23 June 2006

Dr John Tamblyn
Chairman
Australian Energy Market Commission
PO Box H166
Australia Square NSW 1215

Dear Dr Tamblyn,

National Electricity Amendment
(Technical Standards for Wind Generation) Rule

The Australian Wind Energy Association (Auswind) represents all major wind turbine manufacturers, wind farm owners and developers. We have more than 100 members in all regions of the NEM (see attachment B) representing $1.7 billion of capital investment in existing wind farms and the potential for $13 billion of new investment.

Auswind participated in the TSRG and has given careful consideration to the package of changes developed by NEMMCO. It is evident that this package of changes goes well beyond those necessary to connect wind farms. It is a wide set of alterations for the setting and registering of performance standards.

Auswind understands that a process is under way between the AER, the AEMC, NEMMCO and the NGF for a derogation to reopen the development of technical performance standards and compliance plans for plant existing at the performance standards commencement date. Auswind has been concerned for some time with the current rules and the difficult process for registering the performance standards of plant existing at the performance standards commencement date and supports the derogation process.

Auswind has concentrated its efforts on the rule changes in Schedule 5 as these have the greatest affect on a generator's ability to connect. There are a number of positive and non-controversial rule changes which can be supported, which we list below. However we have found a number of rule changes and sub sections of rule changes that we consider controversial in this package and would want to see resolved through further consultative work with the broader industry.

In preparing this submission Auswind has included comments from power system engineering specialists within the electricity industry. Collectively their engineering work has covered:

- connection of wind generation projects in both transmission and distribution,
- transmission and distribution system planning,
- dynamic modelling and simulation,
- wind farm fault ride-through studies,
- system transient analysis,
- design and calculation of inter-regional transfer limits,
- harmonic studies,

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- system reliability studies,
- synchronous generator testing and analysis,
- synchronous generator control system parameter setting, and
- system operations.

Technical standards that provide for reliable system performance and sound system management are essential for the ongoing integration of wind energy and other renewable energy sources. It is evident that wind turbine manufacturers have been pursuing improved levels of performance following required increases in performance for connection to the European and other large international grids.

Australia is a small market in global terms yet it stands to benefit from the clarification of connection requirements in Europe as this has had a flow on affect via the manufacturers on the performance and control of wind turbines. In the last three years significant improvements have been made to the various technologies. This means that even within the same project, the turbine that is eventually purchased at financial close is unlikely to be the same turbine that was considered at the start of a project.

Auswind supports positive non-controversial changes which will allow the planning and grid integration of wind energy to continue. We understand NEMMCO's requirements for adequate performance, reliability, information and modelling so that power system security can be maintained. However, we find that many of these changes are focused on correcting issues with the creation, registration and correction of the existing technical performance standards. To this end, Auswind supports the efforts of the NGF for clarification of the framework within which the technical standards are applied and managed.

To aid the AEMC, we have prepared a detailed set of comments on the most serious concerns that we have on clauses S5.2.5.3 A, B and C. We have paid particular attention to the sections which we find incompatible with the market objectives, Australian standards, or where power system realities are not being considered. These comments are contained in Attachment A. Detailed comments on each clause follow in Attachment C, this includes comments on those clauses we agree and disagree with as well as those that could be accepted with minor modifications.

In preparing this submission Auswind has worked closely with REGA and has also consulted the NGF.

If you have any questions or need any clarification on this please contact Kate Summers on (03) 9615 6442 or email ksummers@pacifichydro.com.au.

Yours sincerely

Dominique La Fontaine
CEO,
Auswind

Attachment A - Rule Changes – Further Issues.

S5.2.5.3 A. Generating Unit Response to System Frequency - Controversial

The philosophy behind the minimum standard is meant to mean that if you cannot meet this standard you are not allowed to connect to the system. This was widely discussed and agreed at the TSRG. The minimum standard as NEMMCO have written it, in accordance with the Reliability Panel's frequency settings, means that many different technologies will be excluded from connection to the NEM. This will be particularly so in the Tasmanian region. The end result of making the minimum access standard an obligation to meet the extreme frequency excursion limits on all new generators, will greatly reduce the types of turbines and generator technologies eligible to connect to the NEM, this directly reduces competition and will increase cost.

If the minimum performance is going to fixed to the extreme frequency excursion limits which is where the system goes under catastrophic failure, then its unlikely that the following technologies are ineligible for connection (particularly in Tasmania):

- Wind turbines designed to meet the UTCE and Eon standards, of 47.5 Hz - 51.5 Hz.
- Bagasse units,
- Gas turbines,
- Biomass units
- Some steam sets.

