER to improve the R1 process, remove barriers to registration and clarify the roles and responsibilities of Connection Applicants, AEMO and NSPs. The R1 process rule:

- Adds an explicit process for AEMO's assessment of the capability of a generation system or integrated resource system to meet or exceed its performance standards, referred to as the capability assessment.
- Provides timeframes and other process requirements for steps in that capability assessment, including formalisation of AEMO notifications of the commencement and conclusion of the capability assessment.
- Requires that AEMO provide guidance on the process for the capability assessment within the RIRG.
- Allows the RIRG to include additional data and information, in addition to the R1 data, which must be submitted to AEMO and the NSP, provided those changes are consulted on under the NER.
- Allows AEMO to agree with a Generator or IRP terms and conditions that may apply to registration.

In developing the Guideline, AEMO has endeavoured to give effect to the goal of streamlining the connections process, where this is consistent with the requirements of the NER.

1.3. Effective date of the Guideline

The applicable assessment requirements under the Guideline and Form will apply to connections with a request to conduct the capability assessment made on or after 27 June 2025, or in-progress capability assessments as at that date where the Connection Applicant elects.

[9] NER 2.1B.1(c) and 2.1B.2(b)(4).

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2. Summary of feedback

The key feedback in response to the draft Guideline, draft Form and draft report are summarised in the following table.

No.	Issue	Raised by
1	Initial data and information	CEC, ENA, Iberdrola, Tesla, TransGrid
2	Additional data and information	CEC, Iberdrola, Tesla, TransGrid, Vestas
3	Assessment approach	CEC, ENA, Iberdrola, Tesla, TransGrid, Vestas
4	Conditions on registration	CEC, TransGrid
5	Assessment of adverse impacts	Iberdrola, TransGrid

Section 3 discusses the feedback and presents AEMO's considerations. A summary of the stakeholder answers to AEMO's consultation questions is contained in Appendix B.

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3. Discussion of feedback

3.1. Initial data and information

3.1.1. Issue summary and submissions

A number of submissions raised issues relating to the initial data and information requirements as described in section 3.1 and Appendix A of the Guideline. The main issues related to:

1. The role of the 5.3.4A/B letter(s) in scoping the initial data and information submission.
2. How AEMO should proceed with the capability assessment in the absence of some equipment where factory acceptance test (FAT) data is not yet available.
3. The degree of detail and prescription of initial data and information requirements that should be included in Appendix A.
4. Whether the scope split between AEMO and the NSP is appropriate and helps to further the objective to streamline the connections process.
5. The timing of the kick-off meeting in relation to the initial data and information submission.

Specific aspects of stakeholder submissions on these issues are set out below.

CEC:

> Given the potential uncertainty in the timing of the Connection Agreement's execution, we recommend the wording in Section 3.1 be changed from "since the execution of the connection agreement" to "since the issuance of the 5.3.4A letter."
>
> Avoid undertaking additional studies if final information is unavailable. 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.
>
> Include an indicative timeframe for the kick off meeting and scoping of the capability assessment. Add 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 "Timing of kick off meeting and scoping assessment".
>
> Appendix A - Dynamic model changes: The first bullet point on requiring all OEM model version histories and 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.

ENA:

> Requirements for Initial data and information could better align with AEMO's Generator Connection R1 Submission Checklist. The R1 Capability Assessment Guideline process specifies the Initial data and information which the Applicant is required to submit for AEMO (in consultation with NSPs) to initiate the Capability assessment. The requirements for the Initial data and information submission are specified in Appendix A. While Appendix A captures the requirement to identify changes in the plant from Connection Application to R1 (detailed design) stage, it doesn't include certain data and information which is essential to start the capability assessment. In the experience of NSPs, piecemeal submission of information will lead to delays and rework.

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Iberdrola:

The proposed initial information and data requirements in Appendix A should have further consideration around timing of information availability, specifically around modelling. It is recommended that AEMO and NSPs can still scope the assessment without the models being available, such that the requirements can be provided earlier, and delays can be avoided.

AEMO to set clear guidelines stating the minimum requirements that connection applicants must meet when submitting a complete R1 package, with the expectation that the list will be largely similar to the existing R1 submission checklist.

Unclear how the approach of AEMO and NSP scope splitting improves communication and collaboration if both parties are running studies independently. It may not be appropriate to split the data request within the review timeframe. It is not practical to produce the list of required additional documents within a short timeframe, thereby making the 60-day review timeframe unrealistic. A scoping assessment is fit to advise the required simulation studies; however, this should be completed much earlier in the process.

Tesla:

Tesla notes a section of proposed requirements in the form that are likely to add onerous reporting while not supporting the objectives of the RIRG. In the field, 'Dynamic model changes', the first bullet point on requiring all OEM model version histories and change logs will be burdensome given there are frequently updates to the model that do not affect a specific project or GPS. Tesla suggests that 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.

Additionally, Tesla finds the 'identify any specific known issues' field as redundant, as known issues must be resolved for registration to be completed.

TransGrid:

Section 3.1 states that the "initial data and information requirements focus on changes since the execution of the connection agreement," which can be interpreted as focusing solely on internal changes to the generating system. However, external changes—particularly changes to the surrounding network—should also be considered in the assessments conducted as part of the initial submission package. This is particularly crucial for projects that have a substantial time gap between the 5.3.4A phase and the R1 submission for capability assessment.

