Our Ref: D12/45370
Your Ref:

11 October 2012

Mr John Pierce
Chairman
Australian Energy Market Commission
Level 5, 201 Elizabeth Street
SYDNEY NSW 2000

Dear John

Transend optional firm access submission

Transend welcomes the opportunity to respond to the Australian Energy Market Commission's (AEMC) Transmission Frameworks Review. Transend contributed to the development of, and fully supports, the Grid Australia submission. The purpose of this submission is to highlight some key technical challenges in the context of the Tasmanian region, based on Transend's experience in considering generation and network developments.

Transend owns and operates the electricity transmission system in Tasmania. Transend transmits electricity from power stations in Tasmania and on mainland Australia (via Basslink) to its customers around the State. Transend currently has 16 transmission customers, including generators, networks and directly-connected major industrials. Many of these customers have a number of connection points to the transmission network.

The Tasmanian transmission system has particular characteristics that affect available capacity of the transmission system at a point in time. These characteristics include: a weakly meshed network operating to lower voltages than other regions; a small number of large directly-connected industrial customers, and a geographically dispersed distribution network customer load; a relatively large number of small generators with varying output levels at dispersed geographic locations; issues associated with the market for frequency control ancillary services (FCAS); a large direct current (DC) interconnector relative to region load and generation; and extensive use of dynamic transmission line ratings to release available capacity in real time.

The introduction of the proposed Optional Firm Access (OFA) model would be a fundamental change to the operation of the national electricity market (NEM).

Based on experience in Tasmania, Transend has identified three key technical challenges related to constraints that warrant careful quantitative consideration in further developing the AEMC's OFA model. These key technical challenges are outlined in Attachment A to this letter.

Transend recommends that any further evaluation of the OFA model consider the technical issues at a quantitative level. Whilst Transend has direct experience with these issues in Tasmania, such issues may impact on the OFA model applied to the entire NEM, and warrant careful analysis. Transend would be pleased to work with the AEMC as it continues to develop the OFA model.

In line with Grid Australia’s submission on this matter, Transend considers that the AEMC’s recommendation to the Standing Council on Energy and Resources (SCER) should be in the form of recommended next steps, and a proposed process and governance arrangements for taking those steps.

If you would like to discuss any of the issues outlined in this submission or require further information, please contact me on (03) 6274 3915.

Yours sincerely

Kirstan Wilding
NEM Strategy & Compliance Manager

Attachment A

1 Applicability of OFA to stability constraints

The AEMC's Technical Report[1] generally considers flowgates[2] in terms of thermal constraints, with the general comment that because other constraints take the same format in National Electricity Market Dispatch Engine, the OFA model applies to all types of transmission constraints. However, there are significant differences between stability and thermal constraints which affect practical applicability of the OFA model to both constraint types:

1.1 Stability constraints are influenced by equipment outside a TNSP's control:

Thermal constraints are caused by limitations of the transmission network, and are thus within the transmission network service provider's (TNSP) authority to alleviate. Stability constraints are influenced by the inherent characteristics of connected equipment, equipment settings, the transmission network, and prevailing power system conditions (e.g. load, dispatched generation). The characteristics of connected equipment, some equipment settings, load, and generation dispatch reflect decisions made by parties other than the TNSP. A TNSP may therefore be unable to be assured that its actions will achieve a particular stability constraint outcome or increase a stability constraint capacity at an economic price.

1.2 Stability constraints are technology dependent:

For transmission planning purposes, the prediction of future stability constraints capacity is highly challenging given the uncertainty around specific characteristics and settings of future generation plant.

1.3 Stability constraints may have highly time-varying capacity:

Because stability constraint capacity typically depends on time-varying external factors (e.g. generator on/off status, system load) the available constraint capacity will be almost always be dynamically varying. The following graph[3] shows the variation of the Tasmania west coast transient stability limit during the course of one week. The maximum value of this constraint's capacity (640 MW) is more than three times the minimum value (190 MW), demonstrating the highly variable nature of stability constraints.

