Electricity

Variation to clause 2.4.1 of the Electricity Transmission Code

FINAL DECISION

October 2015

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Glossary of terms

AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
Code	Electricity Transmission Code
Commission	Essential Services Commission of South Australia
ElectraNet	ElectraNet SA Pty Ltd
ESAA	Energy Supply Association of Australia
kV	Kilo Volt
MW	Mega Watt
MWh	Mega Watt hour
NER	National Electricity Rules
Option 1	The option proposed by ElectraNet to give effect to upgraded reliability performance at the Baroota exit point by augmentation of existing assets
Option 2	The option proposed by ElectraNet to give effect to upgraded reliability performance at the Baroota exit point by replacement of existing assets
Option 3	The option proposed by ElectraNet to give effect to upgraded reliability performance at the Baroota exit point using third party generation support
PADR	Project Assessment Draft Report
RIT-T	Regulatory Investment Test - Transmission
SACOSS	South Australian Council for Social Service
SAPN	SA Power Networks
TNSP	Transmission Network Service Provider
VCR	Value of Customer Reliability
2011 Analysis	The analysis that underpinned the 2011 Code variation to upgrade the exit point reliability standard categorisation for the Baroota exit point

1 Executive summary

Under the provisions of the *National Electricity (South Australia) Act 1996* and the associated National Electricity Rules (NER), the Essential Services Commission of South Australia (Commission) has a jurisdictional role in determining the reliability standards for electricity transmission services. The standards are set out in the Electricity Transmission Code (Code).

The key transmission network service provider (TNSP) to which the Code applies is ElectraNet SA Pty Ltd (ElectraNet). However, various elements of the Code also apply to Murraylink Transmission Company Pty Ltd, SA Power Networks (SAPN) and other transmission entities licenced by the Commission.

The transmission reliability standards set out in chapter 2 of the Code impact on the costs incurred by ElectraNet in operating and maintaining its transmission network. Those costs are taken into account by the Australian Energy Regulator (AER) in determining the revenues that ElectraNet can recover from customers in operating the network.

The reliability standards that apply to transmission "exit points" (points where the transmission network feeds into the SAPN distribution network or to customers directly connected to the transmission network) were reviewed and re-set by the Commission in 2011, ahead of the AER's revenue reset process for ElectraNet for the period from 2013 to 2018. The Commission, in its Final Decision, determined that two exit points, Dalrymple and Baroota, should be upgraded from Category 1 to Category 2 (thereby requiring an augmentation of exit point infrastructure) by 1 December 2016 and 1 December 2017 respectively, to meet the future electricity demand at those exit points, as forecast at that time.

Under the NER, prior to undertaking any augmentation of an exit point, a regulatory investment test for transmission (RIT-T) must be undertaken by the TNSP.

ElectraNet completed the RIT-T for the Dalrymple exit point upgrade in November 2013 and has commenced the upgrade work on Dalrymple albeit under a reduced scope.

ElectraNet recently completed the RIT-T for Baroota, and has identified that, under the latest forecasts and assumptions, there is no longer an economic justification for upgrading that exit point.

The Commission considered that analysis and released a discussion paper in August 2015.[1] Through that paper the Commission sought feedback to the proposal to vary the Code by removing the requirement for the Baroota exit point upgrade. The Commission received three submissions in relation to discussion paper, all of which supported the proposed Code variation.

The Commission agrees that there is no economic justification for the upgrade. If the upgrade were to occur, the cost would outweigh the associated benefits of improved reliability and would be borne by all electricity customers in South Australia.

Consequently, for the reasons set out in this final decision, the Commission has varied the Code to remove the requirement for ElectraNet to upgrade the Baroota exit point. This variation will have effect on and from the date notification is published in the South Australian Government Gazette, following which a copy of the Code as varied will be available on the Commission's website.