TransGrid acknowledges the practicality of using design data in the absence of OEM FAT data to commence R1 capability assessment. However, we suggest the following to be considered: (a) The Guideline should clearly outline what steps Applicants must take to assess the potential impact of using design data instead of FAT data. This should include identifying key parameters where deviations between design and actual performance may occur, conducting sensitivity assessments to evaluate the impact of these deviations on compliance with performance standards in consultation with AEMO/NSP. (b) For certain critical plant components (for example, main transformer FAT reports), conditional registration may only be considered after receiving the FAT data and completing the agreed sensitivity studies. If the outcome of these studies indicates a material risk of non-compliance, conditional registration may not be granted until the impact of the non-compliance is assessed and the path for rectification is agreed between all parties.

In TransGrid's view the initial data and information requirement in its current form (specified in Appendix A) is likely to be inadequate to commence the R1 capability assessment. TransGrid supports the development of a more comprehensive and detailed R1 checklist to ensure that all necessary inputs are available at the outset of the process to conduct the R1 capability assessment. The Connections Applicant should provide the following key information, as a minimum: (a) Changes to the plant since execution of Connection agreement in detail. (b) Where relevant (based on changes from Connection Application to R1), update of Connection application

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package with the R1 (detail design) data as evidence to demonstrate GPS compliance. (c) If any non-compliances to the agreed GPS are observed, evidence to support efforts made to achieve the best possible performance (d) Inclusion of additional information required for Registration which are not provided/available during Connection application stage (for example: Protection Design Report, detailed harmonic assessment and filter design report etc.)

3.1.2. AEMO's assessment

AEMO has sought to clarify potential ambiguities in the application of the R1 process rule by applying the interpretation that best fits AEMO's understanding of its intended objectives. In relation to the issues identified by stakeholders:

1. In line with stakeholder views, AEMO considers that the capability assessment should focus on changes since the 5.3.4A/B letter(s) and execution of the connection agreement. This is to properly account for relevant developments that can affect the assessment of a proponent's ability to meet or exceed their agreed performance standards.
2. A number of submissions were seeking examples around situations where R1 modelling data would not be required, however AEMO did not find this should be included since it is handled during the initial scoping phase on a case-by-case basis. If the final information is not available (e.g. OEM FAT data), AEMO recommends Connection Applicants discuss alternative approaches with AEMO and the NSP before commencing additional studies.
3. AEMO acknowledges there are a range of opinions on what should be included in the Guideline under initial data and information. Through the Guideline, AEMO is aiming to strike a balance between providing an exhaustive list of data and information requirements and a shortened list that is no more onerous than the existing R1 checklist it is replacing. The Guideline aims to ensure the capability assessment process is more efficient and streamlined than the previous approach while avoiding unnecessary delays to achieve R1 completion.

   AEMO does not consider that it is burdensome to provide OEM information about model changes including model version history and change logs. It is best practice to document the changes made from one version of the model to the next. AEMO or the NSP may pick up changes in the models that could affect performance standards, which the Connection Applicant may not have identified. However, it would not be possible for AEMO and the NSP to make this assessment without having access to the full list of changes.

   The initial data and information requirements contain the minimum data and information required to commence and scope the capability assessment. As an outcome of scoping, AEMO and/or NSP will advise the Connection Applicant of any additional data and information required to progress and finalise the capability assessment.
4. An SCP R1 industry workshop was held in September 2024 to address ways to work collaboratively. During the workshop, the focus group agreed on:
   i. Scope and process flow for the capability assessment.
   ii. Requirements to establish an effective project management framework to foster a collaborative working arrangement.
   iii. Scope split between the NSP and AEMO to avoid duplication of work.
5. AEMO considers that the kick-off meeting and scoping of the capability assessment should be held soon after receipt of the data and information submission.

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3.1.3. AEMO's conclusion

Based on its assessment above, AEMO has incorporated the following amendments into the final Guideline. These changes ensure the initial data submission and the scoping for the capability assessment capture the necessary information to commence an efficient assessment of the capability of the plant to meet or exceed its performance standards.

- Provided clarity that initial data and information requirements should focus on relevant changes since the issue of 5.3.4A/B letter(s) and execution of the connection agreement.
- Added a recommendation to avoid undertaking additional studies prior to discussing with AEMO and the NSP if the final information is not available.
- Added that the Connection Applicant should engage with the NSP to obtain the latest network information prior to preparing studies for R1 capability assessment in Section 2.3 of the final Guideline. Appendix A and the R1 Capability Assessment Form are updated to note that any simulation studies carried out to demonstrate resolution of conditions in a 5.3.4A/B letter should be carried out in a single machine infinite bus (SMIB) model. Any studies requiring wide-area PSS®E simulations should not be carried out prior to obtaining latest network information to avoid repetition of work.
- Added that, in order to facilitate a timely outcome, AEMO recommends a kick-off meeting between all parties to be organised promptly after AEMO confirms that the capability assessment has commenced.
- Replaced the term "dynamic model(s)" with "model(s)" in Appendix A of the final Guideline and R1 Capability Assessment Form.

3.2. Additional data and information

3.2.1. Issue summary and submissions

A number of submissions raised issues relating to the additional data and information requirements described in section 3.2 and Appendix B of the Guideline. The main issues related to:

1. The scope of data requirements described in Appendix B and whether it is too broad or contrary to the intent of the rule change.
2. The role of simulation studies in the capability assessment, the circumstances when simulation studies will be required and who will conduct them, and the data and information requirements to support those studies.
3. Suggestions for specific additional data and information items.

Specific aspects of stakeholder submissions on these issues are set out below.

CEC:

> We consider that the requirements listed in Appendix B should not be more onerous than those currently required for R1 assessments, and the additional items should be removed.
>
> Recommend that section 3.2 of the Guideline be amended to outline the full requirements of NER 5.3.7A(g) and (h) and 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

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Connection Applicant must be "with reference to relevant requirements of the registration information resource and guidelines," not merely the requirements of the NER.