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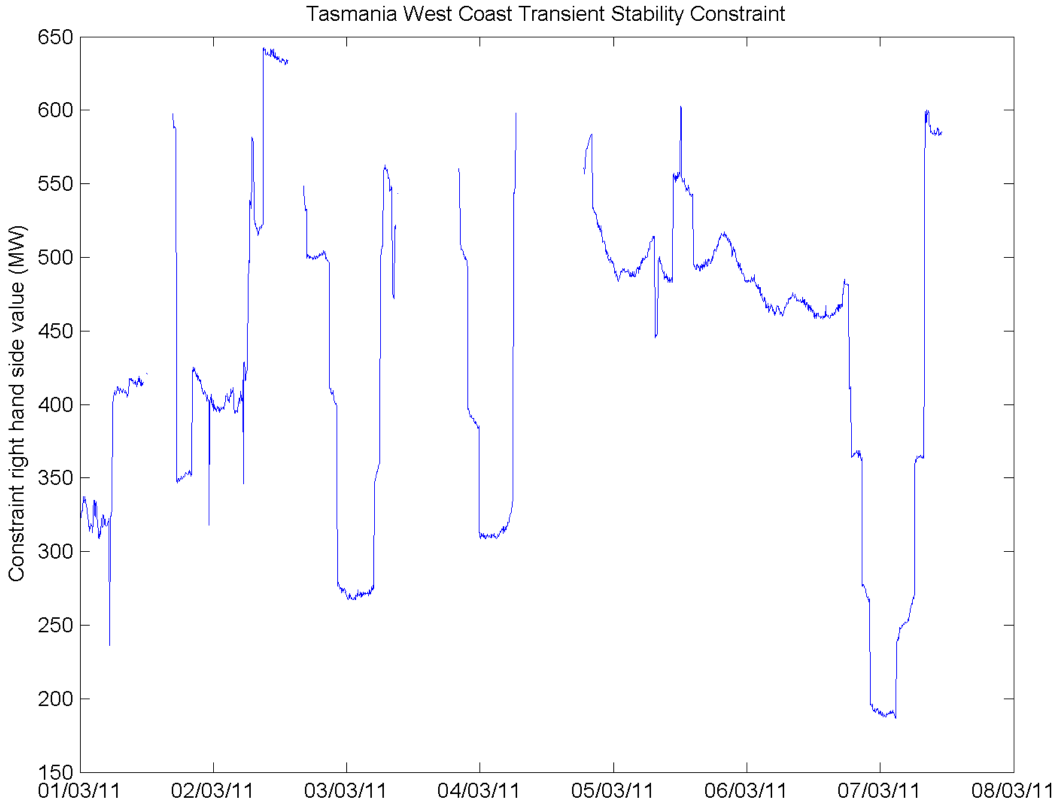
[1] *Technical Report: Optional Firm Access* section 4.2.2

[2] In this submission, Transend understands the terms flowgate (AEMC terminology) and constraint are interchangeable.

[3] T constraint (T::T_NIL_1) only applies when Basslink is importing power to Tasmania. The gaps in data correspond to times of Basslink export.

The implication of constraints with time-varying capacity in the context of the OFA model is discussed later in the submission under the section titled “Dynamic Line Ratings”.



1.4 Future erosion of stability constraint capacity:

The nature of stability constraints means that the connection of a future generator or load, possibly in a remote network location, may reduce a stability constraint’s capacity. Transend’s studies show that future connection of wind generation is expected to reduce existing Tasmanian stability limits[4]. Our studies also indicate that thermal constraint capacity could be reduced by the disconnection of a directly-connected major industrial customer.

Given the potential for existing or newly connecting generators to seek firm access agreements for the life of their plant, it is highly challenging for a TNSP to have certainty that the firm access it offers today can be physically available for the lifetime of the access agreement.

[4]Currently, such a reduction is allowable at the TNSP and AEMO’s discretion under Rule S5.2.5.12, provided the ability to supply customer load is not compromised.

1.5 Implications

In summary, to meet a generator's request for firm access, a TNSP must have a high degree of certainty that the access quantity is available at all times agreed, considering all individual constraints in which that generator participates. A transient stability constraint, which may bind infrequently and be very expensive to alleviate, may thus make the cost of providing a given level of access prohibitively high. Decisions made by existing and future generation and load will also affect stability constraints. Taken together, this suggests that the present OFA concept of defining access in terms of a MW quantity for a particular generator may understate the complexity and cost associated with providing this access in the presence of stability constraints.

