ElectraNet Transmission Network Revenue Proposal

Appendix R – Proposed Contingent Projects

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1. Eyre Peninsula Connection Point

1.1 Background

The load in the Eyre Peninsula region is primarily related to small scale mining, residential and commercial activities, with seasonal primary industry activity (grain handling). State government mineral resources forecasts indicate that the balance of loading on the Eyre Peninsula will move towards large scale mining activities, dominated by iron ore extraction and handling over the next 5-10 years.

The recent Resources and Energy Infrastructure Demand Study published by the Resources and Energy Infrastructure Council (RESIC) highlighted the positive economic outlook in the longer term and prospect of significant new mining loads requiring connection to the transmission network[1].

The existing network infrastructure in the area consists of a double circuit 275 kV line from Davenport to Cultana and two single circuit 132 kV lines from Cultana to Whyalla 132 kV substation. In addition, radial 132 kV circuits lead from Cultana to Stony Point and from Cultana to Yadnarie and then to Port Lincoln 132 kV substations. A further 132 kV radial line runs west from Yadnarie to Wudinna 132 kV substation.

The underlying distribution network consists of a mixture of 66 kV and 33 kV sub-transmission lines on the Peninsula that radiate from and are fed from the Whyalla, Stony Point, Yadnarie, Wudinna and Port Lincoln 132 kV substations.

Located at Port Lincoln is a diesel fired gas turbine power station contracted to provide network support to the transmission network with three units (two located on the 132 kV bus and one located on the 33 kV bus) with a nominal rating of 25 MW and a maximum contracted summer output of 49 MW.

1.2 Project description

Establishment of a nodal substation south of Cultana.

ElectraNet considers that the project should be accepted as a contingent project for the regulatory period because of uncertainty about the trigger event occurring and the scope and costs of the project.

1.3 Trigger event

- Customer commitment to connect OR an increase of 5 MW in load forecast above the forecast published in the 2011 APR for 2018-19 on the transmission network south of Cultana; and
- A successful completion of the RIT-T showing a new connection point in the region is justified.

[1] *Resources and Energy Infrastructure Demand Study*, Resources and Energy Infrastructure Council (RESIC), November 2011

This trigger event is specific and capable of objective verification, relates to a specific location, and is probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

1.4 Project requirement

Chapter 5 of the Rules requires a TNSP to make an offer of connection to a customer, on application. The ETC requires ElectraNet to submit the applicable standards for a new connection point to ESCOSA for approval. New transmission assets are established in accordance with the definitions of prescribed, negotiated and non-regulated transmission services established under the Rules. The manner in which ElectraNet applies these definitions is outlined in the Grid Australia Categorisation of Transmission Services Guideline[2] with reference to the minimum service requirements of the ETC. The scope of this project is limited to the prescribed transmission assets established in accordance with these requirements.

With no other 275/132 kV transformation to the south, the Cultana transformers would become overloaded under single contingencies with relatively minor increases in maximum demand. While the rate of load growth on the Peninsula has been modest in recent years, only a small step change is required to cause the overload of the remaining 275/132 kV transformer at Cultana (notwithstanding the use of cyclic overload ratings) and bring forward the need for reinforcement by a number of years.

The potential need for this project has been identified in a distribution planning study recommending that additional Whyalla, Middleback and Stony Point connection points should be included as contingent projects[3].

Both the timing and scope of this project, and therefore the transmission requirements, are uncertain at this point in time.

If the trigger event occurs the proposed contingent project would be reasonably required to meet the Rules capital expenditure objectives to efficiently meet expected demand for prescribed transmission services and to comply with all applicable regulatory obligations associated with the provision of prescribed transmission services.

1.5 Contingent capital expenditure

The proposed contingent project is estimated to cost $33 million.

This estimate is based on the establishment of a nodal 275/132 kV substation to the south of Cultana with 2 x 200 MVA transformers (it is expected that construction of a double circuit 275 kV line from Cultana to Port Lincoln will be completed prior to the need for this project).

