



20 February 2009

Wind Generation Licensing - Draft Proposals
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Attn: Margaret Cross

Wind Generation Licensing - Draft Proposals

Roaring 40s welcomes the opportunity to contribute to the review of South Australian wind generation licensing conditions (ESCOSA licensing principles). The rate of wind generation roll out in South Australia, combined with the small size and geographic spread of the electricity transmission system creates unique technical and economic challenges. Roaring 40s acknowledges the effectiveness of ESCOSA licensing principles to date in ensuring orderly deployment of wind generation in South Australia.

There have been a number of significant developments since the existing licensing principles were established in 2005, most importantly:

- Extension of the Renewable Energy Target (RET) has increased certainty that large amounts of wind generation will be developed in South Australia in the short to medium term;
- The NER technical standards arrangements have been comprehensively overhauled in the "National Electricity Amendment (Technical Standards for Wind Generation and other Generator Connections) Rule 2007 No.2"; and
- Wind Developers, Electranet and NEMMCO have gained greater understanding of technical issues that arise under high wind penetration through detailed assessment of specific projects.

Roaring 40s supports the removal of license provisions that have been made redundant by national arrangements together with retention of South Australian regulation where residual issues remain. Roaring 40s suggests that the following principles need to be applied to ensure the residual arrangements are in line with good regulatory practice:

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1. Principle 1: South Australian regulation should seek to address clearly identified South Australia-specific issues in a manner that minimises the divergence from national arrangements;
2. Principle 2: Design of South Australian regulation should progress the National Electricity Objective (NEO); and
3. Principle 3: Arrangements need to be equitable, efficient and independent of size and technology.

Regarding Principle 3, Roaring 40s notes that expansion of the RET is likely to result in saturation of the South Australian transmission system with large scale wind farms and subsequent development of lower grade wind resources in other states. This outcome has potential to drive exploitation of South Australia's superior wind resource by small to medium scale embedded wind generation with a resultant impact on the South Australian electricity system. Roaring 40s suggests that ESCOSA review the arrangements for smaller generators to proactively facilitate efficient and equitable arrangements for this class of generation - while reducing the potential of unintended consequences.

Of the technical issues currently managed by license conditions in South Australia, Roaring 40s is of the view that fault ride through and reactive power control are the only issues that require ongoing management through ESCOSA licensing arrangements. Justification for divergence from national arrangements for these specific issues (in accordance with the principles outlined above) is as follows:

- The rate of wind farm deployment in South Australia, combined with the small size and geographic spread of the electricity transmission system creates unique technical, economic and regulatory challenges. Roaring 40s has extensive experience in connecting leading edge wind turbine technologies which includes doubly fed induction machines (both crowbar and "AGO"), full converter induction machines, induction machines, full converter permanent magnet machines and full converter synchronous machines. Each of these technologies has specific grid connection considerations and challenges. Roaring 40s acknowledges that management of emerging technical issues specific to the South Australian grid will continue to challenge industry over the next few years.
- While industry works hard to come to grips with these issues, Roaring 40s believes it is prudent to apply a degree of conservatism in the areas of fault ride through and reactive power control. It must be made clear that this view does not in any way suggest there is a deficiency in the national arrangements. Rather, it recognises that application of the national arrangements will be tested to the full in South Australia over the next few years, justifying additional conservatism in the immediate future.

In formulating the ongoing jurisdiction requirements for reactive power, Roaring 40s notes that the current licensing arrangements are resulting in installation of expensive dynamic reactive plant at South Australian wind farms. Typically this represents a cost premium of 3-4% to these projects. For role out of 500MW of wind generation in South Australia, this represents a cost of around \$40M.

Given the magnitude of this cost (which is of course reflected in prices seen by end use customers), it is suggested that ESCOSA examine the potential for reducing the requirement for dynamic reactive power. The potential for reducing this cost by installing dynamic reactive power control at strategic load substations should also be considered.

Detailed response to the consultation paper is provided in the attached Appendix together with consideration of congestion and licensing issues specific to the South Australian market. Roaring 40s urges ESCOSA to consider these issues as significant matters for wind developers operating in South Australia.

Due to the complex nature of the issues at hand, Roaring 40s would welcome the opportunity to discuss the matters raised in this submission in person at the appropriate time. Please do not hesitate to contact Andrew Jones (Manager Market and Regulation) on 0400 537 944 if we can assist with any of the above.

Yours Sincerely



John Titchen,
General Manager Business Development

Appendix

1. Registration as Semi-scheduled generators

Roaring 40s supports this proposal. However it is noted that any future move to review the non-scheduled status of pre-2005 licensees would be considered a matter of serious sovereign risk. Investors committing to a high value, long life infrastructure project such as wind farms do so with the reasonable expectation that they would be immune from retrospective changes to network access arrangements.

The proposed licensing conditions require generators greater than 30MW to register as semi-scheduled and as such be available to NEMMCO in managing congestion on the transmission network. Conversely, generators less than 30MW are not required to be registered as semi-scheduled and are not required to be constrainable for network congestion management.

Looking forward, the rising price of wind generation and emerging constraints on the transmission network has good potential to make development of sub 30MW wind farms in South Australia very attractive in the short to medium future.

