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28 September 2023

Ms Anna Collyer
Chair
Australian Energy Market Commission (AEMC)

Via electronic lodgement

Dear Ms Collyer

Enhancing investment certainty in the R1 process [ERC0363]

AusNet welcomes the opportunity to make a submission in response to the AEMC's Enhancing investment certainty in the R1 process Consultation Paper (the R1 Consultation Paper).

AusNet is the largest diversified energy network business in Victoria with over $11 billion of regulated and contracted assets. It owns and operates three core regulated networks: electricity distribution, gas distribution and the state-wide electricity transmission network, as well as a significant portfolio of contracted energy infrastructure. It also owns and operates energy and technical services businesses (which trade under the name "Mondo").

As a provider of both transmission and distribution services, AusNet is actively involved in the connections application process and supportive of reforms that enable connections to keep pace with Australia's future energy needs, while protecting the power system. Within Victoria, we are an NSP responsible for managing connections to our distribution network. We also work closely with many developers that are going through the transmission connections process in Victoria, which is managed by AEMO under Victoria's declared network arrangements.

In many cases, NSPs and AEMO work collaboratively with developers to complete both the R0, R1 and R2 process without delay while balancing risks borne by all parties. However, we accept there are cases where developers experience additional costs, delays and uncertainty in the R1 process. AusNet considers the drivers of these costs, uncertainty and delay are more complex and varied than suggested in the CEC's proposed rule change. They include the volume and complexity of connection applications; availability of specialised connections engineering capabilities; execution of obligations as part of the R0 and R1 process; and modelling loop issues that pose real risks to developers and are not possible for them to mitigate.

The CEC's proposed rule change fundamentally re-evaluates the benefits, costs and risks borne by various parties under the connections process. Having carefully reviewed the three elements of the proposed rule, AusNet is concerned it is not a workable solution and may contribute to further delays and uncertainty in the R1 process. In particular:

- **Requesting developers to conduct a self-assessment without access to the necessary information and models presents challenges and would duplicate the R1 assessment process, thereby further increasing demand for specialist connection engineers.** Adequately assessing R1 compliance requires access to modelling packages such as PSCAD which contain sensitive compiled source code and data typically not provided to individual developers and their competing OEMs.
- **Defining a set of materiality thresholds to categorise applications within a type category will add complexity and ultimately time to R1 assessment process.** Establishing materiality thresholds for each type category in a guideline would require industry to standardise the R1 assessment process within a matrix of technical and non-

technical factors. AEMO's recent review of technical requirements highlights the complexity in reaching a consensus on the materiality of a generator's performance parameters on the power system. Given this complexity, AusNet is concerned this is likely to involve a long, iterative process that may ultimately end up being discarded due to the nuances that each project brings, rendering a single standard unsuitable.

- **The proposed type categories shift risk and responsibilities in the R1 process from the developer to NSPs and customers, without providing them the capacity to manage this effectively.** A key feature of the proposed rule change is that it would place the onus on NSPs to demonstrate why a developers' self-assessed type classification should not be approved. AusNet is concerned that this proposal will impact NSPs ability to uphold its system security obligations under Chapter 4 and 5 of the NER and will not deliver efficient outcomes for consumers.

While AusNet does not support the CEC's proposal (or similar variations), there are further opportunities for the industry to work together on improvements. AusNet suggests the AEMC explore a much wider set of regulatory and non-regulatory solutions that collectively address the drivers of uncertainty and delays in the R1 process. This includes:

- **Exploring batching or sequencing based reforms that consider whether the open-access nature of the NEM is fit for purpose during the transition.** Such reforms could enable developers that receive an offer to connect to make financial decisions about their project and associated grid risks with greater certainty. More broadly, they enable the industry to explore whether the open-access nature of the NEM is still fit for purpose as we attempt to rapidly decarbonise and transition the sector.
- **Considering additional regulatory options that enable NSPs to make 'anticipatory network investment' to facilitate an 'efficient level' of IBR.** There may be levers policy makers can pull to increase the headroom available to connection new IBR. For example, there could be amendments made to the existing network planning framework (e.g., TAPRs, RIT framework) to allow NSPs to make anticipatory investment up to an efficient level.
- **Explore integration with REZ access reform, including expansion of jurisdictional REZs**. While not discussed in the proposed rule change, it is likely that any changes to the R1 process will only apply to developer connection applications outside of REZs. We encourage the AEMC to explore how any future regulatory solution would integrate with these jurisdictional REZ regimes seeking to coordinate transmission and generation infrastructure within REZs.
- **Fast tracking OEM Whitelisting.** AusNet understands that the Connections Reform Initiative (CRI) OEM Data and Modelling reform is currently considering opportunities to improve the quality of data and models by whitelisting OEM providers. AusNet sees merit in this idea.
- **Closer engagement with education institutions.** AusNet encourages policy makers to consider opportunities for closer engagement with education institutions to ensure the right engineering skill sets are being developed for both early career engineers and existing engineers looking to reskill and enter the connections space.