The methodology used for developing the forecast cost estimate is described in section 5.8.6 of ElectraNet's Revenue Proposal.

[2] This Guideline is available at: http://www.gridaustralia.com.au/index.php?option=com_docman&task=doc_download&Itemid=&gid=106

[3] A copy of this report has been made available to the AER on a confidential basis, due to the inclusion of confidential customer information

ElectraNet notes that by definition it is generally not possible to accurately define the scope of a proposed contingent project at this early stage. Therefore, the estimated cost of the project is indicative only. A detailed project scope and cost estimate will be required before any amendment to the revenue determination is considered by the AER should the specified trigger event occur during the regulatory period.

The estimated contingent capital expenditure exceeds the applicable contingent project threshold of $14.6 million (see section 5.10 of ElectraNet's Revenue Proposal).

1.6 Demonstration of rules compliance

ElectraNet considers that this project should be accepted as a contingent project for the forthcoming regulatory control period as it complies with the provisions set down in clause 6A.8.1(b) of the Rules as:

a) it is reasonably required to achieve the capital expenditure objectives as set out in 1.4;

a) it is not otherwise provided for in the total forecast capital expenditure;

b) it reasonably reflects the capital expenditure criteria, noting that the costs are an estimate at this point;

c) it exceeds the contingent project threshold as set out in 1.5;

d) it complies with the requirements of the Submission Guidelines; and

e) it has an appropriately defined trigger event as set out in 1.3.

2. Lower Eyre Peninsula Reinforcement

2.1 Background

The load in the Eyre Peninsula region is primarily related to small scale mining, residential and commercial activities, with seasonal primary industry activity (grain handling). State government mineral resources forecasts indicate that the balance of loading on the Eyre Peninsula will move towards large scale mining activities, dominated by iron ore extraction and handling over the next 5-10 years.

The recent Resources and Energy Infrastructure Demand Study published by RESIC highlighted the positive economic outlook in the longer term and prospect of significant new mining loads requiring connection to the transmission network[4].

The existing network infrastructure in the area consists of a double circuit 275 kV line from Davenport to Cultana and two single circuit 132 kV lines from Cultana to Whyalla 132 kV substation. In addition, radial 132 kV circuits lead from Cultana to Stony Point and from Cultana to Yadnarie and then to Port Lincoln 132 kV substations. A further 132 kV radial line runs west from Yadnarie to Wudinna 132 kV substation.

The underlying distribution network consists of a mixture of 66 kV and 33 kV sub-transmission lines on the Peninsula that radiate from and are fed from the Whyalla, Stony Point, Yadnarie, Wudinna and Port Lincoln 132 kV substations.

Located at Port Lincoln is a diesel fired gas turbine power station contracted to provide network support to the transmission network with three units (two located on the 132 kV bus and one located on the 33 kV bus) with a nominal rating of 25 MW and a maximum contracted summer output of 49 MW.

2.2 Project description

Reinforcement of the Eyre Peninsula network south of Cultana by constructing a double circuit 275 kV line from Cultana to Port Lincoln, the replacement of the 132 kV section at Port Lincoln and the installation of an SVC in the region (should it be required).

ElectraNet considers that the project should be accepted as a contingent project for the regulatory period because of uncertainty about the trigger event occurring and the scope and costs of the project.

2.3 Trigger event

- Demand forecast at Port Lincoln exceeding 49 MW; and
- Successful completion of the RIT-T showing transmission investment is justified.

This trigger event is specific and capable of objective verification, relates to a specific location, and is probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

[4] *Resources and Energy Infrastructure Demand Study*, Resources and Energy Infrastructure Council (RESIC), November 2011

2.4 Project requirement

As Port Lincoln is classified as a Category 3 connection point, the ETC requires ElectraNet to provide N-1 "equivalent line capacity" for at least 100% of contracted Agreed Maximum Demand (AMD) and permits a combination of network and non-network options, with prescribed availability requirements.