Suggest an 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.

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.

ENA:

Table 3 in Section B.2 would benefit from clarity on the instances where simulation results and/ or technical notes are required. Table 4 in Section B.3 be reviewed to consider whether there are any additional support documentation requirements that are in fact mandatory and worthy of inclusion in Table 3. For example, schematics showing the protection details and measurements and monitor locations.

Iberdrola:

The proposed additional information and data requirements in Appendix B appears to be more onerous than before the rule change. The objective of a change in the R1 document checklist was to minimise the unnecessary study time and cost, as well as set clear expectations to avoid open-ended delays.

It would be helpful for the guideline to provide clearer direction on the timing for submitting additional information requirements. This would assist proponents in planning and preparing the necessary documentation in a timely manner.

Tesla:

Tesla encourages revising section 3.2.1's ability to request additional simulation studies in the RIRG, adding to the existing comprehensive connection process modelling requirements, as this may delay the process, countering streamlining objectives.

TransGrid:

Additional data and information section would benefit from greater clarity regarding its intent. Specifically, whether it is intended to provide guidance to Applicants on their obligations or offer transparency to the industry about AEMO's process for capability assessment. If the purpose is to specify requirements for Applicants, the language should be revised. Currently, the section lacks clarity on who is responsible for conducting the required studies. Our understanding is that the capability assessment refers to AEMO's review of the R1 information and studies submitted by the Applicant.

Move some of the items from the additional data and information required to initial data and information, specifically (a) GPS Compliance Assessments (in the form of a revised Connection Study Report), (b) Dynamic Model Acceptance Testing (DMAT), and (c) Updated Harmonic Assessment Report.

Add a few other items to this checklist, namely commissioning plan and PSDS.

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Appendix B.4 does not appear to add much additional guidance upon section 3.2.1 of the Guideline. Unless there is an intent to provide more guidance on specific compliance studies requirements here, we suggest removing.

Vestas:

In Table 3 (Appendix B), the wording under the “Local limit implementation detail” should be improved to avoid different interpretation. It is not clear if it is referring to creating new PQ charts for variations based on equipment availability or is restricting P for variations to meet fixed a GPS Q.

Suggest adding grid impedance scan results at different equipment terminals, such as STATCOM and WTG for harmonic/oscillation risk, as well as STATCOM out of service with a clearly defined scope for what studies would be required.

3.2.2. AEMO’s assessment

AEMO has sought to clarify potential ambiguities in the application of the R1 process rule by applying the interpretation that best fits AEMO’s understanding of its intended objectives. In relation to the issues identified by stakeholders:

1. AEMO acknowledges there are a range of opinions on what should be included in the Guideline under additional data and information. AEMO is looking to achieve balance between providing an exhaustive list of requirements and frameworks, and a shortened list that is no more onerous than the R1 checklist that the Guideline will supersede. The Guideline aims to ensure the capability assessment process is more efficient and streamlined than the previous approach while avoiding unnecessary delays to achieve R1 completion.

   AEMO acknowledges that additional data and information items in Appendix B are not all mandatory. Items such as cloud shading algorithm, hardware in loop tests, and local limit implementation detail may or may not be required. The additional data and information that will be required will be identified on a case-by-case basis as an outcome of the scoping stage.

2. AEMO acknowledges that the Guideline does not prescribe specific simulation studies to support the capability assessment. However, it is important to note that some simulation studies may be required.

   The objective of the Guideline is to minimise the unnecessary study time, cost, and open-ended delays. AEMO considers that studies should only be required in respect of those aspects of the performance standard affected by the changes to the plant or the relevant external changes since the issue of the 5.3.4A/B letter(s). Section 3.2.1 of the Guideline provides guidance on when studies are likely to be required and AEMO considers it is not practicable to restrict the requirement for studies further.

   To clarify, the Guideline does not mandate additional studies, but instead seeks to establish a scope of work that is suitable considering the range of factors set out in section 2.2.2. It reflects a significant departure from the previous "one size fits all" approach to specifying studies.

3. AEMO has considered that impedance scan studies may be useful in some circumstances (such as to examine the impact of changes to the external network or generation on stability).

4. To clarify, the Guideline does not determine the performance standards. For example, in relation to local limits in Appendix B of the Guideline, it only explains how the local limits may be used. The

relationship between active and reactive power for various plant deratings was a topic covered in the recent technical standards rule change[10].

3.2.3. AEMO's conclusion

Based on its assessment above, AEMO has incorporated the following amendments into the final Guideline. These changes ensure that the additional data and information requirements are focussed on what is needed to conduct the capability assessment for the specific plant in question, rather than a one-size-fits-all data request:

- Reworded section 3.2.1 to emphasise that it is the Connection Applicant's responsibility to complete simulation studies except for wide area electromagnetic transient (EMT) studies.
- Added a footnote in section 3.2.1 mentioning use of impedance scans in the context of external changes.
- Added clarity on when an updated Dynamic Model Acceptance Test (DMAT) report (in full or partial) may be required in Appendix B.
- Items in relation to schematics showing protection detail and measurement and monitoring locations have been moved from Table 4 in Appendix B.3 to Table 3 in Appendix B.2.
- Updated the last paragraph of Section 3.2.1 to include changes in the external network conditions (for example where a significant time period has lapsed between the issue of 5.3.4A/B letter and capability assessment).
- Added a footnote in Section 4.1 noting that AEMO and the NSP may require sensitivity analysis around uncertainty in modelling inputs focused on realistic conditions to determine the likelihood of a non-compliance and the potential impact should a non-compliance occur, where some R1 data is not used.
- Added a footnote on the cost recovery and timeline implications of extra studies.

