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Management Company Ltd

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Sydney

23 May 2008

Mr Ian Woodward
Chairman
AEMC Reliability Panel
Level 5, 201 Elizabeth Street
Sydney NSW 2000

Dear Ian,

Reliability Panel Comprehensive Reliability Review – Advice on Tasmanian Frequency Operating Standards

As indicated in your letter of 13 May 2008 NEMMCO has been in contact with the AEMC staff regarding the Transend / Michael Hill report on proposed changes to the frequency operating standard in the Tasmanian region. NEMMCO's review of this report has not identified any issues with the methodology used for the study. The study has been conducted and reviewed by those with considerable experience in this field and detailed knowledge of the Tasmanian Power System. However, NEMMCO has some concerns regarding the assumptions used in those studies and believes further work is required in some areas as identified below.

1. ASSUMPTIONS

NEMMCO has concerns with some of the assumptions used as a starting point for the studies as follows:

1(a) Multiple Contingency Events

In section 7.1.2 of the report the operation of the under frequency load shedding (UFLS) system has been studied only for loss of generation events of up to 400 MW. The rationale for this is set out in Section 9.5 of the report which restricts the scenarios studied to ones caused by single non-credible contingencies. However large loss of generation can also be caused by cascading multiple events such as those which occurred on 13 August 2004 on the mainland and on 23 May 2006 in the Tasmanian region. The National Electricity Rules (Rules) as evidenced by Clause 4.3.1(k) have a clear expectation that emergency systems such as the UFLS system should be designed to adequately manage loss of generation events as high as 60% of System Demand. Thus NEMMCO's view is that the performance of any proposed UFLS system should be studied for contingencies as large as 540 MW under light load conditions. This is particularly important as the range over which the UFLS

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scheme is required to operate (1.0 Hz) is very narrow. Previous work by NEMMCO concluded that adequate operation of the scheme for ranges smaller than 1.5 Hz would present significant challenges.

1(b) Assumptions Regarding Light Load Conditions

The report is not explicit as to what loading level in Tasmania is used for studies of light load condition scenarios. However from table 7.2 in Section 7.1.2 it is inferred that this loading level is 1090 MW including losses. A review by NEMMCO of loading conditions over the past year[1] has indicated that the loading level is less than 1090 MW for about 35% of the time and is less than 940 MW for about 5% of the time and consistently falls below 900 MW. On this basis it is suggested that a demand of 900 MW should be assumed for studies of light load conditions.

From table 7.2 in Section 7.1.2 in the report it is also inferred that a Basslink loading level of 407 MW has been assumed for light load conditions. A review by NEMMCO over the past year has found that import levels of as high as 478 MW have been achieved. Considering low demand periods (i.e. those less than 940 MW) only, the import level has been as high as 440 MW. For this reason it is suggested that an assumption of a Basslink loading of at least 440 MW during light load conditions is more appropriate.

1(c) Assumptions Regarding Future Generation Developments

Any decision on a change to the frequency operating standard would not be a short term decision and needs to take into account any reasonably foreseeable developments over at the least the next three years. This report does attempt to address this by also looking at the possible Gunns development. However another reasonably foreseeable development which has not been taken into account is future windfarm developments in Tasmania. NEMMCO believes that it would be reasonable in such studies to assume at least another 130 MW wind farm. As this wind farm would be expected to be located well away from the existing wind farms one would expect a reasonable diversity in wind farm output. Looking at the diversity between two well separated wind farms in the South Australian region, NEMMCO suggests that a diversity factor of 60% would be appropriate. Thus for studies with high wind farm output, assuming a value of 162 MW [2] for total wind farm output would be appropriate.

1(d) Management of Load Events

Table 9.5 in the report indicates that load events have not been studied. This is presumably because, as indicated in the section (i) of the Report's Executive Summary, it is assumed that the Alinta Plant would provide significant lower FCAS capability. The proposed change in the frequency standard will lower the over frequency limit for network load events from 53.0 Hz to 52 Hz. This is likely to increase fast lower FCAS requirements due to:

- The reduction in load relief - equivalent to 20 MW for a Tasmanian demand of 1000 MW; and

[1] This is based upon operational demand which includes system losses and load supplied by significant non-scheduled generating units

[2] 162 MW = 60% of (140 MW + 130 MW)

- The reduction in the discounting of the lower 6 second FCAS requirement for network events in Tasmania - the lower 6 second requirement in Tasmania is currently multiplied by a factor of 0.4 to account for the additional governor response that can be provided for the 3 Hz frequency deviation associated with this event compared to the 1 Hz deviation on which the service definition is based. If the frequency deviation is reduced to 2 Hz as proposed the amount of discounting will most likely need to be reduced. This could significantly increase the amount of lower 6 second service required.