The existing 132 kV line from Middleback to Yadnarie is approaching its thermal limit while the Cultana 275/132 kV transformation capacity limit is also close to being exceeded. Under the contingent loss the 132 kV line between Yadnarie and Port Lincoln, the total load at Port Lincoln will exceed the available generation capacity within the forecast period.

These limitations are being driven by load increases on the Peninsula caused by connection point load growth and impending resource developments, which will require extension of the main grid based on connection enquiries received to date. In line with the reliability requirements of the ETC for equivalent network capacity at Port Lincoln, ElectraNet has commenced the RIT-T process with the publication of the PSCR in February 2012.

Both the timing and scope of this project, and therefore the transmission requirements, are uncertain at this point in time.

If the trigger event occurs the proposed contingent project would be reasonably required to meet the Rules capital expenditure objectives to efficiently meet expected demand for prescribed transmission services and to comply with all applicable regulatory obligations associated with the provision of prescribed transmission services.

2.5 Contingent capital expenditure

The proposed contingent project is estimated to cost $588 million.

This estimate is based on the reinforcement of the Eyre Peninsula network to the south of Cultana by constructing a double circuit 275 kV line from Cultana to Port Lincoln. This project will also cover the scope of works that is required to replace the Port Lincoln 132 kV section and the installation of an SVC in the region for dynamic voltage control (should it be deemed to be required).

The methodology used for developing the forecast cost estimate is described in section 5.8.6 of ElectraNet's Revenue Proposal.

ElectraNet notes that by definition it is generally not possible to accurately define the scope of a proposed contingent project at this early stage. Therefore, the estimated cost of the project is indicative only. A detailed project scope and cost estimate will be required before any amendment to the revenue determination is considered by the AER should the specified trigger event occur during the regulatory period.

The estimated contingent capital expenditure exceeds the applicable contingent project threshold of $14.6 million (see section 5.10 of ElectraNet's Revenue Proposal).

2.6 Demonstration of rules compliance

ElectraNet considers that this project should be accepted as a contingent project for the forthcoming regulatory control period as it complies with the provisions set down in clause 6A.8.1(b) of the Rules as:

a) it is reasonably required to achieve the capital expenditure objectives as set out in 2.4;

a) it is not otherwise provided for in the total forecast capital expenditure;

b) it reasonably reflects the capital expenditure criteria, noting that the costs are an estimate at this point;

c) it exceeds the contingent project threshold as set out in 2.5;

d) it complies with the requirements of the Submission Guidelines; and

e) it has an appropriately defined trigger event as set out in 2.3.

3. Upper Eyre Peninsula Reinforcement

3.1 Background

The load in the Eyre Peninsula region is primarily related to small scale mining, residential and commercial activities, with seasonal primary industry activity (grain handling). State Government mineral resources forecasts indicate that the balance of loading on the Eyre Peninsula will move towards large scale mining activities, dominated by iron ore extraction and handling over the next 5-10 years.

The recent Resources and Energy Infrastructure Demand Study published by RESIC highlighted the positive economic outlook in the longer term and prospect of significant new mining loads requiring connection to the transmission network[5].

The existing network infrastructure in the area consists of a double circuit 275 kV line from Davenport to Cultana and two single circuit 132 kV lines from Cultana to Whyalla 132 kV substation. In addition, radial 132 kV circuits lead from Cultana to Stony Point and from Cultana to Yadnarie and then to Port Lincoln 132 kV substations. A further 132 kV radial line runs west from Yadnarie to Wudinna 132 kV substation.

The underlying distribution network consists of a mixture of 66 kV and 33 kV sub-transmission lines on the Peninsula that radiate from and are fed from the Whyalla, Stony Point, Yadnarie, Wudinna and Port Lincoln 132 kV substations.

Located at Port Lincoln is a diesel fired gas turbine power station contracted to provide network support to the transmission network with three units (two located on the 132 kV bus and one located on the 33 kV bus) with a nominal rating of 25 MW and a maximum contracted summer output of 49 MW.

As this project would occur following the Lower Eyre Peninsula Reinforcement, at the time this project commences, a double circuit 275 kV line from Cultana to Yadnarie to Port Lincoln will be in existence along with 275/132 kV transformation at both Yadnarie and Port Lincoln 275 kV substations.