3.3. Assessment approach

3.3.1. Issue summary and submissions

A number of submissions raised issues relating to the assessment approach described in section 4 of the Guideline. The main issues related to:

1. The responsibility of NSPs for ensuring quality of supply and how this is addressed in the capability assessment process.
2. Clarity of the circumstances where R1 modelling data would not be required to allow AEMO to conduct the capability assessment.
3. Alignment and potential overlap between the Guideline and AEMO's NER 5.3.9 Process Guideline[11].
4. Clarity around what constitutes small versus large alterations and the relationship to acceptable manufacturing tolerances.

[10] https://www.aemc.gov.au/rule-changes/improving-nem-access-standards-package-1
[11] AEMO | Altering a generating system or integrated resource system – NER 5.3.9 Process

5. Whether the Guideline places sufficient emphasis on the need for Connection Applicants to demonstrate their ability to meet or exceed performance standards versus measures to address any non-compliances identified.

Specific aspects of stakeholder submissions on these issues are set out below.

CEC:

> 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.
>
> Paragraph 2 of section 4.2 states: 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, 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. If an alteration does not result in non-compliance with existing performance standards, what is the reason for changing the existing relevant performance standard? Why is it only "would usually be acceptable"? We suggest rewording for this paragraph.
>
> 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. Suggest replacing "maximum capacity" with "size".
>
> Sensitivity analysis should be limited to realistic conditions based on experience. 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 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, and note a non-compliance has the potential to have a material adverse effect on power system security or quality of supply.

ENA:

> Quality of Supply is a matter to consult with NSPs on. Section 4.4. of the Draft Guidelines makes observations around harmonics, where emissions are noncompliant. NSPs hold the primary responsibility for maintaining the quality of supply in the network. Generator/IRP technical standards related to power quality in the NER are not advisory matters for AEMO.
>
> Section 4 provide examples of when applicants could proceed without incorporating all R1 data into the capability assessment model. Section 4.1 of the Draft Guidelines describes an alternative pathway for progressing a connection application when R1 data has not been included in the capability assessment model. ENA would welcome some examples of what types of applicants or situations could proceed without providing modelling data.
>
> The Draft Guidelines would benefit from a greater focus on meeting or exceeding agreed performance standards, rather than alternative pathways. Make it clearer that meeting or exceeding the agreed performance standards should remain the key responsibility of Connection Applicants. If any material non-compliances are identified during the assessment, Applicants should take necessary steps to rectify them as much as possible.

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Iberdrola:

> Add a process explicitly established in the guideline to ensure consistency around the methodology for assessing "adverse impacts" and principals for identifying issues, with examples.

Tesla:

> Tesla strongly endorses the proposal in section 4.2 of the RIRG that 'for large alterations, only those performance standards impacted by the alteration would be renegotiated.' Tesla sees this having enormous benefits in improving the efficiency and timeliness of the connection process. A clarification within this recommendation is defining what is deemed as a large alteration.

TransGrid:

> Provide links or reference to NER 5.3.9 in section 4.2. Some descriptions in this section overlaps with AEMO's NER 5.3.9 Process Guide. Therefore, we suggest providing reference to the 5.3.9 Process Guide for the approach applicable to plant alterations that occurs in parallel to Registration assessments.
>
> This section is titled "Assessment Approach"; however, it primarily focuses on capability assessment approaches for some specific scenarios involving plant alterations, non-compliances or where R1 data may not have been utilised for the assessment. TransGrid notes that clarifying AEMO's standard R1 capability assessment approach for projects would be more beneficial.
>
> As noted in this section, if AEMO (and NSP) have to conduct additional studies to confirm whether the altered performance at R1 stage would impact system security, it will have implications on cost and project timelines.
>
> TransGrid supports AEMO's consideration of approaches to non-compliances and plant alterations during Registration stage. However, we are concerned that the Guideline may understate the Connection Applicant's accountability for meeting agreed performance standard levels and risks undermining the integrity of the 5.3.4A negotiation process.

Vestas:

> Some NSPs do not permit any tolerance at the connection phase. For example, main transformer impedance tolerances are defined in standards. It should be standard practice to allow generators to account for these tolerances during the connection application phase to ensure realistic and achievable performance assessments.
>
> How are fine tunings of converter parameters categorized and assessed? If compliance with the agreed performance standards is demonstrated through studies, would that be sufficient to approve the proposed changes? A clear framework is needed to determine when study-based evidence is adequate for approval, especially for minor tuning adjustments.

3.3.2. AEMO's assessment

AEMO has sought to clarify potential ambiguities in the application of the R1 process rule by applying the interpretation that best fits AEMO's understanding of its intended objectives. In relation to the issues identified by stakeholders:

1. AEMO acknowledges that quality of supply is a matter to consult with NSPs on while also noting the NER requires AEMO to be satisfied the plant will meet or exceed all of its performance standards. AEMO will consult with NSPs on all matters including quality of supply.
2. The Guideline notes that for projects 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. Several submissions requested AEMO to include examples

relating to situations where R1 modelling data would not be required. AEMO does not consider it appropriate to include these types of examples as they are project specific and are best managed during the initial scoping phase on a case-by-case basis.

3. Where NER 5.3.9 applies to plant alterations it is important that Connections Applicants refer to the NER 5.3.9 Process Guideline. In line with stakeholder comments, AEMO considers it is beneficial to provide additional links to NER 5.3.9 documents where appropriate.

4. AEMO also notes that the NER does not have a definition for what constitutes a small or a large alteration. AEMO does not intend to develop such a definition in the Guideline.

