Hydro Tasmania
the renewable energy business

7 August 2008

Julian Eggleston
Reliability Panel
PO Box A2449
Sydney NSW 1235

By email: submission@aemc.gov.au

Dear Julian,

Review of Tasmanian Frequency Operating Standards – Supplementary Comments

Summarising the issues surrounding changing the FOS in Tasmania it can be seen that there are a number of differing perspectives surrounding the key factors. These key factors are;

- Increased R6 as a result of a tighter standard;
- UFLSS, OFGSS & SPS design changes as a result of tighter standards or mitigation of non-compliance; and
- Consequential increase in generator contingency size to 210MW.

This supplementary submission expresses an objective view of the advantages and disadvantages of the options specific to the key factors and then suggests a way forward for the next two year timeframe. The purpose of limiting assessment to two years is prefaced on the uncertainty around the Gunns pulp mill and generation plant being built, emissions trading scheme influence on renewables (mainly wind) development in Tasmania and the current drought effect on Tasmanian hydro power reserves.

UFLSS

From a purely objective perspective, under frequency load shedding should be viewed as a means of mitigating the effects of major generating unit multiple contingencies by minimising disruption to customers and the overall system restoration time. The prime goal of the UFLSS should then be to, as far as possible, maintain part of the electrical system intact thereby ensuring faster system restoration than for a complete system restart. A UFLSS scheme design cannot possibly ensure protection against all multiple contingency scenarios and such limitations should be acknowledged and understood. (For example a relatively small multiple contingency could result

in a system black out on a day when two potlines at Rio Tinto smelter are out of service).

In designing an UFLSS scheme, the design should provide protection against as many contingencies as practical (in contrast to possible), noting that certain extreme contingencies could result in system black out but that these events should be 1 in 10 to 15 year events.

In determining practicality, the amount of time saved by not needing to restart the system from 100% black should be a major consideration along with the frequency of such non-credible events. Any change to the UFLSS needs to be evaluated in terms of increased risk, where risk is a combination of probability and consequence. Both Hydro Tasmania and Alinta have proposed changes to the UFLSS, which will change the risk profile associated with the protection scheme.

Perhaps the most important data to consider in this instance is historical events that have resulted in minimum frequencies between 46 - 47Hz and 47 – 48Hz remembering that the Basslink frequency controller greatly assists with frequency response when Basslink is away from flow limits. This data supports the view that the majority of multiple contingencies are "small" and will not cause a frequency deviation below 47.0Hz and hence not trip Tamar Valley Power (TVP) and exacerbate the contingency.

Connection of Tamar Valley Power CCGT

R6 Quantity for a 48Hz Generation Event – It is recognised that an average increase of 20-30MW of R6 would be required to contain credible contingencies to the tighter standard of 48Hz with low inertia scenarios exacerbating the requirement. Alinta are effectively proposing the tightening of the credible contingency band to provide room to tighten the non-credible band; they can indeed comply with the existing 47.5Hz credible contingency band. Therefore, the driver to tighten the bands in this way is to achieve a connection agreement under the rules access standards. The current situation is that TVP cannot meet either the automatic or minimum access standards, however, clause 5.3.3(b3) states that there is another option in the form of a "*plant standard*" that can be determined by the *Reliability Panel*.

R6 Quantity for 210MW Contingency – Hydro Tasmania has previously proposed that the contingency size in Tasmania needs to be capped at 144MW to prevent severe shortages of the R6 required to cater for larger contingencies. Alinta have since provided modelling (ROAM Consulting) that concurs with the need to cap contingency size although it quotes 160MW as the upper limit. The difference in numbers is most likely due to using overstated FCAS trapezium data in the modelling (registered trapeziums) as compared to actual supply available (bid trapeziums) from current providers.

The ROAM modelling is also based on co-optimised output of the TVP plant, which is in contrast to the actual capability of the plant and would therefore

require a mechanism within the dispatch that achieved this independent of generators bids. This co-optimisation has been modelled to be a function of Tasmanian system demand and inertia and reduces the contingency impact during periods when either the FCAS requirement is much higher, eg due to weak systems and/or when global FCAS is limited due to Basslink energy flow (ie insufficient headroom). It does not recognise or address the issue of Basslink's transitioning through the no-go zone which separates the FCAS markets and requires local FCAS for all Tasmania contingencies for the dispatch intervals associated with reaching full transition.

In the absence of a proven mechanism to manage contingency size that addresses the increased local R6 for both high import and no-go zone transition previously described in the Hydro Tasmania submission, it would be prudent to use a fixed value of 144MW (documented in the Tasmania frequency standard). Any solution adopted needs to be codified to ensure that the solution is robust.

Gunns Pulp Mill and Generator

Various submissions refer to the proposed Gunns plant either to draw on possible similarities with the TVP connection issues or to tout additional inertia, UFLSS tripping and R6 availability in Tasmania. It is Hydro Tasmania's view that in the light of the Gunns plant still not being a guaranteed project, then it is best not to include it in any of the assumptions in regards R6 and simply note that it complies with the current under frequency standards but would have issues meeting over frequency standards.

Some of the other factors that could have substantial impact upon the Tasmanian system over the next few years in response to emissions trading include:

- Greater demand for renewable energy
- New wind farms (Musselroe and others)
- Different supply/demand balance in Tasmania

Need for Transition

Hydro Tasmania remains of the view that the current standards provide the best outcome for Tasmania with Alinta using a plant standard to connect and contingency size capped at 144MW.

A variation on our previous submission, recognising the value of the option to wait 2-3 years, would be to arrive at an interim solution and review standards once operational experience of CCGT operation in Tasmania. This would also allow a better assessment of the impact of both the ETS and Gunns project.

One way of achieving an interim solution (covering the next 2 to 3 years) would be to retain the current frequency standard (47.5 to 53.0Hz and 46.0 to 55.0Hz) for this period with the following measures applied:

- Control of contingency size (144MW) with load tripping and explore management by constraints.
- TVP to be included in UFLSS and requiring 140MW of additional load tripping (or as much as can be sourced that will lead to an adequate UFLSS as discussed earlier in this paper)
- Retaining the 53.0Hz upper frequency for network event with the knowledge that TVP will trip at 52.0Hz. This does not pose an increased risk to the Tasmanian system as the Bell Bay machines (240MW) have grandfathered performance standards and also trip at 52.0Hz. Studies carried out at the time showed that if a single Bell Bay machine was in service and Basslink tripped, the frequency would not exceed 52.0Hz (primarily due to the FCAS lower delivered by the Bell Bay machine). As such the risk of cascade machine tripping for a Basslink trip was considered negligibly small. If the TVP machine is capable of delivering around 50MW of L6 it could be compared to a former Bell Bay machine and the risk would be unchanged.

Conclusion

Hydro Tasmania believes that, as with the commissioning of Basslink and the associated uncertainties, there is much to be gained from applying a measured approach and applying the learning to future developments in Tasmania. If future development in Tasmania tilts the balance in favour of a frequency standard change then experience gained and more accurate knowledge will greatly assist the decision making at the time. In addition, once tightened, the standard effectively can not be relaxed. Any change to Tasmanian frequency standards should accommodate future development for at least 5 to 10 years and this picture is not clear enough today to ensure the right decisions are made to cover that time domain.

If you have any queries, please contact the undersigned.

Yours sincerely,

D. Bowker

David Bowker
Manager Regulatory Affairs