These points are addressed in further detail in the attached submission. If you have any questions, please contact Jason Jina, Energy Policy Lead by email at jason.jina@ausnetservices.com.au.

We note AusNet is a member of Energy Networks Australia (ENA) and supports that submission.

Sincerely,

Suresh Damani
Manager, Network Connections
AusNet

AusNet

AusNet submission in response to the R1 Consultation Paper

Australian Energy Market Commission (AEMC)

Thursday, 28 September 2023

1. Introduction

AusNet Services Limited (AusNet) is pleased to provide our response to the AEMC's Enhancing investment certainty in the R1 process Consultation Paper (the R1 Consultation Paper).

Our submission is the product of detailed engagement with AusNet's connection engineers who are directly involved in the connections process on a daily basis. In summary, our submission:

- Provides our perspective on the drivers of uncertainty and delays in the R1 process (Section 2)
- Encourages the AEMC to apply a pragmatic set of assessment criteria when considering the benefits, risks and costs of reform to the R1 process (Section 3)
- Explores some of the practical challenges with the proposed rule as drafted, and why it is unlikely to mitigate or resolve the drivers of uncertainty and delays identified earlier (Section 4)
- Encourages the AEMC to explore a wider set of regulatory solutions, building on existing reforms in play (Section 5).

We trust the AEMC finds these reflections useful and would be happy to discuss any aspect of our submission.

2. Drivers of R1 uncertainty and delays

The drivers of uncertainty and delay in the R1 process are complex and warrant further consideration.

The R1 process tests whether the final plant design, models and performance parameters align with that agreed at the application phase (R0). For developers the R1 package approval satisfies a requirement before they can register their generation unit as a market participant and proceed to R2 commissioning exercises. Importantly, R1 occurs after a developer has received a 5.3.4.A letter, reached final investment decision and agreed a binding connection contract with the NSP (i.e. achieved committed status via a 5.3.7(g) letter). As a result, any delays or costs that occur during the R1 process directly impact a developers' ability to start earning revenue and meet financial commitments made to its investors.

For AEMO and NSPs, the R1 process is fundamental to upholding obligations to satisfactorily manage power system security and stability risks that may occur from the connection of new generation. This recognises that the connection of new inverter-based resources (IBR) can affect the performance of the power system and other existing or proposed IBR facilities nearby under a range of operating conditions. It can also impact the supportive operational conditions required for NSPs to undertake critical maintenance activities that maintain network reliability, security and safety.

In many cases, NSPs and AEMO work collaboratively with developers to complete both the R0, R1 and R2 process without delay while balancing risks borne by all parties. However, we accept there are cases where developer experience additional costs, delays and uncertainty in the R1 process. AusNet considers the drivers of these costs, uncertainty and delay are complex and varied, which makes identifying the specific causes relevant to each connection application difficult to delineate. At the highest level there are four key drivers, each of which are explored below.

Volume and complexity of connection applications

The Consultation Paper rightly identifies the volume of generation seeking connection and uncertainty surrounding the power system assessment of new IBR technologies as key factors driving delays to the timely connection and registration of new generation.

There are other related factors further increasing the complexity of assessing IBR connection applications to ensure no adverse power system security and stability risks to the network. This includes the amount of IBR seeking to connect in weak 'stringy' parts of the transmission and distribution network, and limited existing network capacity to host new IBR at both distribution and transmission level. In Victoria, existing transmission infrastructure is best described as at capacity. Existing grid constraints have meant there is minimal headroom available to connect new IBR without raising power system stability risks, and in many cases this is limiting investment in new solar and wind projects without developers incurring significant augmentation cost.

The availability of specialised connections engineering capabilities

The Consultation Paper also identifies the GPS negotiation and R1 stages as highly intensive engineering processes that require adequate resourcing, and that issues with the connections process can in part be attributed to the worldwide shortage of specialised connections engineering capability.