3.2 Project description

Reinforcement of the Eyre Peninsula network north of Cultana by constructing a double circuit 275 kV line from Davenport North to Cultana along with the construction of a new Davenport North switching station (near Yorkey's Crossing). In addition to the new double circuit line and switching station works, line reconfiguration in the upper north region of South Australia will be required to make effective use of the existing network.

ElectraNet considers that the project should be accepted as a contingent project for the regulatory period because of uncertainty about the trigger event occurring and the scope and costs of the project.

[5] *Resources and Energy Infrastructure Demand Study*, Resources and Energy Infrastructure Council (RESIC), November 2011

3.3 Trigger event

- Customer commitment to connect increasing the total forecast demand supplied from Cultana to above 590 MW; and
- Successful completion of the RIT-T showing the proposed network development is justified.

This trigger event is specific and capable of objective verification, relates to a specific location, and is probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

3.4 Project requirement

The Rules require ElectraNet to comply with the power system performance and quality of supply standards set out in schedule 5.1. The Rules mandate system security requirements (e.g. operation allowing for the next contingency) and reliability requirements (e.g. N-1 for the meshed network). The ETC in Clause 2.1.1 also places specific obligations on ElectraNet to plan, develop and operate the transmission network such that there will be no requirement to shed load under reasonable and foreseeable operating conditions.

A major customer load expansion on the Eyre Peninsula would require reinforcement of the 275 kV network between Davenport and Cultana. Following the future development of Olympic Dam, the number of available 275 kV exits at Davenport would be exhausted. Local heritage issues prevent expansion of the existing site, requiring the development of a new switching station to the north of the existing Davenport substation and a reconfiguration of the 275 kV network in the area.

Both the timing and scope of this project, and therefore the transmission requirements, are uncertain at this point in time.

If the trigger event occurs the proposed contingent project would be reasonably required to meet the Rules capital expenditure objectives to efficiently meet expected demand for prescribed transmission services and to comply with all applicable regulatory obligations associated with the provision of prescribed transmission services.

3.5 Contingent capital expenditure

The proposed contingent project is estimated to cost $113 million.

This estimate is based on the reinforcement of the Eyre Peninsula network to the north of Cultana by constructing a double circuit 275 kV line from a new switching station at Davenport North to Cultana. In addition, the existing and proposed 275 kV lines to the Olympic Dam mine will be turned in and out of this site to provide a reliable power supply and to allow for the subsequent reinforcement of the 275 kV Main Grid that traverses the Mid North region to the main load centre in Adelaide.

The methodology used for developing the forecast cost estimate is described in section 5.8.6 of ElectraNet's Revenue Proposal.

ElectraNet notes that by definition it is generally not possible to accurately define the scope of a proposed contingent project at this early stage. Therefore, the estimated cost of the project is indicative only. A detailed project scope and cost estimate will be required

before any amendment to the revenue determination is considered by the AER should the specified trigger event occur during the regulatory period.

The estimated contingent capital expenditure exceeds the applicable contingent project threshold of $14.6 million (see section 5.10 of ElectraNet's Revenue Proposal).

3.6 Demonstration of rules compliance

ElectraNet considers that this project should be accepted as a contingent project for the forthcoming regulatory control period as it complies with the provisions set down in clause 6A.8.1(b) of the Rules as:

a) it is reasonably required to achieve the capital expenditure objectives as set out in 3.4;

b) it is not otherwise provided for in the total forecast capital expenditure;

c) it reasonably reflects the capital expenditure criteria, noting that the costs are an estimate at this point;

d) it exceeds the contingent project threshold as set out in 3.5;

e) it complies with the requirements of the Submission Guidelines; and

f) it has an appropriately defined trigger event as set out in 3.3.