[1] **Essential Services Commission, *Proposed amendment to the Electricity Transmission Code discussion paper*, August 2015, available at: http://www.escosa.sa.gov.au/library/20150814-Electricity-ProposedAmendmentTransmissionCode-DiscussionPaper.pdf**

2 The Electricity Transmission Code

The Code was established in October 1999 as a part of the electricity reform process in South Australia. The Code is an industry code, made and administered by the Commission pursuant to Part 4 of the *Essential Services Commission Act 2002*. Compliance with the Code is a mandatory condition of a transmission entity's licence by reason of the operation of section 21(1)(a) of the *Electricity Act 1996*.

2.1 Purpose of the Code

The Code sets various service standards with which TNSPs must comply, prescribing standards in relation to matters such as network planning, interruptions, design requirements, technical requirements, access to sites and land, access for telecommunication purposes and, relevant to the purposes of this proposed amendment, transmission exit point reliability standards.

2.2 Transmission exit point reliability standards

Of note, while the Code applies broadly as described above, the transmission exit point reliability standards regime applies only to ElectraNet. Clause 2.4 of the Code allocates each exit point (or group of exit points) from the ElectraNet network to one of five defined reliability categories (Category 1 to Category 5) as defined in clauses 2.5 to 2.9 of the Code.

For each category, the Code requires ElectraNet to attain the specified level of reliability and supply restoration standards in terms of line capacity and transformer capacity. ElectraNet must therefore plan, develop and maintain its transmission system such that the specified standards are met in relation to each connection point or group of connection points.

The standards specified are expressed in terms of degrees of redundancy, being 'N', 'N-1' and 'N-2'.

'N' reliability means that the transmission system is able to supply the maximum demand, provided that all the network elements are in service. The loss of a single transmission element (a line or a transformer) would cause a supply interruption to some customers.

'N-1' reliability provides a higher level of reliability. It means that supply would be maintained if one network element was out of service. It is also possible to define 'N–1' reliability for a percentage of the time or for a percentage of the maximum demand.

There are no exit points in the state with an 'N–2' reliability standard.

The transmission exit point reliability standards initially incorporated into the Code in 1999 were equivalent to the actual reliability standards that prevailed in the 12 months prior to October 1999. This was to ensure that transmission customers would not experience a reduction in reliability performance as a result of the electricity reform process.

3 The Baroota exit point

The Baroota exit point forms part of the Mid-North network and is located approximately 25km north of Port Pirie. Baroota is connected via the 132 kilo volt (kV) network. The Mid-North network provides electricity to a range of industries including agriculture, manufacturing and commercial.

The current Baroota exit point is classified as a Category 1 reliability standard ('N' line and 'N' transformer capability), consisting of one 10 MVA 132/33 kV transformer with electricity supplied from a single transmission line.

In the 2005-06 Code review, the Baroota exit point maintained its classification as Category 1. At the time, the average demand was forecast to increase but not at a sufficient rate to warrant an upgrade in exit point reliability during the next regulatory period (2008–2013).

In 2011, the time of the most recent Code review, forecast average demand was projected to increase at the Baroota exit point. As part of that review, the Australian Energy Market Operator (AEMO) undertook a cost-benefit analysis for an upgrade of the Baroota exit point that was based on the assumptions at the time, which included an increase in forecast average demand and an increase in the ascribed value of customer reliability (VCR). The analysis indicated that an upgrade of the exit point was economically justifiable, as the value to customers of the improved reliability was expected to be greater than the cost of the upgrade.

Supported by AEMO's analysis, the Commission amended the reliability standard of the Baroota exit point to Category 2, with effect from 1 December 2017 (being the point at which it was estimated the economic benefits would exceed the costs to upgrade).

Under the increased reliability standard, from December 2017 the transformer capacity is required to meet an "N-1" level of redundancy.

3.1 Review of the need for an upgrade

To address the change in reliability standard, ElectraNet and SA Power Networks prepared a Project Assessment Draft Report (PADR)[2] for public consultation in June 2015, in accordance with clause 5.16.4 of the NER.