AusNet strongly supports this observation. The effort required by power systems engineers to assess R1 compliance for the average connection application is around 500-600 hours, with complex cases taking many more hours to complete.[1] Due to the volume and unique nature of each project, each of our senior distribution connections engineers typically have several R1 assessments active at the same time, often while providing technical advice on other R1 assessments to support their colleagues.

Across AEMO, NSPs and consultants there are a significant number of vacancies for specialist connections engineers. Senior capability is in particularly short supply, with businesses unable to keep up with demand. Due to a worldwide shortage, these skills cannot be obtained easily via skilled migration.

While AusNet is not aware of any official data on the shortage of connections engineers, one recent report suggested a shortage of 200,000 engineers across the entire professional engineering workforce by 2040.[2]

Execution of obligations under the current R0 and R1 process

The rule change request suggests that a lack of prescription in NER obligations on AEMO and NSPs is responsible for the delays in the R1 process, as this causes uncertainty around how decision making and timeframes are being treated in the R1 studies. In AusNet's experience the drivers of delay are the result of the execution of a much broader range of existing obligations from all stakeholders at both the R0 and R1 stage. We stress that this is not an exhaustive list, and each connection application has its own unique challenges. At a high level, these challenges include:

- **Outstanding issues from the connection application phase**

  A timely and efficient R1 assessment relies on the processes and procedures in the previously completed phases being run smoothly and associated risks being adequately managed. In reality, there are often practical reasons why this does not occur. In the application phase, they include:

  - *The quality of the original connection application and response to subsequent information requests.* For example, information and technical data about the connection applicants' connection requirements, and design and operation of its facility may be incomplete or inadequate. This can make it difficult for the NSP to conclusively determine all technical requirements for the equipment to be connected or its impact on the broader network. While these information gaps are generally resolved during the connection application phase, sometimes there is an agreement between the developer and NSP to consider them further once information is available as part of the R1 package. It's worth noting that, based on AusNet's experience, these issues tend to be more prevalent in connection applications where there is a transfer of project ownership after receiving an offer to connect. This is primarily because such parties may have a comparatively lower level of commitment to the connection application compared to those who have the intention to construct, own, and operate the facility themselves.
  - *All parties involved agreeing to conditions within the offer to connect that enable the connection application to progress to R1.* There are circumstances where the NSP or AEMO assess the technical performance of the required connection and cannot reach an agreement with the developer across all elements of the proposed connection. While not first preference, the NSP may agree to a negotiated access standard subject to specific conditions within its offer to connect. This 'good faith' gesture enables technical issues to be resolved once the final plant design, models and performance parameters are available as part of the R1 package. It also allows the developer to reach financial close, committed status and keep to its original commissioning date.

- **Consistency of the R1 modelling package compared to that agreed in the connection application phase**

  A timely and consistent R1 assessment also relies on the R1 modelling package progressing a connection application that is consistent with its signed connection agreement 5.3.7(g) letter. The R1 assessment typically occurs after the proposed facility has completed its detailed design and procured major equipment. During this period, the developer may seek to make material alterations to equipment, models and settings that may impact its ability to meet the performance standards agreed in the application phase. For example, the developer may choose to proceed with a different OEM provider depending on final availability, costs or risk profile of equipment. In these cases, the 5.3.9 process is triggered.

- **Quality and consistency of the R1 assessment**

  The rule change proposal suggests the R1 assessment process is too inflexible and does not allow AEMO and NSPs to accommodate minor reductions in the level of performance standard capability without reopening all aspects agreed in the connections application phase. It also suggests the 5.3.9 process prevents AEMO and the NSPs from reducing performance standards to levels less onerous than previously agreed, even when they still exceed the minimum access standard and are appropriate from a system security and operability perspective.

[1] AEMO, *Connections Scorecard*, July 2023
[2] The Insight Centre, *Engineering a better future: Australia's Growing Crisis of Engineering Skills*, March 2023

AusNet accepts that developers would prefer to have the ability to accommodate minor reductions in the levels of performance and re-negotiate down to minimum access standards for applications under the 5.3.9 process. However, we do not agree that there are circumstances where a downwards revision of the performance standard from that agreed in the connection phase is appropriate. This recognises that a connection application which has reached R1 is already treated as a committed generator or load, and its design and performance expectations are being used as an input to other nearby developers going through the connections application process. As a result, there are situations where lowering performance standards at a late stage in the process may not impact system security but would impact the performance of nearby generators undergoing connection studies, potentially triggering further studies for other parties and exacerbating the situation this rule change application is considering. This is the primary rationale for why the rules and current practice encourage developers to maintain if not exceed their existing performance levels agreed in the connections application phase.