The 30MW threshold has potential to create a two tier network access regime, with sub 30MW plant gaining preferential access to scarce network capacity. This creates an inefficient and inequitable regime where smaller generators are isolated from the economic signals arising from network congestion. It is envisaged this could result in difficulty in managing power system security and substantial economic harm in the medium term as smaller generators strand existing larger generators by crowding congested parts of the network.

Roaring 40s suggests that ESCOSA needs to move proactively on this issue and lower the 30MW threshold for registration as semi-dispatch to 5MW as an immediate response. In the longer term we suggest that ESCOSA investigate lowering this threshold further in conjunction with streamlining of semi-dispatch or similar arrangements to minimise the transaction costs of small generators participating in semi-dispatch.

2. Registration as market generators

Roaring 40s supports this proposal.

Looking forward, the rising price of wind generation and emerging constraints on the transmission network has good potential to make development of sub 30MW wind farms in South Australia attractive in the short to medium future. Roaring 40s recommend that ESCOSA review the 30MW threshold downward to ensure these smaller wind farms face efficient ancillary service pricing signals.

3. Wind forecasting

These changes will confirm the wind forecasting arrangements for South Australian wind farms as being aligned with arrangements for wind farms elsewhere in the NEM. Roaring 40s supports this rationalisation of wind forecasting arrangements.

Looking forward, the rising price of wind generation and emerging constraints on the transmission network has good potential to make development of small wind farms in South Australia very attractive in the short to medium future. Roaring 40s recommend that ESCOSA investigate whether new measures will be required to manage a large number of individual wind installations less than 5MW in the medium to long term.

4. Ancillary services

These changes will confirm alignment of the ancillary services arrangements for South Australian wind farms with the rest of the NEM. Roaring 40s supports this rationalisation of ancillary service arrangements.

5. Technical Standards

The current ESCOSA licensing principles require wind farms in South Australia to be capable of a high level of fault ride through performance. Similarly, reactive plant requirements are at the high end of standards applicable in the rest of the NEM. These arrangements were put in place to minimise the potential for unanticipated power system security problems once very high levels of wind penetration are achieved in South Australia.

These arrangements do increase the cost of building wind farms in South Australia in the order of 3-4%, primarily due to the need to install statcoms to meet dynamic reactive power requirements.

Roaring 40s' experiences with Cathedral Rocks, Studland Bay and Musselroe wind farms have highlighted the difficulty in detecting and managing serious issues that can emerge when connecting wind farms to thin grids. The level of wind penetration forecast for South Australia combined with the thin grid and geographical diversity of wind farms will create a power system with substantially different characteristics to others in the world. In this environment, ESCOSA's approach of somewhat conservative standard setting is considered appropriate.

Looking forward, scarcity of high grade wind resource and emergence of material constraints on the transmission network has good potential to make development of small wind farms in South Australia attractive in the short to medium future.

Roaring 40s understands that in recent times Denmark has experienced substantial sympathetic shedding of distributed (non-fault ride through capable) wind generation in response to a fault on a large generating unit

causing unacceptable levels of system disturbance. It would appear that there is potential for this situation to arise in South Australian in the medium to long term. Roaring 40s suggests that ESCOSA engage on this issue in a proactive manner and develop mandatory fault ride through requirements for all larger wind turbine units connecting to the South Australian.

Roaring 40s suggests that wind turbine units bigger than 500kW would be required to have the capacity to ride through faults on the adjacent transmission system. Wind turbine generating units above this size are typically designed with connection to transmission grids with fault ride through capability available as an option.

6. Network Congestion

Roaring 40s notes that network congestion is emerging as major issue for wind farm projects on the South Australian transmission system. Roaring 40s acknowledges the common carriage nature of the NEM transmission access regime, and that congestion is likely to arise in the course of efficient development of the power system.

Inter-regional congestion is not having a major impact on the NEM at this point in time, however it is anticipated that substantial congestion will arise in the South Australian network over the short to medium term as a result of the rapid deployment of large scale wind farms.

Roaring 40s is gravely concerned that developers connecting to the South Australian system struggle to inform themselves of congestion risk as a result of limited computational techniques and poor access to power system data. This has potential to cause substantial economic harm in that poorly informed developers may unknowingly connect to congested parts of the network, so stranding their own investment and existing investments of others.

Roaring 40s suggests that ESCOSA give consideration to mandating provision of a congestion analysis report at time of license application to ensure connecting parties have informed themselves adequately of this risk. This would substantially mitigate the risk of a market failure due to insufficiently informed market participants.

7. Issuing of generation licenses

It is understood that completion of Electranet connection studies are currently required by ESCOSA as evidence of ability to comply with generation license conditions. Due to the level of detail and time required to complete connection studies, this requirement can result in substantial delays in gaining a generation license which impacts on project financing and easement acquisition.

Roaring 40s acknowledges that completed connection studies are an appropriate means by which compliance with the license conditions can be

confirmed. It is suggested however, that it would be more efficient to issue generation licenses pending completion of system studies. Enforcement of compliance with the licensing conditions would then be achieved by prohibiting connection or operation of the plant until ESCOSA/ESIPC had reviewed connection studies and confirmed compliance with the license.