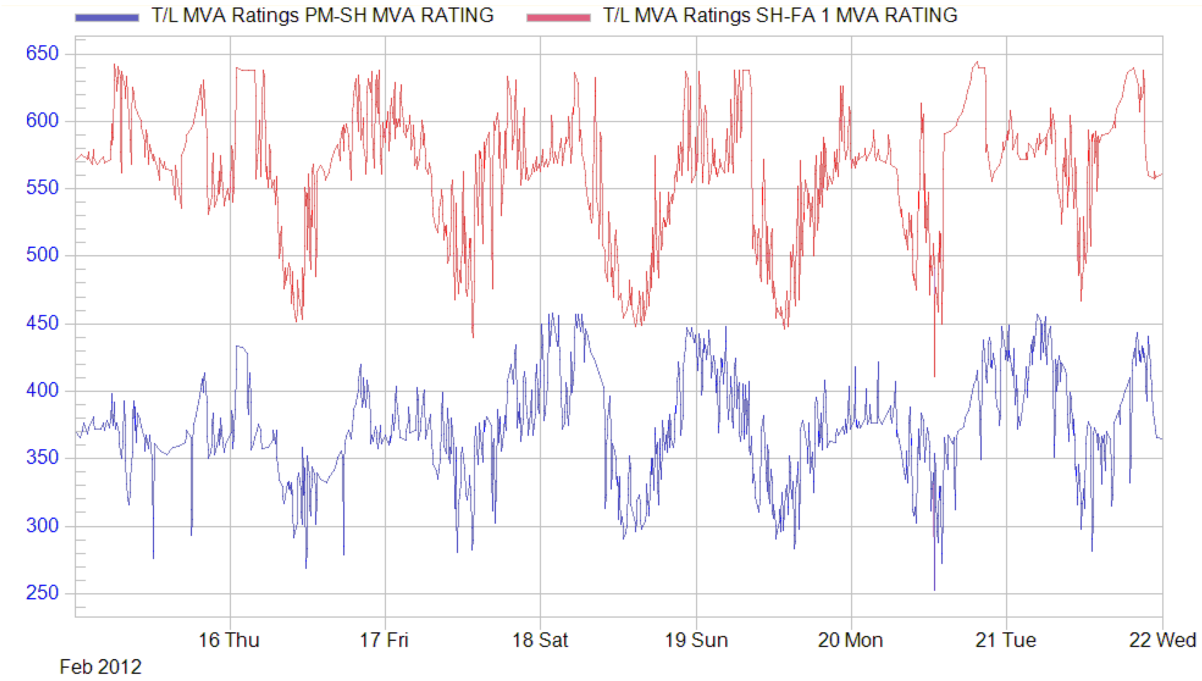
2 Dynamic line ratings

Transend has a history of implementing innovative solutions to transmission challenges, such as using transmission line dynamic ratings and network control schemes to release available capacity.

Transend utilises real-time transmission line ratings on all of its shared network transmission lines. Real-time ratings allow use of otherwise latent capacity during times when actual weather conditions are more favourable than the conservative conditions and ratings assumed during design.

Transend is the only TNSP to fully utilise dynamic ratings, although Transend understands the use of real-time transmission line ratings is increasing throughout the remainder of the NEM.

The thermal constraint capacities of Transend's lines are therefore not fixed, but – like stability constraints – vary dynamically. The graph below shows the variation in thermal rating for two of Transend's 220kV circuits during a summer week. The variation in capacity is clearly significant, despite no outage conditions being present.



It is unclear how the OFA model would accommodate constraints with highly variable capacity, such as dynamic line ratings and stability constraints. For example, in order to be certain it could meet its firm access capacity obligations, a TNSP may only be able offer firm access to that amount of a constraint's capacity which is always known to be available. As a consequence, providing additional firm access above this base amount would require transmission network augmentation. This could negate the present efficiencies from releasing available capacity in real-time via dynamic line ratings.

3 Frequency Control Ancillary Services constraints

The AEMC has advised Grid Australia members that OFA will not apply to FCAS constraints. Given FCAS is a market arrangement in which TNSPs are unable to participate, and therefore TNSPs cannot influence FCAS shortages, the AEMC's position appears sensible. However, in the Tasmanian region it is not unusual for generation to be constrained due to FCAS shortages.

While this has been a predominantly Tasmanian issue to date, with the anticipated greater penetration of renewable generation technologies in the NEM, this issue is expected to have greater national significance.

The AEMC needs to consider the implications of excluding FCAS from the OFA model design as it may further limit the intended potential benefits of the OFA model.