

28 November 2006

Dr John Tamblyn  
Chairman  
Australian Energy Market Commission  
Level 16  
1 Margaret Street  
SYDNEY NSW 2000

Dear Dr Tamblyn

**DRAFT DETERMINATION ON RULE CHANGE ON TECHNICAL STANDARDS FOR WIND GENERATION**

Roaring 40s welcomes the opportunity to comment upon the Draft Rule on Technical Standards for Wind Generation and commends the AEMC on the many improvements to the existing regulatory framework presented in the Draft Rule.

In assessing the Draft Rule, Roaring 40s have focused on understanding how the Draft Rule would have impacted on wind generation projects we have developed in recent years, and more importantly, projects which are still under development. The provisions identified as being likely to result in substantive economic impact are:-

- the frequency ride through provisions contained within the Draft Rule, when applied in conjunction with the Tasmanian frequency operating standards, result in a requirement in-excess of the provisions that apply under the existing Rules. It is understood that NEMMCO will be proposing a practical resolution of this issue, which Roaring 40s supports. Further detail is provided in Appendix A;
- further consideration of the information disclosure provisions is required given the significant costs that can arise as a result of such provisions. A detailed discussion of these matters is provided in Appendix B for the purpose of informing deliberations around the specific provisions of the Draft Rules;
- requirements to provide or release technical information such as that contained in the Generator System Model Guidelines, Generator System Design Data Sheet and Generating System Setting Data Sheets can have substantial economic impacts. As such, the detail of these requirements should be contained in the Rules, rather than NEMMCO procedures, to ensure the appropriate level of governance

and consideration of economic impacts are applied. This issue is further examined in Appendix B;

- system and plant standards in Australia should be harmonised with international standards to the extent practical. It needs to be recognised that the Australian national electricity market has little ability to influence generation plant design standards of major world markets. This issue is further examined in Appendix C;
- the voltage disturbance ride through and fault ride through provisions should be enhanced to reduce the cost of connecting wind farms to the network while ensuring system security and reliability. This issue is further examined in Appendix D;
- the provisions for control of reactive power output should be enhanced to give better integration of wind farm reactive capability into overall system voltage control, potentially at lower cost. This issue is further examined in Appendix E; and
- the system standard for over voltage disturbance should be reviewed to ensure the cost of ensuring plant can operate within this standard is commensurate with the benefits of the relatively broad standard (by international standards). This issue is further examined in Appendix F.

Further to these comments, Roaring 40s will be presenting more detailed, “clause by clause” considerations through the joint wind industry submission by REGA and Auswind.

Roaring 40s acknowledges the complex nature of the technical, economic and regulatory considerations associated with the issues raised, and is happy to discuss further the issues identified in this submission. I can be contacted on phone 0400 537 944, or email [andrew.jones@roaring40s.com.au](mailto:andrew.jones@roaring40s.com.au).

Yours faithfully

Andrew Jones  
Manager Grid Integration

## Appendix A:

The proposed frequency ride through minimum access standard should be modified to avoid creating a new and onerous barrier to further development of wind generation in Tasmania.

### Reference in Draft Rule - Clause S5.2.5.3(c)

The minimum access standard for frequency disturbance ride through will reduce the potential for further connection of wind turbine generators in the Tasmanian system. This is due to the Tasmanian region having wider frequency operating standards to the remainder of the NEM.

Specifically, the new high frequency ride through requirements are in excess of the capability of turbines we have been offered to date in the Australian market, and indeed exceed the design standard implied by conjunction of the existing clause S5.2.5.3 of the NER and the current Tasmanian frequency operating standards.

### Efficiency considerations

This rule would create a barrier to participation of new Tasmanian wind generation in the NEM which is detrimental to the efficiency for the following reasons:-

- wind turbine generators will not be able to compete effectively with other forms of generation technology, irrespective of relative costs; and
- new Tasmanian wind generation is identified as being 15% more cost effective than South Australian wind generation and 30% more cost effective than Victorian wind generation in the recently released "NSW Renewable Energy Target Explanatory Paper".<sup>1</sup> This implies that, to the extent that Tasmanian wind generation can be utilised to meet this or similar targets, the exclusion of Tasmanian wind generation will increase the cost of meeting this proportion of the target by at least 15%.

### Proposed Solution

It is understood that NEMMCO will be proposing changes to Clause S5.2.5.3(c)(5) as detailed below, which would resolve this issue. Roaring40s supports this change.

#### Clause S5.2.5.3(c)(5)

the upper bound of the *normal operating frequency band* and to the upper bound of the *operational frequency tolerance band* for at least the recovery time, including any time spent in the ranges under subparagraph (6), unless the *generating system* has a *protection system* to trip a *generating unit* if the *frequency* exceeds a level agreed with NEMMCO; and

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<sup>1</sup> <http://www.deus.nsw.gov.au/Publications/NRET%20Explanatory%20Paper%20FINAL.pdf>

## Appendix B

Requirements to provide or release technical information can have substantial economic impacts. As such the detail of these requirements should be contained in the Rules to ensure the appropriate level of governance and consideration of economic impacts.