The Reliability Panel determination on the frequency standards Sept 2001 state that 'This band (47 -52Hz) is largely determined by the capability of the generating units, any relaxing of it would require upgrading of plant, which would be unrealistic to impose. Also there is no obvious benefit in tightening it.' It appears at that time, that competition for supply of small distributed generating units for connection to the NEM was not in mind when this determination was made. Nor was it evident that the frequency standard would be applied as a hard wired minimum standard on all connecting plant.

NEMMCO set the under frequency load shedding schemes, these settings determine how long the system stays below 47.5 Hz, whether it will balance before recovering (delaying recovering) or whether it return promptly to 50Hz. Fast recovery of the system via UFLS from extremely low frequency events will ensure that, as many machines as possible remain synchronised and connected.

S5.2.5.3 C Generating Unit Response to disturbances following contingency events.
Controversial, some sub clauses are not acceptable.

NEMMCO have made considerable effort to extend the generator requirement to ride through system faults, both transmission and distribution. However, they have added a requirement to ride through reclosures which is an entirely new requirement for all generators.

There is no specification on how many reclosures a generator is expected to ride through, nor do TNSPs have a standard reclosure delay time. This can have a significant impact on generators, particularly if the reclosure is very fast (less than 1 sec between fault clearance and reclosure such as in SA). A fast reclosure onto a sustained fault contributes additional power swing into the system at a time when it has not settled from the initial fault. Further discussion is required on this aspect of the clause.

The clause clarifies the transmission faults and their timing well.

The problem is, (b) (1) (iv) sets the fault ride through in distribution to be harder to meet than that for transmission. Medium size wind farms can be connected to distribution networks operating at 132 and 66kV. Fault statistics indicate that three phase faults have a very low probability on such lines. The requirement to be cleared in back-up protection times is excessive compared with the requirement for transmission faults to be cleared by primary protection. Auswind request that the requirements for fault ride through in distribution be the same as those for transmission.

(b)(2)(ii) fault recovery – requirement to deliver 95% of pre fault power within 100 ms of the event. – This requirement must be considered in terms of both large units connected to the transmission system backbone as well as generating systems in weak distribution networks.

Compliance testing: NEMMCO have made a point of saying that a standard should be able to be tested, yet there is no way to perform fault throwing tests on the system. Consideration must be given to work out how generators can prove compliance with this requirement..

S5.2.5.3B Generating Unit Response to Voltage Disturbances.
Minor Comments - Non-controversial

Auswind agree in principle with this clause but have to comment that there has been considerable confusion in interpreting. Some of the confusion arises from a drafting error in the existing rules, and we request that the Commission consider correcting the error in this round of changes.

The rule S5.2.5.3B refers to S5.1a.4, in the second paragraph of S5.1a.4 in the current standards states:
"As a consequence of a *credible contingency event*, the *voltage* of *supply* at a *connection point* should not rise above its normal voltage by more than a given percentage of **normal** voltage for longer than the corresponding period shown in Figure S5.1a.1 for that percentage."

Auswind request a correction to S5.1a.4 to read:

"As a consequence of a *credible contingency event*, the *voltage* of *supply* at a *connection point* should not rise above its normal voltage by more than a given percentage of **nominal** voltage for longer than the corresponding period shown in Figure S5.1a.1 for that percentage."

The definition of nominal voltage in the glossary refers to the design voltage of the equipment, the Australian Standards (AS2060038-2000 Standard Voltages) define **'nominal system**

voltage' this is a straightforward definition. It defines the designated system voltage. In legal terms the word nominal may have a different meaning to that commonly used in electrical engineering. However it should be legally recognized that Design and Construction contracts use the Australian Standards and the terms defined in the Standards as this is what equipment is manufactured to meet.

In Clause S5.2.5.3 B (c) NEMMCO have set the requirement such that every large unit (>100MW) connecting to the system must meet the automatic standard as this is the logical extension of the requirements for negotiation. If this was meant to capture wind farms in distribution systems, which was discussed at the TSRG, then it should read 'Each *generating system*'. Again there has been debate over this clause and it meaning in some cases Auswind believe that it can be interpreted to mean that all generators over 100 MW (as single units) must meet the automatic standard.

Auswind understands that 'normal' voltage as defined in the glossary and referred to in S5.1a.4 must be maintained within a range of ±10% in accordance with Australian Standards and that the normal voltages within a generating system are the voltages determined by the system controls within the regulating range of those controls.