Vestas Australian Wind Technology Pty Ltd

16 September 2011

Elizabeth Walters
Assistant Director, Electricity
Economic Regulation Authority
PO Box 8469
PERTH BC WA 6849

By email: publicsubmissions@erawa.com.au

Dear Ms Walters

Review of Western Power's Technical Rules

Vestas - Australian Wind Technology Pty Ltd (**Vestas**) wishes to make a brief submission to the Review of Western Power's Technical Rules referred to above.

Vestas is the world's leading supplier of wind power solutions, having installed more than 41,000 wind turbines across the globe. Worldwide, Vestas employs more than 23,000 people in the design, manufacture, sales, installation, operation and maintenance of wind turbines.

While the home country of Vestas is Denmark, we have significant operations all across the world and we are experienced in comparing policies and regulations in all our markets.

In Australia we have been responsible for the supply of more than half of the wind energy capacity to date, including the Collgar, Emu Downs and Alinta (Walkaway) wind farms in Western Australia.

Having reviewed the Technical Rules, Vestas takes the view that some of the amendments proposed do not adequately consider the technical capabilities of commercially available equipment nor the commercial impact the proposed amendments may have on future projects.

The Technical Rules specify quite onerous requirements such as the frequency ride through capability and temporary over-voltage and although an avenue exists to negotiate standards with the network service provider, such high upper performance limits will create uncertainty for both developers and manufacturers.

Vestas submits the following specific comments and questions in reference to the recommended changes to the clauses of the Technical Rules in the Review:

Clause 3.2.1 (a): Power Systems Performance Standards

We note that the transient overvoltage requirements as depicted in Figure 2.1 apply to the periphery of the transmission and distribution system. Although studies may be undertaken to determine the maximum potential overvoltage at the proposed connection point, there is no certainty within the proposed amendments that the findings of the study will mandate the upper level of the performance standards.

Clause 3.3.3.1(a): Reactive Power Capability

The new requirement of maintaining the reactive power capability to the full reactive power output required under clause 3.3.3.1 of all generating units and the power station in which the generating unit is located will impose additional project costs to allow for these operational conditions to be maintained at the maximum ambient temperatures as indicated in the figure included in clause 3.3.3.1 (a).

Many suppliers worldwide normally operate to a maximum ambient condition of 40° C. It is unclear how these new amendments will treat such equipment with such operating restrictions.

It is suggested that if equipment is not able to operate beyond 40° C then the potential MW output level of such equipment would reduce to zero which would then be less than the specified “Minimum MW” level. This in turn would mean that no reactive support would be required above the equipment’s maximum operating temperature.

Further clarity is requested on how equipment with maximum operating conditions will be treated under this clause or would an agreed restriction be required to be sort on each occasion under clause 3.1 (b). If so, this would create uncertainty for project developers and equipment manufacturers alike.

Clause 3.3.3.1(b): Reactive Power Capability

It is suggested that after the words “generating unit” the words “and/or generating system” should be added to reflect the common configuration of wind farms whereby multiple generating units are combined with a single controller that coordinates the reactive power variation at the connection point by distributing appropriate reactive power set points to the generating units.

In addition, we note that Clause 3.3.3.1 (b) states that mechanically switched devices (other than a transformer with an on-load tap changer) cannot be used as part of the reactive power capability. This implies that if the generating units require additional source of reactive power within the facility to meet the Technical Rules then cost effective reactive support options such as mechanically switched capacitor banks and the like would not be a compliant option.

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This appears to be out of step to the acceptability of such devices within other grid codes in other parts of the world, including the National Electricity Rules (NER). Mechanically switched equipment can create cost effective solutions in situations where other more sophisticated equipment functionality may not be required.

Clause 3.3.3.3(b): Immunity to Frequency Excursions

The concern raised here is again the requirement to operate up to an upper ambient temperature as depicted in the figure included under clause 3.3.3.1 (a). As stated above under the response to clause 3.3.3.1(a), many types of commercially available equipment may operate to a lesser maximum operating temperature or may have operating restrictions at extreme temperatures.

Again, applying such high upper technical performance requirements with the only avenue to lessen the requirement being the negotiation of operating restrictions with the network service provider creates uncertainty for both developers and manufacturers.

Clause 3.3.3.3(e): Immunity to High Speed Auto Reclosing

The figure is not clear as the curves are overlapping.

Clause 3.3.4.4(f)(2)

It is interesting to note that for dispatchable generating units of certain technologies such as thermal generating units and hydro generating units, the rate of response requirement has very generously considered the technical challenges these technologies face in regards to rate of response to frequencies changes (i.e allowing for a 6 second and 30 second response time).

However this same generosity seems to be missing when considering other types of generation. For example, wind turbine generators also face technical challenges to reduce power extremely quickly without increased wear and tear on their components, which has a detrimental effect on their design and operational life.

It is implied that generating units must be able to reduce active power (to support frequency disturbances) by up to 90% of their full nameplate rating within 2 seconds. Such a response rate creates unacceptably large mechanical loads on wind turbine generators which may mean that the only viable option would be to trip off the entire power plant. It is suggested that the rate of response be increased from 2 seconds to 10 seconds.

It should also be recognised that generating units with a variable energy source may not have the spinning reserve to support a frequency drop. There should be recognition of such restrictions for such technologies within the Technical Rules rather than a need to request for an agreed operating restriction with the network service provider.

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Attachment 4 Note 1: Large Generating Unit Design Data

It is not clear how the site specific maximum ambient temperature is defined. In addition, generating units may need to be derated at extremely high temperatures. Thus the data required in this attachment being required at the maximum ambient temperature may correlate to a derated operating condition which may not reflect the normal operating condition.

Next steps

We would be pleased to brief the ERA further on this topic and can be contacted on (03) 8698 7075.

Yours sincerely,

[signed]

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Serge Forza
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