An economic analysis of the reliability standard applying to Baroota was undertaken using the most current demand impacts and VCR inputs (both of which have reduced markedly since the last review).

The PADR demonstrated that, under those updated inputs, none of the upgrade options considered by ElectraNet and SAPN are economically justified.

On this basis, ElectraNet submitted a proposal to the Commission to amend the classification of the Baroota exit point such that it will remain at Category 1.

[2] **ElectraNet, *Baroota substation upgrade Project Assessment Draft Report*, June 2015, available at: http://www.electranet.com.au/assets/RIT-T/Baroota-substation-upgrade/Baroota-substation-upgrade-project-Project-Assessment-Draft-Report.pdf**

3.2 Review of analysis

ElectraNet has provided the Commission with the economic modelling it undertook on the options outlined in its PADR.

The key differences between the current analysis and the analysis that underpinned the decision to upgrade the Baroota exit point from Category 1 to Category 2 (2011 Analysis) are:

Demand forecasts:

- The peak demand forecasts (as provided by SAPN) are lower than those used in the 2011 Analysis by an average of 2.3 megawatts (MW) or 22 per cent.

Assumed benefits:

- The assumed VCR (the metric that underpins the quantification of the benefits associated with improved reliability) was re-assessed by AEMO in 2014 at $34,396 per megawatt-hour (MWh). The 2014 study was based on a survey of almost 3,000 diverse customers across the National Electricity Market. The revised estimated VCR was based on an assessment of the energy mix between load categories at Baroota, and represented a reduction of approximately 25 per cent from the $45,767 per MWh used in the 2011 Analysis.
- The 2011 Analysis assumed that transmission transformers failures occur in peak demand periods. Failure analysis provided by AEMO and an independent transformer expert report commissioned by ElectraNet shows that these outages can occur at any time, rather than only at times of maximum demand. As a result, the assumed load factor for the transformer is reduced from 1.00 to 0.49 for the current analysis. This reduces the benefits associated with the upgrade by approximately one half.
- The current analysis includes post-contingent support by SAPN of 4.8 MW, which can be provided by the distribution network, thereby reducing the impact of an outage (and therefore, the benefit of improved reliability).

Assumed costs:

- As set out in the PADR, ElectraNet has considered three options that each provide the requisite Category 2 reliability standard at the Baroota exit point from 1 December 2017:
  - Rebuild the Baroota exit point utilising the existing plant & equipment wherever possible (Option 1);
  - Augment the Baroota exit point (Option 2); and
  - Retain the existing Baroota exit point but provide additional non-network support via a third party generator (Option 3).
- Option 2 is the approach that most closely reflects the 2011 Analysis. The capital costs associated with Option 2 are $18.4m. Operating costs are assumed to be 2 per cent of the capital costs (or $0.4m) per year. This compares to a capital cost of $22.0m and annual operating costs of $0.4m in the 2011 Analysis.
- Under Option 1, the capital cost is significantly lower, at $6.0m. Operating costs are $0.1m per year.
- The third party costs in relation to Option 3 were not provided in sufficient detail to separate capital costs and operating costs. The capital and operating costs of the third party provider were estimated to have a combined net present value of $4.6m. In addition, the estimated capital costs incurred directly by ElectraNet are assumed to be $2.5m, with annual operating costs of $0.05m. This information is sufficient to enable the cost-benefit analysis to be performed.

The net market benefit derived by ElectraNet for each of the options is summarised below:

Net market benefit (July-2015 $m)

OPTION	DESCRIPTION	COST	BENEFIT	NET MARKET BENEFIT
1	Augment	5.27	4.40	(0.87)
2	Rebuild	16.21	4.40	(11.81)
3	Third party generation	6.80	4.50	(2.30)

The Commission has reviewed ElectraNet's cost-benefit analysis and discussed the basis of the revised assumptions with ElectraNet. While none of the issues raised by the Commission had a material impact on the outcome of the analysis, the Commission notes that, in performing its analysis, ElectraNet applied the discount rates recommended by GridAustralia in July 2011, and specifically a central assumption discount rate of 10 per cent (real, pre-tax).