Fast lower services have proven to be difficult to procure under the present arrangements and satisfying the requirement is likely to be possible under the proposed arrangements only if there is a substantial increase in the supply of these services. However NEMMCO foresees a number of issues which need to be considered:

- The change in the frequency standard does not guarantee that either Alinta or the proposed Gunns project will actually offer these services ; and
- The change in the frequency standard for load events will apply even if both the Alinta plant and the Gunns plant are out of service.

1(e) Management of Over Frequency due to Multiple Contingency Events

The proposed frequency operating standard would mean that continued operation of the Alinta or the Gunn Plant would not be guaranteed if the frequency rose above 52Hz. The Report as indicated in Section 4 assumes that this issue can be managed by incorporating the plant into the over frequency generating shedding scheme (OFGSS) at 52 Hz. There are a number of difficulties which need to be addressed for this proposal:

- The same arrangement would have to apply to both the Alinta plant and the proposed Gunns plant; and
- In order to avoid generator tripping for network load events, the settings would need to be set slightly above 52 Hz with some time delay to allow proper discrimination. Thus plant would need to be capable of operating to some extent above 52 Hz for short periods. It is unclear whether or not this is feasible.

2. FURTHER WORK

The current Report (version F2.0) acknowledges that further analysis is required in some areas. Particular areas where NEMMCO believes that further work is required are as follows:

2(a) Ability to Procure Required FCAS

The Report sets out in Section 9.3.4 the methodology used in the studies to determine whether sufficient FCAS can be procured to meet the increased requirements for generator events and loss of Basslink.

The report indicates that sufficient raise FCAS would be available. However, detailed results are not provided, nor historical review of the availability of FCAS. In the absence of such

detailed results, a definitive statement cannot be made as to whether or not it is likely that such services could be provided under all reasonable conditions and also as to what impact the need to meet this additional requirement would have on the efficient dispatch of energy.

The effect of inertia on FCAS requirements will need to be considered, particularly at times of low Tasmanian region demand. Typical Tasmanian FCAS raise requirements to cover the loss of the largest generating unit for the current and proposed frequency standards are tabled below to illustrate this.

Tas Demand	900	1000	1400	1800
47.5 Hz + 144 MW loss	95.2	89.9	66.7	47
48 Hz + 144 MW loss	125.7	116.8	81.5	64.5
47.5 Hz + 210 MW loss	224.8	210.9	132.2	109.3
48 Hz + 210 MW loss	306.5	290.5	159.8	129.4
Tas Inertia	4500	4600	7300	9700

As mentioned earlier, network load events have not been studied and so there appears to be no indication as to whether there would be sufficient lower FCAS available to meet the increased requirements for normal network load events.

If sufficient FCAS could not be procured under certain conditions, then NEMMCO could be forced at times to constrain flow on Basslink or the output of the largest Tasmanian generating unit to ensure that the frequency standard is met.

In the case of Basslink export, lower FCAS requirements could be reduced by including both the Alinta and Gunns plant in the Basslink FCSPS but there is no evidence that this will indeed be the case.

2(b) Discrimination between Basslink FCSPS and UFLS Scheme

As acknowledged in Section 7.2.1, the Report has not yet demonstrated that the proposed changes to the UFLS scheme are such that there is adequate discrimination between it and the Basslink Frequency Control Special Protection Scheme for loss of Basslink at full import level (i.e. about 475 MW).

2(c) Generator Performance Standards

In Section 2 of the Report, the issue of the interpretation of the generator performance standard for S5.2.5.3 is raised. NEMMCO's position is that the limit of frequency rate of change of 1Hz /second applies only to the minimum standard not to the automatic standard which has a limit of 4Hz /second. NEMMCO would agree to the adoption of this minimum access standard for new plant only if the UFLS scheme and FCSPS could be set such that the expected rate of change of frequency following loss of generating events up to 60% of system load would be less than 1Hz/sec without creating a material risk of UFLS operation for generation or network events.

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In section 3 of the Report the difference between plant performance for frequency deviations under the minimum and automatic standards is outlined. However the Report is unclear as to which performance has been assumed in the studies which have been undertaken.

Please contact Michael Lyons on (03) 9648 8792 if you wish to discuss this matter further.

Yours faithfully,

Brian Spalding

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Chief Operating Officer