

10 August 2017

Mr John Pierce
Chairman
Australian Energy Market Commission
PO Box A2449
Sydney NSW 1235

Lodged online via: www.aemc.gov.au

Dear John,

National Electricity Rules Amendments: Managing the rate of change of power system frequency (ERC 0214) and Managing power system fault levels (ERC 0211)

TransGrid fully supports efforts to maintain power system security and welcomes the opportunity to respond to the AEMC's two system security draft rule determinations. This submission responds to both of these rule changes.

Context

The National Electricity Market (NEM) is in a period of fast change as intermittent non-synchronous generation replaces synchronous generation in high volumes. Power system security still needs to be efficiently maintained, even as the understanding of the impacts is still emerging. To support reliability, it is also important that new generators can connect in a timely way and without bearing unreasonable costs. Meanwhile, the capabilities of various power system technologies are improving quickly and their costs continue to fall rapidly.

Summary of TransGrid's response

TransGrid agrees that TNSPs are well placed to have a central role in managing system security in a more complex power system. Specific concerns about the draft rules are summarised below and addressed in more detail in Attachment A.

Draft rules do not promote efficient outcomes – as timetable incompatible with RIT-T

The timetable for specifying and amending inertia service requirements provides no certainty and is incompatible with the current Regulatory Investment Test for Transmission (RIT-T)¹.

Using the current RIT-T, the timeline precludes assessment of feasible and potentially efficient investment options so contract tender processes are subject to less competitive pressure. The risk is amplified as the contracting and procurement protections AEMO has for NSCAS are not included in either of these rules. Further, the costs could be higher than necessary if there is uncertainty about the duration of a service need.

¹ TransGrid notes that while this is an issue for the frequency control rule, the RIT-T is generally not fit-for-purpose in this fast changing environment.

TransGrid recommends that the AEMC considers a truncated options analysis process which requires transparent economic analysis of all options but is much quicker than a RIT-T.

Short Circuit Ratio (SCR) risks over-investment and does not guarantee System Strength

SCR is a limited indicator of 'system strength' which can be used to screen for the need for detailed analysis. However, there are situations where instability exists but the SCR does not indicate a problem. A more representative 'system strength' metric would incorporate a range of service indicators, describing how the network and connected plant responds dynamically to contingencies. Such a metric would not need to be specified at every connection point.

The 'system strength' metric should properly relate to system stability and account for dynamic conditions. The service requirement does not need to be defined at every connection point.

System strength requirements - practical implications and interactions with Open Access regime

Care is required to ensure that system strength requirements and their application:

- > Allow system strength shortfalls to be addressed efficiently, particularly as current connection processes do not facilitate coordination and cost sharing well.
- > Do not unnecessarily delay or discourage generation connections with significant technical or commercial barriers. In particular, the extent of 'do no harm' provisions need to be balanced with the Open Access nature of the market.

TransGrid recommends that AEMC considers how the revised system strength metric is applied in practice. This could be addressed at further stakeholder workshops.

Specification of roles and obligations can be tightened

These rules give TNSPs important new system security obligations but these obligations are not always clearly defined and contain some inconsistencies. For example, the lack of liability protections for TNSPs in relation to the new functions is inconsistent with existing National Electricity Law (NEL) provisions.

TransGrid recommends that the AEMC allows the new obligations to be covered by the liability provisions in the NEL and that it clarifies the intended extent of the new obligations.

Cost recovery

The draft rules are biased towards contracting for services. Contracting approaches bring compliance and commercial risk for TNSPs but little incentive. Compliance risks cannot be contracted out. When a new service requirement is identified or an existing one is used much more than forecast, cost recovery is delayed for up to two years.

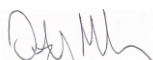
Consultation process is too short for such important issues

The short consultation period has been inadequate for such important system security issues.

As there are outstanding issues, the AEMC is asked to consider a further round of stakeholder consultations and/or conduct workshops with all interested stakeholders. It would be useful if workshops can include case studies of how arrangements will be applied in practice.

TransGrid appreciates the opportunity to comment on this rule change and is keen to engage further with the AEMC. If you would like to discuss this submission, please contact Stuart McGrow on 02 9284 3615 in the first instance. We look forward to engaging further with the AEMC and other stakeholders on this Rule change.

Yours faithfully



Anthony Meehan

Executive Manager, Regulation

Attachment A – Detailed responses

About TransGrid

TransGrid is the operator and manager of the high voltage transmission network connecting electricity generators, distributors and major end users in New South Wales and the Australian Capital Territory. TransGrid's network is also interconnected to Queensland and Victoria, and is central to interstate energy trading.

Context

In the coming years, the type and location of generation in the National Electricity Market (NEM) will change significantly. The intent of these draft rules is to efficiently maintain power system security as synchronous generation is progressively retired and replaced by intermittent non-synchronous generation. While some of the resulting system security issues are well understood, other emerging impacts are less so.

To support reliability, it is also important that new generators can connect in a timely way and without bearing unreasonable costs. Meanwhile, the capabilities of various power system technologies are improving quickly and their costs continue to fall rapidly.

