NEMMCO
National Electricity Market Management Company Ltd
ABN 94 072 010 327
Norwest Office

Michael Brewster
Chief Executive Officer
AETV Power
GPO Box 1298
Hobart
Tasmania 7001

Dear Michael

AETV PARTICIPANT DEROGATION

I refer to your letter of 20 March 2009 seeking a letter of support from NEMMCO for AETV's proposed participant derogation to clause S5.2.5.3 (c) of the National Electricity Rules (Rules) for Aurora Energy Tamar Valley (AETV) Combined Cycle Gas Turbine (CCGT).

The new Tasmanian Frequency Operating Standards (FOS) as determined by the AEMC is not scheduled to come into force until later in 2009. However AETV wishes to commence commissioning by late April/early May. NEMMCO is required to ensure that new generators must meet at least the minimum access standards. Therefore AETV CCGT will be required to meet the technical requirements of Chapter 5 of the Rules to be registered. As the new CCGT generator is unable to meet the current Tasmanian frequency operating standards. It therefore seeking a derogation to the minimum access standard - Generating Unit Response to Frequency Disturbances. This access standard requires generating units to be capable of continuous uninterrupted operation for frequencies within the ranges of clause S5.2.5.3 (c) (1) to (6).

The derogation would allow NEMMCO to register the AETV generator and thus proceed with commissioning. Until the new Tasmanian FOS come into effect AETV have offered to make operational arrangements if NEMMCO or Transend considers it necessary to ensure system security is not jeopardised.

NEMMCO has considered the derogation in terms of possible impacts it may have NEMMCO's ability to manage system security. NEMMCO considers that if the derogation is granted then the risk to power system security is not increased as it is defined within the National Electricity Rules.

However if the CCGT plant were to be operating in accordance with the proposed derogation some non credible contingency events may have a much larger consequence for the Tasmanian power system than would otherwise be the case.

Mansfield Office
PO Box 2516
Mansfield QLD 4122
Tel: (07) 3347 3100
Fax: (07) 3347 3200

Melbourne Office
Level 12
15 William Street
Melbourne VIC 3000
Tel: (03) 9648 8777
Fax: (03) 9648 8778

Norwest Office
PO Box 7326
Baulkham Hills BC NSW 2153
Tel: (02) 8884 5000
Fax: (02) 8884 5500

Sydney Office
Level 22, Norwich House
6-10 O'Connell Street
Sydney NSW 2000
Tel: (02) 9239 9199
Fax: (02) 9233 1965

NEMMCO considers that if the AETV generator were granted the derogation that it is possible for some improbable but possible power system events to lead to the tripping of the AETV generator which would then result in an increase in the loss of load and/or generation in Tasmania than would otherwise be the case. NEMMCO has not had an opportunity to fully quantify all the issues outlined in the scenarios listed below and the analysis of the scenarios represents only a preliminary analysis intended only to illustrate the issues involved In addition there may be other similar scenarios.

NEMMCO understands that detailed studies have been commissioned by AETV to consider the technical impacts of the proposed derogation.

Scenario 1

Basslink trips at full import (480 MW) and a major generating unit (120 MW) fails to ride through the frequency disturbance whilst the AETV CCGT is operating at 210 MW with 70 MW of GCS load armed. Under these conditions there is likely to be also about 80 MW of fast raise FCAS enabled in Tasmania (sufficient to keep frequency above 47.5 Hz after loss of the 120 MW generating unit)

Following the loss of Basslink and the major generating unit the frequency will likely fall to below 47.0 Hz and the AETV CCGT is likely to trip. This is because much of the load connected to the UFLS with settings above 47.0 Hz is also connected to the Basslink SPS and will be tripped first by the Basslink SPS and so there will only be a small amount of UFLS load left with settings above 47.0 Hz.

There are a number of possibilities here

(a) GCS load is also armed for Basslink SPS

(b) GCS load is connected to UFLS at a setting between 47.5 and 47.0 Hz

(c) GCS load is connected to UFLS at a setting below 47.0 Hz

(d) GCS load is not connected to UFLS

However a review of all these possibilities suggests that total load shed (i.e. by Basslink SPS ,UFLS, enabled FCAS or AETV GCS) would be in almost all cases be in the order of

480 + (210 - 70) + 70 – 80 = **610 MW**

This load would exceed 60 % of total regional load under light load conditions and so minimum frequency may not be kept above 46.0 Hz. Thus as a result of these events there could be loss of a number of existing generators possibly leading to a significant system collapse condition.

However it should be noted there are also improbable but possible system events which currently could result in the Tasmanian frequency falling below 46 Hz. Thus the derogation would not introduce a new risk but would only increase the level of the risk.

Scenario 2

A major generator unit (120MW) trips and two further major generating units (2 * 120 MW) then trip. It is assumed there is sufficient raise FCAS to cover the loss of first 120 MW unit (say 80 MW).

Under this condition frequency is likely to drop below 47.0 Hz as there may not be sufficient load connected to UFLS with settings above 47.0 Hz to prevent the frequency falling below 47.0 Hz and so the CCGT could trip.

There are three possibilities here

(a) GCS load is connected to UFLS at a setting between 47.5 and 47.0 Hz

(b) GCS load is connected to UFLS at a setting below 47.0 Hz

(c) GCS load is not connected to UFLS

Total load shed for (a) would be 2*120 MW + 210 MW = 350 MW

Total load shed for (c) would be 2* 120 + (210- 70) + 70 = 350 MW

Because of the contribution of the raise FCAS would the total load shed be expected to be less than this say 350 -80 = 270 MW

This load would be less than 60 % of total regional load even under light load conditions and so minimum frequency should remain above 46.0 Hz.

Scenario 3

This scenario would involve unexpected loss of both Farrell - Sheffield lines with high generation in the North West (450 MW less 50 MW local load) and Basslink operating at zero or low levels of export. It is assumed that there is sufficient FCAS to cover loss of 120 MW of generation (say 80 MW).

Under these conditions it is possible that frequency may fall below 47.0 Hz under light load conditions and if so the CCGT is likely to trip and total load interrupted of the order of

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400 -120 + (210-70) + 70 – 80 = 510 MW

which would approach 60% of the load under light load conditions meaning that the minimum frequency would fall close to 46.0 Hz under such conditions.

Yours Sincerely

Mark Miller
General Manager Operations