### Reference in Draft Rule - Clause S5.5.7

This clause effectively gives NEMMCO custodianship of the production and future amendment of the Generating System Design Data Sheet, the Generating System Setting Data Sheet, and the Generating System Model Guidelines.

### Issues arising from NEMMCO custodianship

Instances have occurred where wind turbine generators have been prevented from generating due to the Generator Registration process being delayed. These delays have occurred due to the difficulties associated with satisfying NEMMCO's demand for information. The cost of these delays can be in order of \$500,000 per week for a larger wind farm. The risk for this delay, and the cost involved is usually borne initially by the Developer or the Wind Turbine Supplier, and in any case is reflected the end use price of energy. Roaring 40s suggest that in many cases the cost of the delays incurred outweigh the value of reduced operational safety margins that would result from more precise modelling, especially considering the size and electrical location of the project within the network. If the information requested was technically and contractually possible for the Developer to supply, or not of high intellectual property value to the Wind Turbine Supplier, the information would be supplied without delay.

### Issues associated with disclosure of intellectual property.

In the Draft Rule Determination document it is stated (on page 51) that: "In seeking the ability to release information, NEMMCO is attempting to encourage the development of the local market for wind generation technology in particular." Roaring 40s do not believe that NEMMCO should have the ability to request information that is not directly associated with their primary role, and suggest that the motive of developing a local market should not be considered in relation to this issue. A reasonable way to ensure that the information requested is fully justifiable from a system security and operation point of view is to make it subject to the NER rule change process.

If wind turbine suppliers are required to divulge high value intellectual property in order to be involved in the Australian market, it is likely that this will discourage manufacturers from participating in the Australian market, or possibly restrict the range of product offered. Restricted product offerings due to intellectual property issues are evident in other countries such as China (due to IP concerns) and the US (due to IP patent infringement issues). It appears that this phenomenon is causing substantive economic detriment to these markets by reducing competition between suppliers and excluding more efficient "latest generation" turbines in the case of China.

The Australian market is small and the wind turbine supply margins are low. In the current global environment where demand for turbines is well in excess of supply, Australia it is not perceived as a long-term attractive market to wind turbine

suppliers. In this environment, the costs arising from dealing with 'Australia specific' information requirements and either real or perceived threats to intellectual property rights will cause substantial economic harm to Australian electricity users.

### **Suggested resolution**

Roaring 40s considers that the overarching economic implications of technical information provision and release are best managed by the AEMC, with the appropriate documents reproduced in the body of the NER, and therefore subject to the governance arrangements of the NER including the rule change process.

While we consider it entirely appropriate and indeed desirable for NEMMCO (as the market operator) to take the lead role in developing these provisions, there are substantial risks in placing ultimate custodianship of these provisions with NEMMCO. These risks are discussed below:

Despite best efforts to the contrary, NEMMCO is likely to struggle in objectively balancing costs and benefits of information disclosure provisions due to NEMMCO's reliance on such information for internal purposes. Effectively NEMMCO will be given the role of arbitrating a process for which it has a substantive interest in the outcomes of the process. This is not consistent with generally accepted principles of good regulatory design.

It may be argued that the alternative of managing these information requirements through the Rule change process is unnecessarily cumbersome. Roaring 40s is of the view that, provided the necessary high level of rigour is applied to the initial specification of information disclosure, these provisions will require minimal on-going change. Further, unless proposed changes are identified as having potentially substantive detriment; changes to these provisions would be progressed through the streamlined 'non-contentious Rule request' provisions of the NEL.

## Appendix C

Increased potential for reducing the cost of connecting wind farms to the network while ensuring system security and reliability can be achieved through minor changes to the proposed fault and voltage disturbance ride through provisions of the Draft Rule.

### Reference in Draft Rule - Clause S5.2.5.4

Roaring 40s is generally supportive of the clarity and flexibility provided by the proposed Rule.

It is noted that the clause S5.2.5.4(c)(2) creates the provision for generation not in excess of 100MW being disconnected on fault.

Given the safeguards to quality of supply and maintenance of transfer limits created by clause S5.2.5.4(c)(3) there would be no material adverse impact on the quality of *supply* to other *Network Users* or on *inter-regional* or *intraregional power transfer capability*. Therefore, the only limitation on the amount of generation which could be tripped will be the availability of FCAS to manage the subsequent frequency disturbance.

On this basis it is suggested that the 100MW threshold could be replaced with the size of the largest generation unit currently in the region. Alternatively this threshold could be increased to 144MW, being the largest machine in the Tasmanian region.

