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Market Operator
Power and Water Corporation
GPO Box 1921
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Attention: Matthew Phillips

By email: market.operator@powerwater.com.au

Dear Market Operator

Submission in relation to *System Strength Impact Assessment Guidelines*

Territory Generation (TGen) appreciates the opportunity to provide a submission in relation to the draft System Strength Impact Assessment Guidelines, the Generator and Load Model Guidelines and the Model Change Management Requirements documents (the Consultant Paper).

TGen makes the following comments:

EMT modelling software

TGen understands that PSCAD is used in the National Electricity Market (NEM) for EMT modelling and that recently the Wholesale Electricity Market (WEM) is planning to move from PowerFactory to PSCAD for the purpose of EMT modelling. This would leave the Northern Territory the only jurisdiction in Australia to remain with PowerFactory for EMT modelling.

TGen has no preference for one software package over the other in the event that there is no material cost differential to have generator models developed and validated, and to undertake system studies utilising the system models.

It would be beneficial to system participants that PWC provides an assurance that there would be no cost impact on power system participants, to convert existing PowerFactory EMT models to PSCAD and that any potential costs for testing/validation of such converted models would be borne by PWC.

Please note that TGen is currently working on a number of projects that involve modelling of existing and new generators under the current requirements of the Network Technical Code. There is an opportunity for this modelling to be completed using either of the EMT modelling. TGen requests that a decision be made promptly prior to the model development commencing so that TGen is not faced with additional costs and time delays that would result from changing software mid-stream.

System Strength Impact Assessment Guidelines (SSIAG)

TGen believes that the foundations on which these draft SSIAG is based is unclear, primarily on what is considered the base level of system strength.

The SSIAG for new or altered connections is essentially a 'do no harm' principle.

In recent years the load pattern has changed significantly as behind the meter solar PV in the Alice Springs and Darwin/Katherine power systems has increased to the level that the minimum demand on synchronous thermal generation has moved from overnight to be in the middle of the day.

In recent months the Power System Controller has released a Risk Notice for the Darwin/Katherine power system that requires 'four large machines' online during low loads, even though three 'large' machines would meet the spinning reserve requirements. This requirement for four large machines has seen TGen plant operating at, or around, minimum stable loads during low load periods. In clarification sought by TGen the rationale for a fourth machine to be online has been outlined as reactive reserve limitations.

TGen has requested the studies undertaken in the power system model that support the four large machine requirement be shared to enable better understanding of the power system need that is being addressed. Although these studies have not been provided to date, it appears that system strength is already at a minimum at low system loading conditions and is resulting dispatch constraints. TGen is concerned how the power system scenarios in sections 2.2 and 5.5.1 of the SSIAG are to be determined.

TGen believes that it would be beneficial to system participants if a detailed clarification is provided on the following:

- How the Power System Controller and or Network Operator determine the base level system strength, and how will this be done in the future?
- What synchronous generation dispatch is being assumed?
- How is the maintenance of the base level of system strength, now and into the future be funded?
- How is the impact of the behind the meter solar PV on system strength being considered?

It is noted the current draft SSIAG is based on the AEMO equivalent document, however not all surrounding regulatory framework(s) that exist(s) in the NEM is in place in the NT. Accordingly, TGen suggests that if this guideline was to be implemented it should be accompanied by the activation of the equivalent regulations applicable in the NEM, for example clause 5.20.C of NTNER. If clause 5.20.C is 'unlocked' it would clarify roles and responsibilities and increase transparency.

Disconnection/decommission

The SSIAG focuses on new additions or alteration to the generation system. TGen believes that the decommissioning or permanently disconnecting a generator from the system is an alteration to the generation system that is not sufficiently covered. It is important to consider whether future disconnections and decommissioning of generators will likely have an impact on system strength.

Changes to dispatch requirements

The generation dispatch profile required to be dispatched from generators in the Power Systems has been changing over the last few years, particularly the lowering of dispatch requirements between 10:00 and 14:00. As these lower load periods continue to evolve the dispatch of the existing generation fleet may not be able to provide the required system strength within the limitations of the generators.

A regular review of the power system strength requirements under the locked clause 5.20.C of the NTNER would monitor the system strength requirements for changing load patterns.

Network changes which may affect power flows

Generators' ability to import/export real and reactive power are affected by the network configuration. If the network operator is performing additions/alterations, how is the impact on generator dispatch assessed? Is a System Strength Impact Assessment required to be undertaken? How will the results be shared with participants?

If you have any queries or require any clarification, please do not hesitate to contact Andrew Roberts on 0436649896 or by email: andrew.roberts@territorygeneration.com.au.

Yours sincerely



Hieu Nguyen
General Counsel and Company Secretary

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