Consistent with the AER guidelines, this rate is intended to approximate the commercial discount rate appropriate for the analysis of a private enterprise investment in the electricity sector. The Commission notes that, in the current economic climate, an appropriate commercial discount rate may be below that applied by ElectraNet, and that AEMO has adopted a discount rate of 7.5 per cent (real, pre-tax) in its latest economic analyses.

However, the Commission also notes that the discount rate could decrease to below 7.5 per cent without changing the outcome of the analysis.

The Commission therefore agrees with ElectraNet's conclusion that none of the three options considered by ElectraNet provides a net economic benefit to consumers. If the Baroota reliability standard does not revert to Category 1 (as proposed), ElectraNet will be required to upgrade it (under the least cost option) and the cost of that upgrade would be borne by all consumers. The analysis demonstrates that the cost to consumers of the upgrade outweighs the benefits of the improved reliability under current estimates. It is not in the long-term interests of electricity consumers for that to occur.

The Commission has reached this finding having regard to submissions made by stakeholders during public consultation on this review. In particular, following its release of the discussion paper in August 2015, the Commission received submissions from the following stakeholders:

- The Energy Supply Association of Australia (ESAA)[3]
- Business SA[4]
- The South Australian Council of Social Service (SACOSS)[5]

All three stakeholders expressed their broad support for the proposal to re-categorise the Baroota exit point reliability category to Category 1.

[3] **ESAA, *Submission to discussion paper*, September 2015, available at: http://www.escosa.sa.gov.au/library/150914-Electricity-ProposedVariation-TransmissionCodeDiscussionPaperSubmission-ESAA.pdf**

[4] **Business SA, *Submission to discussion paper*, September 2015, available at: http://www.escosa.sa.gov.au/library/150914-Electricity-ProposedVariation-TransmissionCodeDiscussionPaperSubmission-BusinessSA.pdf**

[5] **SACOSS, *Submission to discussion paper*, September 2015, available at: http://www.escosa.sa.gov.au/library/150914-Electricity-ProposedVariation-TransmissionCodeDiscussionPaperSubmission-SACOSS.pdf**

Specifically, Business SA considered the proposal not to require the Baroota exit point to be upgraded is prudent in light of falling electricity demand, and SACOSS welcomed any decision that would shield consumers from the costs of unnecessary infrastructure investment. Furthermore, the ESAA stated its support for flexible planning arrangements such as those that have led to this variation.

4 The final decision

On the basis that it is no longer considered to be economically viable to require the Baroota exit point to be upgraded from Category 1 to Category 2 on and from 1 December 2017, the Commission has amended the Code to reclassify the Baroota exit point to Category 1, by:

1. Removing the phrase "Baroota (on and from 1 December 2017)" from the Category 2 exit point as set out in the table in clause 2.4.1 of the Code; and

2. Removing the phrase "(until 1 December 2017)" from the Category 1 exit point reference to Baroota as set out in the table in clause 2.4.1 of the Code.

This variation will have effect on and from the date notification is published in the South Australian Government Gazette, following which a copy of the Code as varied will be available on the Commission's website.

5 Next steps

The release of this final decision marks the final step in the variation of clause 2.4.1 of the Electricity Transmission Code. The Commission has recently commenced its periodic review of the Electricity Transmission Code with the publication of an issues paper earlier in October 2015.[6] The Commission looks forward to receiving submissions from stakeholders in relation to its review prior to issuing a draft decision in January 2016.

[6] http://www.escosa.sa.gov.au/library/20151001-Electricity-TransmissionCodeReview-IssuesPaper.pdf


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