We note that there may be instances where the performance originally negotiated during the connection's application phase may have been conservative or assessed differently by individual NSPs. We would be happy to discuss what could be done to alleviate specific concerns around the quality and consistency of R0 or R1 assessment beyond the reforms underway (e.g. AEMO's review of technical requirements for connection).

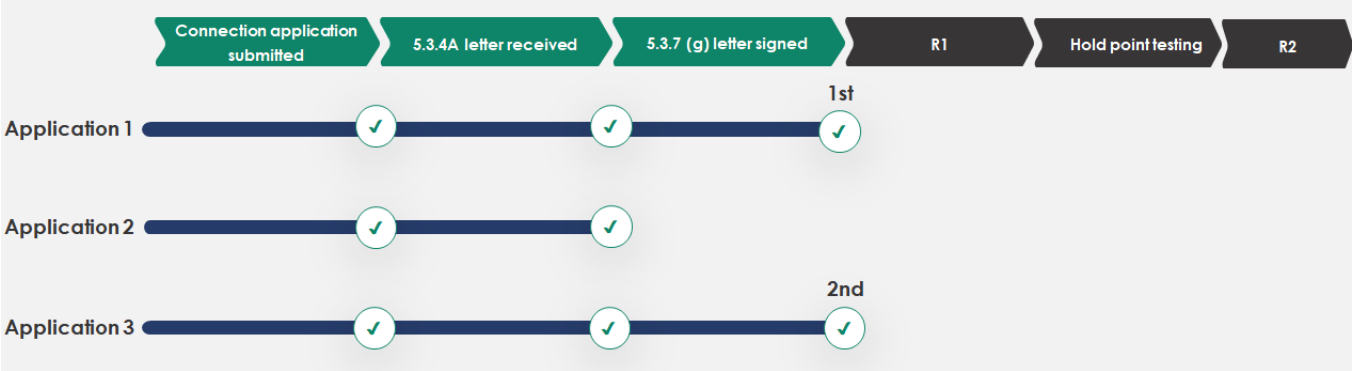
Competition to reach committed status from nearby generation or load facilities also seeking connection

The rule change proposal raises concerns that developers are being held responsible for unforeseen external changes to the power system that are outside of their control and impact their ability to demonstrate compliance with agreed standards prior to the finalisation of its R1 assessment.

AusNet concurs with the observation that the ongoing energy transformation is introducing added complexity into the connection process for developers. This complexity is notably more pronounced than in previous decades when external network condition changes were relatively less frequent and less challenging to navigate. Having said this, our observation is that during the connections application phase many risks are often manageable with access to timely and relevant information,. For example, developers have access to market information and analysis tools that can help them anticipate the timing and likely impact of retiring generation, commitment of new nearby IBR and introduction of new network elements. We note there may be opportunities to further improve developers access to timely information.

Following the connections application phase a generation or load unit is treated as committed and therefore will not be subject to external changes unless a significant amount of time lapses before an R1 modelling package is submitted (i.e. 12-36 months). There is, however, one major risk for new developers that is entirely unmitigated. That is, when another nearby facility achieves committed status via a 5.3.7(g) letter in the period where a developer has received an offer to connect via a 5.3.4A letter but not yet made investment decisions required to reach committed status itself. This situation is outlined in the figure below. In this example the developer submitting Application 2 has received its offer to connect but will subsequently be notified that Application 3 submitted by another developer has reached committed status. As a result, the developer of Application 2 will be required to repeat its connection application again considering the impact of both Application 1 and 3.

Figure 1: Example of the "modelling loop" sequencing issues faced by developers



This unfortunate 'modelling loop' sequencing issue stems from the intentional economic design of the NEM, which relies of an 'open access principles' to encourage IBR to reach committed status as quickly as possible by leaving them exposed in the interim. Since an NSP cannot reveal commercially in confidence information, the only way for a developer to mitigate this risk is by signing a binding 5.3.7(g) letter as soon as possible. AusNet understands this is a key frustration for developers and recognises the need to resolve this driver of uncertainty and delay.