Increasing this threshold will not compromise system security and reliability while increasing the potential to reduce the cost of connecting wind generation to electrically remote sections of the network by allowing greater flexibility in turbine selection, and/or reduced requirements for auxiliary reactive equipment.

### Fault ride through - Clause S5.2.5.5

Roaring 40s is generally supportive of the clarity and flexibility provided by the proposed Rule.

It is noted that the clause S5.2.5.5(c)(1)(ii)(A) creates the provision for generation not in excess of 100MW being disconnected on fault.

Given the safeguards to quality of supply and maintenance of transfer limits created clauses S5.2.5.5(c)(1)(ii)(B) and (C) respectively, the only limitation on the amount of generation which could be tripped will be the availability of FCAS to manage the subsequent frequency disturbance.

It is suggested that the 100MW threshold could be replaced with the size of the largest generation unit currently in the region. Alternative this threshold could be increased to 144MW, being the largest machine in the Tasmanian region.

Increasing this threshold will not compromise system security and reliability while increasing the potential to reduce the cost of connecting wind generation to electrically remote sections of the network by allowing greater flexibility in turbine selection, and/or reduced requirements for auxiliary reactive equipment.

## Appendix D

The provisions for control of reactive power output can be enhanced to give better integration of wind farm reactive capability into overall system voltage control, potentially at lower cost.

### Reference in Draft Rule - Clause S5.2.5.13

Clause S5.2.5.13 (3)(i) creates a requirement for generating systems to have the capability to regulate voltage. In some circumstances, there is potential to achieve superior voltage co-ordination outcomes through regulation of reactive power if regulation of reactive power output is managed on basis of system variables other than voltage.

Consider the situation where a large number of remotely connected generating units can act to increase or decrease reactive losses on a 'stringy' network as a result of changing levels of generation. In this case, control of reactive power output based on real power flow through a given cut set can be very effective in managing voltage profile, while avoiding the timing and stability problems associated in co-ordinating voltage control over a large number of units.

For this reason, we suggest that clause S5.2.5.13 (3)(i) be reworded as follows:-

- (i) where the connection point nominal voltage is 100kV or more, to regulate voltage or reactive power in a manner that does not prevent the Network Service Provider from achieving the requirements of clauses S5.1a.3 and S5.1a.4.

## Appendix E

**System and plant standards in Australia should be harmonised with international standards to the extent practical.**

### **AEMC Views on submissions relating to Clause 4.1.11**

It is noted that, in general, the submissions by stakeholders relating to Clause 4.1.11 emphasised the need to keep the requirements for performance of equipment in accordance with Australian and International Standards.

In the Draft Rule Determination, the AEMC view on these submissions was stated (on page 46): "The Commission considers that the Australian and international standards are guidelines and that the Rules may set the relevant NEM standard including where this over-rides those standards."

In regard to wind turbine generators, if the requirements for performance in relation to temporary low voltage and temporary over voltage, exceed the requirements of the worlds major markets (the US and Germany in particular), then complex and expensive auxiliary equipment (that is often unwarranted), is required to meet the standards. If the frequency excursion ride-through requirements are not in accordance with common market practice, no auxiliary equipment can fix the issue.

In general, creating specific requirements outside the international market best practice for the Australian market restricts the product offering and increases costs. All effort should be made to keep performance requirements within the capabilities of at least four of the worlds top six wind turbine manufacturers. At present, this is not the case. The small, low margin Australian market will not justify the cost to the major wind turbine manufacturers of producing highly customised equipment. The costs would include the design, implementation, prototype testing, and often re-certification of a wind turbine model specifically for the Australian market. This effort would be reflected in the cost of the turbines and these costs are likely to be prohibitive in a small market like Australia.

### **Suggested resolution**

The suggested solution is to keep the NER requirements for equipment performance close to the International Standards of the countries that have the market power to dictate the performance required to the manufacturers.

This could be achieved by an overarching requirement in The Rules to align plant standards with international norms where at all practical.



## Appendix F

Review of the system standard for over voltage disturbance has potential to reduce the cost of connecting new generation without any reduction in system security or reliability.

### Reference in Draft Rule - Clause S5.1a.4

It is noted that the automatic access standard refers to Clause S5.1a.4 which describes the temporary high voltage profile allowable under the system standard. Recent analysis by consultants engaged by Roaring 40s have shown the actual high voltage profiles resulting from single contingency events in the NEM are well within this Standard. Further, there are only limited locations in the NEM where specific events will cause substantive high voltage excursions.

These factors suggest there is potential to further review Clause S5.1a.4 with a view to tightening the system standard and reducing the cost of integrating new generation into the NEM. It is worth noting that Roaring 40s recent experience is that the cost of additional reactive plant to achieve ride through of voltages allowable under Clause S5.1a.4 is around 4% of total wind farm capital cost.