5. AEMO acknowledges the risk of non-compliance resulting from small impedance changes because of manufacturing tolerances and small changes to cabling to account for site conditions may be mitigated by allowing for reasonable tolerances at the connection application phase and notes that this was included in the draft Guideline.

   AEMO notes that the intention of the approach to non-compliance and plant alterations is not to relieve Connection Applicants of their obligations to meet their agreed performance standards. Where the assessment identifies a non-compliance, it should follow a pragmatic approach to assess if the deviation in performance is material and determine the appropriate pathway for resolution.

3.3.3. AEMO's conclusion

Based on its assessment above, AEMO has incorporated the following amendments into the final Guideline. These changes are to ensure the capability assessment remains focussed on the ability to meet or exceed performance standards and where non-compliances are identified these are addressed in the most efficient manner possible under the NER.

- Added a sentence into the section on Assessment Approach under Section 4.3, subsection Quality of Supply, which acknowledges that AEMO will consult with the relevant NSP regarding the capability assessment on matters associated with quality of supply.
- Added a footnote to Appendix C to state that AEMO will consult the relevant NSP on all matters, including quality of supply.
- Added specific references to NER 5.3.9 documentation throughout the document.
- Replaced "large alterations" with "larger alterations" in paragraph 3 of section 4.2 to emphasise that a larger change is relative to the small alterations discussed in the previous paragraphs. Amended paragraph 2 of section 4.2 to reflect this change.
- Replaced maximum capacity with size in paragraph 6 of section 4.2.
- Added a footnote to reinforce that sensitivity analysis should be limited to realistic conditions based on the NSP's and/or AEMO's experience.
- Included a section (section 4.3) on assessment of settings changes.
- Added a sentence to section 4.5 to reinforce that Connection Applicants should demonstrate their plant's compliance with its agreed performance standards. Additionally, noting that where a non-compliance is identified, it will need to be addressed considering its materiality. A range of options to address non-compliances are included in this section. AEMO will work with the relevant NSP and the Connection Applicant to agree an efficient approach to achieve compliance.

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3.4. Assessment of adverse impacts

3.4.1. Issue summary and submissions

A number of submissions raised issues relating to the assessment of adverse impacts described in section 4.4 of the Guideline. The main issues related to:

1. A need for greater prescription around the definition of what constitutes adverse power system impacts.
2. Definitions to support the interpretation of certain terms used in the Guideline.
3. Clarify that Appendix C contains examples of scenarios rather than conditions.
4. Negotiations of a materiality threshold for performance standards.
5. Whether the guidance on adverse impacts of quality of supply could lead to inequitable treatment of future connections based on site specific conditions and measurements.
6. Recognise the NSPs role and obligations in managing quality of supply.

Iberdrola:

> Need definition of terms in Appendix C. Add a list of definitions to support the interpretation of the terms. Some terms include “Reasonably anticipated conditions,” “Realistic cumulative impacts”, “Adequately damped”, “Brief excursions outside NOFB and NOFEB”, and “Secure state”.
>
> Negotiation of a materiality threshold will remove barriers for registration for projects with performance standards lower than the NAS. Suggest parties can negotiate a materiality threshold to remove barriers for registration of projects with performance standards lower than the NAS in their GPS.
>
> Suggest expanding the Appendix C table to include which of the parties will be responsible for assessing each system impacts, such that the split of scope is clear.
>
> No mention of NSPs or AEMO suggesting remedies to system security risks is present in the guideline. No obligation is placed on AEMO/NSPs to propose solutions to system security risks, unlikely that there will be a change in approach following this rule change with the current drafting. Assessment using a risk-based analysis and formalised materiality guidelines, where all parties seek to develop sensible engineering approaches to manage risks and enforce based on potential impact and probability of issue occurring.

TransGrid:

> TransGrid suggests updating the column heading of column 4 to “Examples of scenarios that AEMO considers would reflect an adverse impact” instead of “Examples of conditions that AEMO considers would reflect an adverse impact” as the word “condition” could lead to confusion.
>
> For Appendix C, we recommend reinforcing the importance of other key items which include preserving adequate headroom in harmonic allocations, recognising the NSP’s role and obligations in managing quality of supply, and avoiding practices that could lead to inequitable treatment of future connections.
>
> There are often notable discrepancies between modelled outcomes and actual site measurements of harmonic voltage distortion. These differences highlight the need to maintain sufficient margins when making decisions at the registration stage based on study results.

3.4.2. AEMO's assessment

AEMO has sought to clarify potential ambiguities in the application of the R1 process rule by applying the interpretation that best fits AEMO's understanding of its intended objectives. In relation to the issues identified by stakeholders:

1. While Appendix C of the Guideline contains several example scenarios that describe adverse impacts on power system security and quality of supply, AEMO has not proposed a prescriptive approach. This is to allow for a fit for purpose assessment considering site specific attributes of a connection.
2. AEMO acknowledges the importance of using a glossary for any terms defined in the NEL and the NER, as well as explaining any abbreviations used in the Guideline. It does not appear that the particular terms requested have a definition in the NEL and NER and so they should be given their ordinary meaning.
3. AEMO acknowledges that Appendix C is referring to examples of scenarios that AEMO considers would reflect an adverse impact rather than conditions.
4. AEMO considers that negotiation of materiality thresholds during the NER 5.3.4A access standard negotiations would not be efficient and may increase NER 5.3.4A approval timeframes
5. AEMO does not consider that the guidance in relation to assessing adverse impact in quality of supply would lead to inequitable treatment of other connections as AEMO considers that non-compliances due to harmonic emissions should be addressed based on its materiality. This is presented in Section 4.4 and Appendix C of the Guideline.
6. AEMO will carry out the capability assessment in consultation with the NSP while also noting that the NER requires AEMO to be satisfied the plant will meet or exceed all of its performance standards.