We encourage the AEMC to consider the above drivers further ahead of the draft determination so that the industry can collectively direct effort towards addressing the right problems. This could include targeted engagement with industry stakeholders involved in the transmission and distribution connections process.

3. Suggested assessment criteria

We encourage the AEMC to apply a pragmatic set of assessment criteria when considering the benefits, risks and costs of reforming the R1 process.

AusNet's view is that the assessment criteria should reflect a pragmatic set of costs, benefits and risks of the rule change request, but also alternative regulatory solutions that may emerge through the rule change process.

With this in mind, we have identified several additional criteria that could be added or incorporated within the assessment criteria proposed in the Consultation Paper, which we support. Specifically, we would encourage the AEMC to consider whether its preferred regulatory solution:

- **Promotes greater certainty around timeframes and outcomes across the entire connections process** – Our understanding is that developers are primarily seeking a connections process that allows them to meet their proposed commissioning date and avoids uncertainty from material renegotiation of technical performance or additional costs incurred during the R1 process.

  While we can all agree to this in principle, it is important that any solution does not inadvertently shift these problems to another phase of the connections process or another party. For example, shortening timeframes and reducing uncertainty in the R1 process may extend timeframes and uncertainty in the commissioning phase.

- **Allocates risk and responsibilities to the party with the inherent capability and incentives to do so effectively** – The proposed 'implementation considerations' criterion considers whether a solution creates incentives that promote pragmatic engineering solutions to assess and manage power system risks. AusNet supports this criterion and suggests this is broadened to consider whether a solution allocates responsibilities to the party with the inherent capability and incentives to perform their allocated role. This is particularly important when considering solutions that propose a fundamental shift in roles, such as the proposed rule change request.

- **Promotes decisions which are transparent, collaborative and consistent** – The proposed 'principles of good regulatory practice' criterion identifies the need to consider whether changes to the R1 process promote transparency and predictability, while the 'innovation and flexibility' criterion suggests the need to resolve system needs iteratively through collaboration. We strongly support these criteria, however we note that it is highly ambitious to expect regulatory changes would improve the predictability of connection outcomes given the multitude of factors at play, including the fundamental principle of the NEM to encourage competition through the open access regime. Instead, we would suggest working towards a consistent assessment of connections is more feasible.

- **Avoids complexity and encourages flexibility to make engineering judgements** – AusNet supports the proposed criteria identifying the need to consider issues related to the simplicity of R1 process. Simplicity is critical to driving timely outcomes. The more complex a solution, the more effort (and potentially over-analysis) required by those involved**.**

  We also strongly agree that any workable solution will require AEMO and NSPs to have the flexibility to make engineering judgements. In our experience, each connections application has its own unique benefits and challenges. The fact highly specialised engineers are required to complete these assessments suggests the need for judgement, rather than prescriptive requirements.

- **Integrates with other NEM and jurisdictional connections reforms** – The connections process is currently in a period of significant policy reform with processes underway that consider amendments to technical standards and processes, access arrangements within and outside of REZs and regulatory treatment of different services. It is quite possible that many of the existing reforms planned or underway could help address drivers of uncertainty and delay in the R1, and integrate with any solutions conceived in this rule change. Note, we explore this further in Section 5.

4. Our perspective on the proposed rule

AusNet is concerned the proposed rule is not practically feasible, may contribute to further delays and uncertainty in the R1 process and increase risk to the power system.

The CEC's proposed rule proposes significant amendments to the existing R1 process, codifying new regulatory obligations on all parties involved. Having reviewed the three elements of the proposed rule, AusNet is concerned it is not a workable solution. This section outlines the practical challenges with the proposed rule as drafted and summarises our views on why it may contribute to further delays and uncertainty in the R1 process.

Requesting developers to conduct a self-assessment without access to the necessary information and models presents challenges and would duplicate the R1 assessment process, thereby increasing demand for specialist connection engineers.

The rule change request proposes that developers prepare and submit a self-assessment that includes a suite of R1 modelling and design information comparing their plant's performance against that agreed in the connections application phase.

AusNet sees challenges in how this self-assessment would be practically undertaken by a developer. Adequately assessing R1 compliance requires a deep understanding of the local and regional power system. If we assume the developer could acquire these services externally through independent consultants, they are unlikely to have access to the required modelling packages such as PSCAD. This is because PSCAD contains accurate and sensitive compiled source code, and code and data of developers' competitors. For this reason, some developers and OEMs have traditionally been opposed to sharing PSCAD models.

