



## PROPOSED VARIATION TO CLAUSE 2.4.1 OF THE ELECTRICITY TRANSMISSION CODE

*Discussion Paper*

August 2015



## REQUEST FOR SUBMISSIONS

The Essential Services Commission of SA (**the Commission**) invites written submissions from members of the community on this paper. Written comments should be provided by **Friday, 11 September 2015**.

It is the Commission's policy to make all submissions publicly available via its website ([www.escosa.sa.gov.au](http://www.escosa.sa.gov.au)), except where a submission either wholly or partly contains confidential or commercially sensitive information provided on a confidential basis and appropriate prior notice has been given.

The Commission may also exercise its discretion not to publish any submission based on length or content (for example containing material that is defamatory, offensive or in breach of any law).

Responses to this paper should be directed to:

**Proposed variation to clause 2.4.1 of the Electricity Transmission Code**

It is preferred that submissions are sent electronically to:

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The Essential Services Commission of South Australia is an independent statutory authority with functions in a range of essential services including water, sewerage, electricity, gas, rail and maritime services, and also has a general advisory function on economic matters.  
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**This discussion paper proposes an amendment to the Electricity Transmission Code to remove the requirement for the Baroota exit point to be upgraded from a Category 1 reliability standard to a Category 2 reliability standard on and from 1 December 2017.**

## INTRODUCTION

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 (the **Commission**) has a jurisdictional role in determining the reliability standards for electricity transmission services. The standards are set out in the Electricity Transmission Code (**ETC**).

The key entity to which the ETC applies is ElectraNet SA Pty Ltd (**ElectraNet**). However, various elements of the ETC also apply to Murraylink Transmission Company Pty Ltd and to SA Power Networks (**SAPN**).

The transmission reliability standards impact on the costs incurred by ElectraNet in operating and maintaining its transmission network and those costs are taken into account by the Australian Energy Regulator (**AER**) in determining the revenues that ElectraNet can recover.

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.<sup>1</sup> The Commission, in its Final Decision<sup>2</sup>, determined that two exit points, Dalrymple and Baroota, should be upgraded 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 transmission network service provider (**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 has 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 the Baroota exit point.

This discussion paper proposes an amendment to the ETC to remove the requirement for ElectraNet to upgrade the Baroota exit point, as the Commission agrees that there is no economic justification for the upgrade. If the upgrade were to occur, the cost would be borne by all electricity customers in South Australia and those costs would outweigh the associated benefits of improved reliability.

## THE ELECTRICITY TRANSMISSION CODE

The ETC was established in October 1999 as a part of the electricity reform process in South Australia. The ETC is an industry code, made and administered by the Commission pursuant to Part 4 of the *Essential Services Commission Act 2002*. Compliance with the ETC 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*.

### Purpose of the ETC

The purpose of the ETC is to set various service standards with which TNSPs must comply.

The ETC prescribes 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

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<sup>1</sup> The exit point standards are shortly to be reviewed again by the Commission in anticipation of the subsequent AER process for the regulatory period 2018-2023

<sup>2</sup> Review of the ETC  
<http://www.escosa.sa.gov.au/library/120217-ReviewElectricityTransmission-FinalDecision.pdf>

purposes of this proposed amendment, transmission exit point reliability standards.

#### *Transmission exit point reliability standards*

Of note, while the ETC applies broadly as described above, the transmission exit point reliability standards regime applies only to ElectraNet. The transmission exit point reliability standards are contained in clauses 2.5 to 2.9 of the ETC.

These clauses allocate each exit point (or group of exit points) from the ElectraNet network to one of five defined reliability categories (Category 1 to Category 5).

For each category, the ETC 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 ETC 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.

## 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 132,000 volt 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<sup>3</sup> 132/33 kV transformer with electricity supplied from a single transmission line.

In the 2005-06 ETC 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 ETC 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.

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<sup>3</sup> Mega volt ampere

## The issue

### RIT-T undertaken

To address the change in reliability standard, a Project Assessment Draft Report<sup>4</sup> (**PADR**) was prepared for public consultation in June 2015 by ElectraNet and SA Power Networks, 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<sup>5</sup>).

The PADR demonstrates 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.

### 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 (the **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.
- ▲ 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 any outages.

#### 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<sup>6</sup> 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.

#### 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 1 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.

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<sup>4</sup> *Baroota Substation Upgrade, RIT-T: Project Assessment Draft Report, June 2015*, ElectraNet and SA Power Networks

<sup>5</sup> Details on demand and VCR can be found on AEMO's website: [www.aemo.com.au](http://www.aemo.com.au)

<sup>6</sup> AEMO, *Value of Customer Reliability Review Final Report*, September 2014:

- ▲ 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<sup>7</sup>, and specifically a central assumption discount rate of 10% (real, pre-tax).

Consistent with the AER guidelines<sup>8</sup>, 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% (real, pre-tax) in its latest economic analyses.<sup>9</sup>

However, the Commission also notes that the discount rate could decrease to below 7.5% 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 proposed solution*

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 proposes to amend the ETC to reclassify the Baroota exit point to Category 1. To give effect to this amendment, the Commission proposes to:

1. Remove 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 ETC; and
2. Remove 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 ETC.

<sup>7</sup> Grid Australia, *RIT-T Cost Benefit Analysis, Grid Australia Handbook*, July 2011

<sup>8</sup> AER, *Final Regulatory investment test for transmission*, June 2010

<sup>9</sup> AEMO, *Review of the South Australian Electricity Transmission Code Reliability Standards*, May 2015

## NEXT STEPS

As is the case with any variation proposed for an industry code made by the Commission under the authority of the *Essential Services Commission Act 2002*, the Commission is seeking stakeholder views on the proposal set out in this paper on or before the close of business on **Friday, 11 September 2015**. Information on the manner in which submissions may be made is set out on the inside cover of this paper.

Following the receipt of submissions, the Commission will further consider this matter and make a Final Decision in late October 2015. If the outcome of those further considerations is a decision to give effect to the amendment as proposed (or a variant of that proposal), the Commission would make that amendment effective from the date of release of the Final Decision.

## TIMETABLE FOR THIS REVIEW

The Commission will release its Final Determination in October 2015.

| STAGE                        | TIMING                       |
|------------------------------|------------------------------|
| Discussion paper released    | August 2015                  |
| Public Consultation          | August 2015 – September 2015 |
| Final Determination released | October 2015                 |
| Applies from                 | October 2015                 |

## FURTHER INFORMATION

Any queries relating to this consultation should be directed to:

- ▲ Stephen Pearce – Manager, Economics

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