3.4.3. AEMO's conclusion

Based on its assessment above, AEMO has incorporated the following amendments into the final Guideline. These changes are to clarify how AEMO will assess adverse impacts on the power system generally as well as the specific circumstance of adverse impact on quality of supply.

- Replaced the heading of column 4 to refer to scenarios rather than conditions.
- Added a footnote noting that AEMO will consult the relevant NSP on all matters, including quality of supply.

3.5. Conditions on registration

3.5.1. Issue summary and submissions

A number of submissions raised issues relating to the conditions on registration described in section 5 of the Guideline. The main issues raised sought changes to clarify that:

1. AEMO will consult with the relevant NSP regarding the terms and conditions of registration, and at the time of assessment to confirm whether the condition has been satisfied within the timeframe specified. This is particularly important for non-AEMO advisory matters and for issues that may have potential implications for NSP's obligations in planning and operating the network

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2. The Guideline is non-prescriptive and non-exhaustive in considering conditions on registration and that conditions are likely to evolve over time.

CEC:

> Amend section 5 of the guideline clarifying that it sets out a non-exhaustive list of terms and conditions given 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.
>
> Amend the first sentence of section 5.1 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 (sic) 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.
>
> Amend Section 5.2 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"
>
> Amend the second sentence of section 5.3 to read: "AEMO 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.
>
> Amend paragraph 2 of section 5.3 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.

TransGrid:

> While we acknowledge that, under the NER, AEMO holds the primary responsibility for issuing conditional registration, it is strongly recommended that AEMO consult with the relevant NSP both at the time of introducing the terms and conditions of registration, and at the time of assessment to confirm whether the condition has been satisfied within the timeframe specified. This consultation is particularly important for non-AEMO advisory matters and for issues that may have potential implications for the NSP's obligations in planning and operating the network.
>
> Section 5 bullet points 10 and 11 have the potential to cause confusion, reword. Harmonic and flicker emissions of generating plants are not assessed against planning levels, but rather against the emission limits allocated by the NSP.
>
> For Section 5, it is strongly recommended that the Guideline explicitly state the typical process of AEMO consulting with the NSP when setting or closing out registration conditions–particularly for quality of supply matters. Since the primary responsibility for maintaining quality of supply lies with the NSP, it is essential that the NSP be satisfied with any conditions related to harmonic or flicker emissions.

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3.5.2. AEMO's assessment

AEMO has sought to clarify potential ambiguities in the application of the R1 process rule by applying the interpretation that best fits AEMO's understanding of its intended objectives. In relation to the issues identified by stakeholders:

1. In line with stakeholder views, AEMO considers that consultation with NSPs at the time of introducing terms and conditions, and at the time of the assessment to confirm whether the conditions have been satisfied is important for the NSP's obligations in planning and operating their network.
2. AEMO acknowledges that conditions on registration are likely to evolve over time based on experience and the evolving nature of the power system.

3.5.3. AEMO's conclusion

Based on its assessment above, AEMO has incorporated the following amendments into the final Guideline. These changes are to ensure any proposed conditions on registration are appropriate for the circumstances and that their use is able to adapt to different circumstances:

- Removed conditions in section 5.2 (nature of terms of conditions) associated with quality of supply to avoid confusion.
- Added clarity on roles and responsibilities for conditions on registration.
- Amended multiple paragraphs in section 5 to align with the above assessment.

4. Glossary

Term or acronym	Meaning
AEMC	Australian Energy Market Commission
capability assessment	AEMO's assessment of the capability of a generating system or integrated resource system to meet or exceed its performance standards
CEC	Clean Energy Council
conditions on registration	The terms and conditions AEMO may agree with a Generator or IRP in relation to registration
Connection Applicant	A Connection Applicant seeking to register as a Generator or Integrated Resource Provider
CRI	Connections Reform Initiative
DMAT	Dynamic model acceptance test
EMT	Electromagnetic transient
ENA	Energy Networks Australia
FAT	Factory acceptance test
Focus Group	SCP – R1 focus group convened under the CRI
Form	R1 Capability Assessment Form
Guideline	R1 Capability Assessment Guideline
IRP	Integrated Resource Provider
ISP	Integrated System Plan
NER	National Electricity Rules
NEO	National electricity objective
NSP	Network Service Provider

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Term or acronym	Meaning
R1 data	Registered data (R1 pre-connection)
R1 process rule	National Electricity Amendment (Enhancing investment certainty in the R1 process) Rule 2024
Request Form	R1 Capability Assessment Request Form
RIRG	Registration information resource and guidelines
SCP	Streamlined Connection Process

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Appendix A. Summary of stakeholder answers to consultation questions