We are also concerned the process will duplicate the assessment process, rather than resolve issues around the quality and consistency of the R1 assessment. This is because to have confidence in a developer's R1 self-assessment, AEMO and NSPs would have to conduct their own R1 modelling exercise and compare their results with the self-assessment rather than "review" the self-assessment. As a result, we would expect the self-assessment would increase demand for specialist connection engineers, exacerbating existing delays and bottlenecks caused by skills shortages.

We understand the proposed rule seeks to leverage early discussions and collaboration in advance of the formal submission of a R1 self-assessment to provide confidence in the self-assessment. While we support this aspect of the proposed rule, NSPs inherent responsibility is to manage their power system security obligations. They, therefore, have a different set of incentives and capacity to evaluate R1 performance compared to developers. In this context, we do not see early consultation with a developer ahead of its self-assessment and the subsequent review as a substitute for conducting our own R1 modelling exercise.

Defining a set of materiality thresholds to categorise applications within a type category will add complexity and ultimately add time to R1 assessment process.

The proposed rule change introduces a new process to govern the range of decisions that AEMO and NSPs can make in response to a developer's R1 self-assessment. Central to this process is the introduction of five new type categories to be defined in a guideline subject to industry consultation.

AusNet is concerned that this 'type-category' framework will be difficult to define and add complexity to the R1 assessment process. Defining materiality thresholds for each type category in a guideline would require industry to standardise the R1 assessment process within a matrix of technical and non-technical factors. AEMO's recent review of technical requirements highlights the complexity of reaching a consensus on the materiality of a generator's performance parameters on the power system. As noted on multiple occasions in this submission, each connection application has its own unique benefits and challenges. A materiality threshold oversimplifies the complexity of this assessment, which ultimately requires the judgement of AEMO and NSP connections engineers in collaboration with the developer.

Given this complexity, AusNet is also concerned negotiating the relevant category for each individual connection application will lead to a long, iterative process that that may ultimately end up being discarded due to the nuances that each project brings rendering a single standard unsuitable. We are also concerned this process draws on the specialist resources of NSPs, AEMO and developers to focus on a conceptual definition rather than the specific performance issues at hand.

The proposed type categories shift risk and responsibilities in the R1 process from the developer to NSPs and customers, without providing them the capacity to manage this effectively.

A key feature of the proposed rule change is that it would place onus on NSPs to demonstrate why a developers' self-assessed type classification should not be approved. It also increases the level of evidence that an NSP will have to provide to demonstrate how connection would lead to a substantive negative impact on system security, power quality and operability. AusNet is concerned this proposal will impact NSPs ability to uphold its system security obligations under Chapter 4 and 5 of the NER and will not deliver efficient outcomes for consumers.[3] The risks under each type category are explored below.

Risks borne from Type 4 and 3 connections

Under the proposed rule change, the onus is on NSPs to demonstrate why a connection application should fall under a Type 4 Action Plan (i.e. major issues). In some situations NSPs may be forced to approve an R1 packages for connection applications under a Type 2 or 3 Action Plan that they may otherwise deem a power system risk. This is because the level of evidence required to justify why a connection application falls under a Type 4 action plan is extremely high and likely to be unachievable in the mandated timeframes.

For example, for any given connection application there could be a range of factors at play that may make it difficult to demonstrate why a Type 4 Action Plan is appropriate within the required timeframes. As discussed in Section 2, this includes issues with the volume and complexity of connections applications, skills shortages or the consistency of the developer's R1 modelling package. All are outside the NSP's control.

The proposed rule change also encourages NSPs to grant 'conditional registration' for both Type 3 and 4 connections, so these connection applications can quickly complete the R1 assessment process. AusNet is concerned that any conditional obligations placed on a connection application would be hard to enforce and would lead to the commissioning of generation units that may impact the performance of the power system or nearby IBR facilities. This recognises that the only remaining gate is the R2 hold point process, and it can often be difficult for NSPs to raise material issues at this late stage – even if included in an "action plan." It also recognises that compliance is currently 'self-declaring' and NSPs do not have powers to enforce significant R2 or post commissioning compliance activities. We suggest the AEMC reviews previous connection applications where conditional approval has been provided as it considers the merits of this proposal. In our experience, conditional approval has resulted in poor outcomes (e.g. non-functional R2 models).