As envisaged by these rule changes, TNSPs are well placed to have a central role in managing a more complex power system, with more distributed energy sources with different characteristics. Technology developments may increasingly allow for multiple system services to be provided by new asset types such as energy storage. With local system expertise and an existing central role, TNSPs can ensure that security and other power system services are provided efficiently in a technology neutral way.

These new rules must address the known risks with proven technological capabilities. However, new technology capability is improving quickly and costs continue to fall rapidly and the understanding of system security risks and resulting service needs is still evolving. The rules put in place now should not constrain how system security is ensured in the future, nor should they be an impediment to efficiency in a very fast moving environment.

A more appropriate and flexible framework in the long term interest of consumers would allow TNSPs to:

- > Provided or procure system security services from any proven technology or approach
- > Quickly and transparently assess of options for the most efficient service provision
- > Co-optimize of the provision of multiple system security services where possible, regardless of the source.

TransGrid's response to these draft rules is mindful of these attributes.

Issues common to both rules

Further consultation on these rule changes is recommended

These draft rules have been subject to a very short consultation for such important system security issues. While there is a need to ensure system security over the coming summer periods, it is important these rule changes properly account for other ongoing reforms and avoid entrenching inefficient or ineffective processes.

As there are outstanding issues with these rules, TransGrid recommends that the AEMC considers a further round of stakeholder consultations and/or conduct workshops with all interested stakeholders.

This is in line with the views of Energy Networks Australia members.

The specification of roles and obligations

The draft rules impose on TNSPs and AEMO very important new system security obligations. However, there are inconsistencies in how these are set up within the draft rules and in relation to the rest of the regulatory framework.

The draft rules do not include provisions for appropriate liability protections for TNSPs in relation to these new functions. This is inconsistent with existing provisions in sections 119(2) & (3) of the National Electricity Law (NEL) and clause 13(2) of the NEL Regulations. The intent of these is to ensure that TNSPs are afforded the same reasonable level of statutory protection from liability in negligence, for performing key system security related obligations imposed by the Rules, that is afforded to AEMO under sections 119(1) & (3).

In line with the ENA's recommendation, TransGrid recommends the AEMC seeks from the SA Government an amendment to clause 13 of the NEL Regulations. This should extend the existing section 119 NEL(2) statutory limitation on liability for TNSPs undertaking system security related functions to cover new obligations placed on them under these draft rules.

TNSP obligations are defined in absolute terms but the information relied upon is based on AEMO's 'best endeavours' in specifying the service. TNSPs are required to procure the amount of service specified by AEMO and to ensure that this adequately account for provider outages.

For example, in draft rule Managing the Rate of Change of Power System Frequency (ERC0214), clause 5.20B.4(b)2:

'an Inertia Service Provider for an inertia sub-network must:...

make a range and level of inertia network services available such that it is reasonably likely that inertia network services that provide the required level of inertia when enabled are continuously available, taking into account planned outages and the risk of unplanned outages;'

It is unclear what the extent of this obligation is. It is not clear how far TNSPs should go to ensure the amount of inertia service set by AEMO's best endeavours analysis can be met in a range of outage scenarios.

TransGrid recommends that the AEMC clarifies the intended extent of the new obligations.

Limited incentives and cost recovery delays

The draft rules allow the TNSP to contract for system security services. The frequency control rule's process is particularly biased towards this. As discussed further below, the process does

not provide a realistic opportunity for investment options to be considered, even if these are efficient.

While TransGrid is committed to providing services efficiently but there is limited incentive for contracting, especially if materiality is high and/or there is an un-forecast step change in service requirements. Inertia requirements will be externally driven and the service need could be unpredictable and the costs may not be included in a revenue allowance.

Costs recovered via pass-through arrangements have a cash flow impact - a provider is paid for a service but the contract cost is recovered up to two years later. Contracting approaches also bring compliance risks which cannot be contracted out.

TransGrid recommends that AEMC considers a mechanism to allow faster cost recovery, particularly for the first time a service need is identified.

Procurement protections

While TNSPs will be procuring system security services much like AEMO procures NSCAS, AEMO's various contracting and procurement protections have not been extended to TNSPs.

These provisions are useful in ensuring that services are provided efficiently, especially if a generator within a 'sub-network' has market power. AEMO can assess whether the tender process is competitive (that is, the service requirement can be met if any one conforming tender is excluded). If not, there is a clear requirement to negotiate in good faith – to so far as practicable minimise the overall cost of the service and appropriately remunerate the providers. There is also a backstop provision of independent review which is available to either party (NER 3.11.5 (h) and (i)). These provisions would be useful, particularly where the process effectively precludes investment options.

Also, AEMO does not need to accept the lowest priced tender. It is assumed that this allows other service attributes to drive the procurement decision, if necessary. These draft rules require TNSPs to procure least cost option (for example in 5.20.B4(f)m) and it is unclear if TNSPs could choose between providers on another basis.