No.	Question	Responses
1	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. 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 (e.g. HIL tests) or requirements which may be contrary to the NEO insofar as it disincentivises upgrades to plant (e.g. partial cloud shading logarithms). 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, and 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 i.e. the documents in Appendix A and the subset of documents in Appendix B which are identified following the scoping assessment. • Iberdrola: No, we believe this is not appropriate to split the data request within the review timeframe. It is not practical to produce the list of required additional documents within a short timeframe, thereby making the 60-day review timeframe unrealistic. We support the concept of a scoping assessment to advise the required simulation studies, however this should be completed much earlier in the process. • TransGrid does not consider the proposed approach to be the most efficient and effective. While the concept of submitting a subset of data to initiate the R1 capability assessment may help commence work earlier, staggered or piecemeal submission of information risks introducing delays to the overall process. Based on TransGrid experience, most Applicants operate under tight timeframes for achieving registration. Therefore, submitting a complete package–where feasible and based on availability of information–from the outset remains the most efficient approach. If flexibility is required, the Guideline should encourage early engagement with AEMO and the NSP. This would allow the Applicants to discuss the potential deferral of specific items and align expectations. Early engagement benefits all parties by: - Clarifying process requirements and timelines. - Allowing AEMO and the NSP to understand data availability and project milestones. - Helping Applicants use the latest network information and plan submissions to avoid rework; Identifying opportunities to reuse or reduce the scope of studies, provided there are no material changes in performance. In summary, while flexibility is valuable, a structured and complete initial submission–supported by early stakeholder engagement–is more likely to ensure timely and efficient capability assessments. • Vestas: Yes, it is appropriate. The scope of work must be clearly defined to ensure the registration process is not affected by unexpected requirements. Having the work divided into two or more parts shouldn't pose any issues, as long as the expectations at each stage are clearly outlined and the scope remains consistent throughout.

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No.	Question	Responses
2	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. • Iberdrola: Yes, the process should be standardised in order to more efficiently register projects. We believe the following items should be explicitly established in the guideline to ensure consistency: - The split of scope between the NSP and AEMO for each study area - Examples of how the scope of the capability assessment would be determined, similar to the proposed "types" in the original rule change request - Methodology for assessing "adverse impacts" and a principle for identifying issues, with examples - The process for negotiating performance standards below the previously agreed NAS. • TransGrid: We believe there are pros and cons to a more prescriptive process. Historically, the R1 process has not been well defined in the National Electricity Rules (NER), particularly prior to the recent Rule change. We support the development of a more clearly articulated process that outlines: - The general obligations and expectations for R1 submissions from Applicants. - The criteria and considerations AEMO and NSPs will apply when conducting the R1 capability assessment. A well-defined process would better align with the National Electricity Objective (NEO) by promoting transparency, predictability, and efficiency in the connection process. It would also help ensure consistent treatment of Applicants and reduce the risk of delays caused by unclear requirements. However, it is important to note that an overly prescriptive process may inadvertently limit the use of engineering judgment. Flexibility is often required to account for project-specific circumstances, the unique needs of the connecting location, and jurisdictional differences (for example, transmission vs. distribution). A rigid framework could lead to suboptimal outcomes in cases where tailored solutions are more appropriate. We also believe that more guidance on the technical requirements for assessing access standards would promote efficiency in the process. Although this is currently outside the scope of the Guideline, such guidance would improve the quality of submissions, enhance the tuning and performance of plant connected to the system leading to reduced assessment and approval times. This could be achieved by updating AEMO's Access standard Assessment Guide – Jan 2019 to reflect the latest NER requirements, industry practices and considering integration of new and emerging technologies. • Vestas: Yes, implementing a more prescriptive capability assessment process would be more appropriate as it would limit the scope of what AEMO and NSP can request, avoiding different interpretations and unexpected issues later in the project. Appendix B should state the full list of additional data and information requirements and why they would be needed. The consultation paper leaves plenty of room for AEMO and NSP to change the scope at any time during the capability assessment and it does not mention whether those requests are also limited to the appendix B list, as follows: "As the capability assessment is carried out AEMO or the NSP may identify additional issues that were not considered when the scope of the capability assessment was developed. In these circumstances AEMO or the NSP may request further clarifications and/or data and information, depending on the findings of the assessment." Ideally, this assessment could be defined early on—potentially even at the R0 stage—based on the specific design of the project. While compliance assessments are already well established within the industry, there are additional operational scenarios that often necessitate further capability assessments. These typically include:

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No.	Question	Responses
		- STATCOM and out-of-service scenarios - Harmonic filters, capacitor banks, or shunt reactors in out-of-service conditions - Main transformers in out-of-service scenarios - Variations in the number of online turbines - 33kV feeders and their out-of-service scenarios Clearly accounting for these situations in the initial capability assessment would provide greater certainty and reduce the risk of delays or redesigns. However, some level of flexibility should be available to deal with dynamic adjustments on STATCOM control modes, for example.
3	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. • Iberdrola: Yes, it is sufficient that only the changes are captured in the data request. • TransGrid: While consideration of changes to the plant is a key driver, we do not believe that focusing solely on these changes in the initial submission will result in an efficient or effective assessment process. For further detail, please see Section 1 – Initial data and information requirement. Importantly, the Guideline currently does not mention the need for the Applicant to consult with the relevant NSP (and AEMO) prior to preparing their initial R1 submission. This consultation is critical to obtain latest Network information which should be considered for R1 studies. Relevant network-related input may include newly committed generators, network augmentation, fault level information, updated line ratings, network constraints etc. This input should be considered in determining whether certain studies need to be updated for R1 submission. Additionally, we recommend that the Guideline provide greater clarity on items that are necessary for Registration but may lie outside the scope of AEMO's R1 capability assessment. For further detail, please refer to Section 3 – Clarity on Role of Capability Assessment within the R1 Framework. • Vestas: Yes, this is appropriate. Quantifying the changes is the first step in defining the scope for the R1 Capability Assessment. However, for hybrid systems (Wind + STATCOM + BESS), the control interaction risks should still be assessed, even if both systems were previously approved separately.
4	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. • Iberdrola: There should be further consideration around timing of information availability. We believe it is possible to scope the assessment without the models being available, such that the requirements can be provided earlier, and delays can be avoided. • TransGrid: We believe that the proposed requirements in Appendix A provide a good basis for understanding changes to the plant between the Connection Applicant stage and the R1 stage. However, it does not contain sufficient information for initiating and completing the R1 capability assessment. For further detail, please refer to Section 1 – Initial data and information requirement. • Vestas: Yes, it is appropriate.