The Consultation Paper notes that some stakeholders consider power system stability issues are only able to be properly understood when a generator becomes fully operational. We do not accept this view. AEMO has responsibility to ensure that all plant and equipment under its control and coordination is operated within the appropriate operational and emergency limits as advised by the NSP or registered participant.[4] If plant design and performance is finalised after the R1 process, AEMO and NSPs may not have access to the right data to uphold this responsibility. Full visibility of a plant's performance will only be possible once an incident occurs on the network.

In this context, the proposed rule change may lead to many cases where AEMO is required to intervene and constrain dispatch of that individual generator and possibly nearby generators on system security grounds. Over the long term, we would suggest the benefits of connecting generation or load quickly (i.e. lowering energy charges by avoiding connection delays) are likely to be outweighed by the poor output of these facilities and the additional security risks borne by the system. If the system is less secure, this may also materially impact the capacity of NSPs to connect future connections and undertake critical planned outages.

Risks borne from Type 2 connections

If a connection application falls under a Type 2 Action Plan (i.e. material issue due to change in the external network environment), the rule change proposes the NSP is responsible for remediating the issue. As discussed in Section 2, AusNet is not aware of any circumstances where developers would be subject to unforeseen external change following receipt of its 5.3.7(g) letter unless there is a delay in submitting its R1 package. This is because by this stage the generation or load unit is treated as committed.

Putting this issue aside, AusNet does not consider it appropriate to ask NSPs to be responsible for the Type 2 Action Plan because:

[3] For example NER Clause 4.3.1(w), which requires AEMO to ensure each System Operator satisfactorily interacts with AEMO, other System Operators and Distribution System Operators for both transmission and distribution network activities and operations, so that power system security is not jeopardised by operations on the connected transmission networks and distribution networks.
[4] See NER Clause 4.3.1(h).

- **The obligations ultimately shift risk from developers to customers.** As a regulated activity, NSP remediation would incentivise developers to justify the connection under a Type 2 Action Plan as often as possible, as this transfer costs currently paid for by developers onto consumers via higher TUOS charges.
- **The proposal is likely to increase the complexity of R1 assessment and extends the end-to-end connections process.** The questions to be considered in the Type 2 Guideline are complex and when finalised will require application on a case-by-case basis. While we understand the intent of the proposed rule is not to require detailed or time-consuming analysis and processes, we are unclear on what mitigations can be put in place to avoid this.
- **If there is a material issue with the connection application, developers are best placed and incentivised to resolve the issue as quickly as possible.** In many cases re-tuning exercises are the most efficient tool to resolve generator performance issues. Asking NSPs to devise a centralised solution because re-tuning imposes additional costs on developers may not be efficient, particularly if NSPs do not want to perform this role.

These risks highlight why the most efficient and sensible outcome is to provide the NSP time to review the R1 modelling package and ask the developer to demonstrate R1 compliance before proceeding to registration and R2 commissioning exercise.

5. Solutions for further consideration

AusNet encourages the AEMC to explore a wider set of regulatory solutions, building on existing reforms in play.

While AusNet does not support the CEC's proposal (or similar variations), we appreciate that there are further opportunities for the industry to work together on improvements that facilitate the volume of renewable generation and load connections required for the energy transition, while protecting the power system.

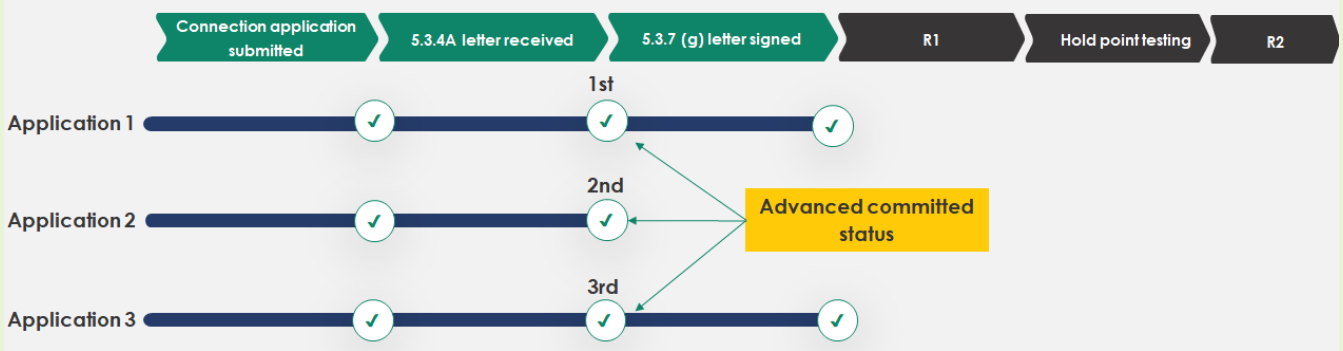
AusNet suggests the AEMC explore a much wider set of regulatory and non-regulatory solutions that collectively address the drivers of uncertainty and delays in the R1 process outlined in Section 2 and assessment criteria in Section 3. Some reforms that we consider warrant further consideration are outlined below. We note that while none of these solutions are fully formed, many build on existing reforms or processes.