TransGrid recommends that AEMC provides TNSPs with similar provisions to those in the NER 3.11.5 h and i.

Issues specific to Managing the Rate of Change of Power System Frequency (ERC0214)

Timetable is incompatible with RIT-T and precludes efficient options

The timetable for specifying and amending inertia service needs provides no certainty and it is incompatible with the current Regulatory Investment Test for Transmission (RIT-T). I

Technology developments may increasingly allow for multiple system services to be provided by new asset types such as energy storage. With local system expertise and an existing central role, TNSPs can ensure that security and other power system services are provided efficiently in a technology neutral way. However, this process effectively makes the TNSP a procurement agent which does not recover its costs for up to two years.

From the point when AEMO identifies an inertia service need there is unlikely to be enough time to complete a RIT-T before the service must be available. Efficiency is compromised as:

- > Feasible investment options are effectively precluded
- > Generators tendering for service provision are under less competitive pressure

- > There is no opportunity for TNSPs to co-optimize multiple services with one investment.

This is mainly an issue for the frequency control rule. A more appropriate framework would be flexible as envisaged in the 'Context' section above.

TransGrid recommends that the AEMC considers a truncated options analysis process which requires transparent economic analysis of all options within around three months. This would allow all options to be considered equally.

RIT-T is not fit-for-purpose in a fast changing environment

As a general observation, TransGrid does not consider the current RIT-T to be fit-for-purpose in such a fast changing environment. Option costs or system requirements can change dramatically while a RIT-T is progressing. This can be illustrated using a hypothetical example - a RIT-T initiated in mid-2016 including a grid-connected storage option would have been quite inaccurate on completion in mid-2017, due to a reduction in storage costs of around 20% during the year.

Issues specific to Managing Power System Fault Levels (ERC 0211)

Technical specification of System Strength

The proposed Short Circuit Ratio (SCR) is a relatively simplistic approach to measuring 'system strength'. It is a worthwhile proxy, and a useful screening mechanism that should trigger more detailed analyses and modelling², as it is likely to be quite a dynamic measure over-time.

Defining the system strength service needs as a minimum SCR at every generator connection point risks over-investment in network and connection assets, without achieving system security. However, TransGrid notes that this is an area where the behaviour of the power system (and new types of generation) is still not fully understood. There are risks in locking in rules requirements at this point and a more flexible approach would be pragmatic. This could involve moving more detailed service specifications from the rules to the planned AEMO guideline.

A more comprehensive measure of system strength involves assessing how the network physically and functionally operates and responds, which in turn requires assessment of:

- > supply quality
- > protection systems' performance in clearing faults under different conditions, and fault ride through under credible contingencies
- > whether low 'system strength' outcomes could result in stability issues, including:
 - 'synchronous' and 'non-synchronous' plant stability
 - whether there will be the correct operation of protection systems, and
 - voltage control.

² The AEMC should be mindful that such additional analysis should not be stymied by a restrictive and inconsistent Final Determination on AEMO's Generating System Model Guideline rule change proposal.

AEMC should be mindful that such additional analysis will be facilitated greatly by AEMO's Generating System Model Guideline rule change proposal, which requires generators to provide detailed information.

TransGrid recommends that AEMC considers:

- > *Defining a set of system strength principles in the rules*
- > *Allowing the planned AEMO guideline to set out the aspects of system strength which need to be considered and provide guidance on how these should be analysed consistently*
- > *Allowing system strength to be defined and managed at key points in the network rather than at every generator connection point.*

System strength requirements - practical implications and interactions with Open Access regime

The NEM will require a high volume of new generator connections in the coming years and the trend will be for synchronous generation to progressively retire and be replaced by intermittent non-synchronous generation. To ensure reliability, it is important that new generators can connect in a timely way and without bearing unreasonable costs.

The NEM is an Open Access market and system strength shortfalls can be (and are) managed in the dispatch process. TransGrid understands that over time this process can become extremely complex making it difficult to assess whether the system is secure or not. Nevertheless, it is important that 'do no harm' principles in the system strength arrangements are balanced with the Open Access intent of the NEM. There may be situations where it is most efficient for transient system strength issues to be managed in despatch.

The system strength metric (if changed as discussed above) is a complex combination of attributes and there is also a need to consider the extent a new generator is liable to address a shortfall. The system strength arrangements need to work efficiently, effectively and fairly in practical situations, such as:

- > When a new generator requests a connection one day after a large synchronous generator retires.
- > When multiple generators want to connect within a locality but where the exact order of connection is not known.

In such situations, arrangements should facilitate the most efficient solution to the system strength shortfall. In some cases, a TNSP investment could solve the problem at a fraction of the cost of many generator site solutions. It should also allow the allocation of costs to a party if it clearly causes them.

This will require more consideration of how the system strength metric is defined and applied in practice and how connection processes could operate within the rules.

TransGrid recommends that AEMC considers how the revised system strength metric is applied in practice. It would be useful if the AEMC is able to host stakeholder workshops which include case studies of how arrangements will be applied in connection scenarios such as described above.