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No.	Question	Responses
5	Is the proposed Request Form suitable to support the submission of the initial information and data?	• CEC: Yes. • Iberdrola: Yes, the format of the form is suitable. • Vestas: Yes, it is appropriate.
6	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?	• CEC: 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). • Iberdrola: Appendix B outlines a range of additional information that appears to be more onerous than prior to the rule change. The objective of a change in the R1 document checklist was to minimise the unnecessary study time and cost, as well as set clear expectations to avoid open-ended delays. To support a more efficient and transparent assessment process, it would be helpful for the guideline to provide clearer direction on the timing for submitting additional information requirements. This would assist proponents in planning and preparing the necessary documentation in a timely manner. Furthermore, providing a written rationale for the inclusion of each information requirement – particularly where the need may vary across different project types would improve understand of its relevance to the capability assessment. In some cases, the requested documents appear to extend into areas more appropriately managed by the generator and overseen through the compliance framework. Greater clarity in this regard would help ensure that responsibilities are appropriately allocated and that information requests remain targeted and proportionate • TransGrid: We prefer the inclusion of a comprehensive list of information or studies that may be requested by AEMO and the NSP, as this promotes transparency and helps Applicants better prepare for the R1 capability assessment. This approach is preferable to the more limited and less defined method currently proposed in the Guideline. We believe that certain items specified in Appendix B should be considered part of the initial data and information. Relying on a staggered approach to information provision, particularly where that information can impact the demonstration of GPS compliance, can introduce risks and may lead to unnecessary delays. • Vestas: Some of the content in Appendix A and Appendix B is complementary—for example, the GS/IRS models in Appendix A and the models and user guides in Appendix B. It would be helpful to clarify the rationale behind separating this information across the two appendices to avoid confusion and ensure consistency. In addition, we suggest adding grid impedance scan results at different equipment terminals, such as STATCOM and WTG for harmonic/oscillation risk, as well as STATCOM out of service with a clearly defined scope for what studies would be required. In Table 3 (Appendix B), the wording under the “Local limit implementation detail” should be improved to avoid different interpretation: is it referring to creating new PQ charts for

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No.	Question	Responses
		variations based on equipment availability? Or is it restricting P for variations to meet fixed GPS Q? Vestas supports the first option.
7	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?	• Vestas: Yes, it is appropriate. It is standard practice to assess compliance at the registration stage using as-built data. Modelling and analysis are essential tools for quantifying and verifying compliance with the GPS requirements, as well as for identifying and addressing any non-compliances. • CEC: 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. • Iberdrola: Yes, we believe the list of example conditions is appropriate, however the terms used have not been defined. We suggest a list of definitions be attached to support the interpretation of the terms. Some terms include: - "Reasonably anticipated conditions" - "Realistic cumulative impacts" - "Adequately damped" - "Brief excursions outside NOFB and NOFEB" - "Secure state" • TransGrid: Appendix C references the relevant NER System standards (S5.1a) that may be impacted by the non-compliance with corresponding GPS access standard and suggests the system standards to be the criteria for considering amendments to the GPS (outlined in Section 4.4 of the Guideline). While this is a valid consideration, we believe that there are additional factors such as local network constraints, the impact of multiple non-compliances in a region etc., that may need to be considered when determining whether an amendment is appropriate.
8	Is it appropriate that AEMO's interpretation of what constitutes an adverse impact includes an assessment of materiality? What alternatives do you suggest?	• CEC: 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 in Appendix 2. • Iberdrola: We support the concept of materiality, however, remains unclear how this will practically be assessed. The example provided is too simplistic and does not allow generators to anticipate the materiality of any adverse impacts caused by their connection. • TransGrid suggests that adverse impacts should also consider plant performances that pose a risk for the relevant NSP to meet system standards. • Vestas: Yes, it is appropriate. This is especially important for hybrid system, where small deviations may have little impact, but poor damping or improper coordination can lead to significant voltage or oscillation issues across the system. Therefore, materiality should be assessed not only by the magnitude of the deviation but also by its potential to cause dynamic instability.
9	Are the proposed circumstances when conditions on registration could apply appropriate? If not, what alternatives do you suggest?	• Iberdrola: Yes, we believe they are appropriate.

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No.	Question	Responses
		• Vestas: There are situations that may impact the commissioning of plants, such as technical issues or non-compliance's. However, the proposed terms and conditions can provide flexibility, allowing generators to proceed with commissioning activities while addressing these issues in parallel.
10	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?	• Vestas: Yes, they are appropriate. Having clearly defined terms and conditions supports generators when dealing with technical issues or non-compliances. This flexibility can enable projects to continue progressing rather than being halted, which often leads to significant delays. Ideally, these scenarios and their corresponding conditions would be predefined. However, it's also understood that such situations can be complex, highly situational, and specific to each project. • CEC: 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. • Iberdrola: Yes, we believe they are appropriate. • TransGrid: The list of terms and conditions outlined in Section 5.2 generally provides a comprehensive and appropriate set of scenarios under which conditions may be applied at registration. However, our main concern is the lack of reference to consultation with the connecting NSP. It is strongly recommended that AEMO consult with the NSP both: - At the time of introducing conditions during registration, and - At the time of assessment to confirm whether the condition has been satisfied within the timeframe specified. As currently worded, the Guideline could be interpreted as giving AEMO sole authority to impose and close out conditions, without requiring input from the NSP. This could lead to misalignment or delays, particularly for non AEMO-advisory matters, NSP-specific requirements or network impacts are involved. Additionally, we note that some items in the list–particularly those related to quality of supply, such as conditions related to harmonics–require further clarification.

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