1. Explore batching or sequencing based reforms that consider whether the open-access nature of the NEM is fit for purpose during the transition

In Section 2, we outlined modelling loop sequencing issues that developers are unable to mitigate, which are responsible for many external change-related delays in the connections process. AusNet suggests the AEMC explore batching or sequencing based reforms. Such reforms could enable developers that receive an offer to connect to make financial decisions about their project and associated grid risks with greater certainty. More broadly, they enable the industry to explore whether the open-access nature of the NEM is still fit for purpose as we attempt to rapidly decarbonise and transition the sector.

One potential solution could involve introducing the concept of an "advanced committed" project. That is, to treat any application that has received its 5.3.4A letter as a committed project for a time-bound period. This approach would provide developers with much greater confidence that performance requirements agreed and relied upon to reach final investment decision will not require revision if another nearby facility achieves "committed" status before they do. Reusing our previous example, under this approach Application 2 would be treated as an advanced committed before Application 3 as it received its 5.3.4A letter first. As a result, Application 3 would have to consider the impact of Application 1 and 2.

Figure 2: One potential solution to the "modelling loop" sequencing issues faced by developers



Similar to other queuing solutions, there are a range of considerations that would have to be worked through. For example, how to manage a high volume of smaller connections which can result in a lengthy queue, or what incentives are appropriate to avoid any 'hoarding' or 'delaying' behaviour. Having said this, we consider this type of solution could significantly reduce the unforeseen risks for developers under the 'open access' design of the NEM.

2. Consider additional regulatory options that enable NSPs to make 'anticipatory network investment' to facilitate an 'efficient level' of IBR

In Section 2, we highlighted that limited existing network capacity to host new IBR at both distribution and transmission level was increasing the complexity of assessing IBR connection applications. Instead of waiting for these issues to emerge, there may be levers policy makers can pull to increase the headroom available to connect new IBR. For example, there could be amendments made to the existing network planning framework (e.g. TAPRs, RIT framework) to allow NSPs to make anticipatory investment up to an efficient level.

AusNet considers this type of network driven approach would better align with the recently introduced system strength framework than the rule change proposal's Type 2 mechanism. This is because it would involve proactively planning for a region/network wide growth in future connections rather than reactively responding to individual connections applications. It also amends existing planning tools rather than introducing a new process.

3. Explore integration with REZ access reform, including expansion of jurisdictional REZs

While not discussed in the proposed rule change, it is likely that any changes to the R1 process will apply to developer connection applications outside of REZs. This recognises that jurisdictional governments have either developed or are actively considering jurisdictional access regimes to coordinate transmission and generation infrastructure within each region's REZs.

All indications suggest that these bespoke arrangements will provide benefits that drive a significant volume of IBR connections within REZs and discourage connections outside of REZs. We would encourage the AEMC to explore how any future regulatory solution would integrate with these jurisdictional REZ access regimes, including whether these arrangements could be expanded to a region wide level.

4. Fast track OEM Whitelisting

AusNet understands that the Connections Reform Initiative (CRI) OEM Data and Modelling reform is currently considering opportunities to improve the quality of data and models by whitelisting OEM providers. AusNet sees merit in this idea, on the assumption that the group of OEM providers that are whitelisted is not too small. The more familiar an NSP is with a particular model and OEM provider, the more quickly an application is likely to be approved.

5. Closer engagement with education institutions

The shortfalls in required engineering resources for the coming decades is a major hurdle to the transformation of the grid. AusNet encourages policy makers to consider opportunities for closer engagement and collaboration with education institutions. It is critical that the right skill sets are being developed for the next generation of engineers to come through universities, but also for the development of courses for existing engineers to retrain in the connections space and improve their understanding of the process.

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