4. Riverland Reinforcement

4.1 Background

Load growth in the Riverland area has been moderated in recent years by drought conditions that have impacted on irrigation activity. Despite this recent trend, it is anticipated that a major network augmentation will be required in the region due to some recovery of load in both South Australia and also Victoria. This inter-regional load growth affects the availability of the Murraylink interconnector from Red Cliffs 220 kV substation in Victoria to transfer power to Monash 132 kV substation in South Australia.

The existing network infrastructure in the area consists of two 132 kV lines from Robertstown to North West Bend to Monash, the 132 kV line from Monash to Berri and the two 66 kV sub-transmission lines from Monash to Berri. The #2 circuit between Robertstown and North West Bend runs via the Morgan to Whyalla SA Water Pumping Stations.

The underlying distribution network consists of multiple 66 kV sub-transmission lines that radiate from and are fed from the North West Bend, Monash and Berri 132 kV substations.

4.2 Project description

Construction of a new double circuit 275 kV transmission line and associated substation works to reinforce the Riverland region of South Australia.

ElectraNet considers that the project should be accepted as a contingent project for the regulatory period because of uncertainty about the trigger event occurring and the scope and cost of the project.

4.3 Trigger event

- An increase of 12.5 MW in load forecast above the forecast published in the 2011 APR for 2018-19 for the North West Bend and Berri/Monash connection points OR publication by AEMO of available Murraylink dispatch into South Australia that is insufficient to provide the necessary network support to meet ETC reliability standards in the Riverland region; and
- Successful completion of the RIT-T showing transmission investment is justified.

This trigger event is specific and capable of objective verification, relates to a specific location or locations, and is probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

4.4 Project requirement

As Berri and North West Bend are both classified as Category 4 connection points, the ETC requires ElectraNet to provide N-1 equivalent line and transformer capacity for at least 100% of contracted Agreed Maximum Demand (AMD).

Load growth in Victoria places a limit on the available Murraylink dispatch into South Australia. With additional load growth in the Victorian Riverland region, transfer into South Australia from Victoria at times of peak loading is reduced, leading to an overload of the

North West Bend to Monash #1 132 kV circuit and under voltage at Berri/Monash under contingency conditions. In addition, with further load growth in the South Australian Riverland region, thermal overload of the North West Bend to Monash #1 132 kV circuit and under voltage at Berri/Monash would occur with the contingent loss of Murraylink at peak load conditions.

AEMO has commenced an investigation into reinforcement of the 220 kV network in North Western Victoria with the publication of the PSCR in April 2012. It is anticipated that the result of this investigation will be several projects in North Western Victoria that will ensure Murraylink has the capacity to export to South Australia when required. In addition, a series of capacitor installations in South Australia (which form part of the capital expenditure forecast for the forthcoming regulatory period) will ensure that the full thermal rating of the 132 kV lines in the Riverland can be utilised, delaying the need for major augmentation. Once this thermal line rating is exceeded, major augmentation of the Riverland 132 kV network will then be required to meet projected demand growth and to maintain ETC reliability standards.

Both the timing and scope of this project, and therefore the transmission requirements, are uncertain at this point in time.

If the trigger event occurs the proposed contingent project would be reasonably required to meet the Rules capital expenditure objectives to efficiently meet expected demand for prescribed transmission services, comply with all applicable regulatory obligations associated with the provision of prescribed transmission services and maintain the quality, reliability and security of supply of prescribed services.

4.5 Contingent capital expenditure

The proposed contingent project is estimated to cost $407 million.

This estimate is based on constructing a double circuit 275 kV line from Robertstown to Monash and replacing the existing Berri and Monash 132/66 kV transformers with a more efficient 275/66 kV transformation. The rebuilding of one of the existing 132 kV transmission lines connecting Monash to Berri substations as a double circuit 66 kV line is also included in the scope of the project along with the removal of all ElectraNet 132 kV assets from Berri.

The methodology used for developing the forecast cost estimate is described in section 5.8.6 of ElectraNet's Revenue Proposal.

ElectraNet notes that by definition it is generally not possible to accurately define the scope of a proposed contingent project at this early stage. Therefore, the estimated cost of the project is indicative only. A detailed project scope and cost estimate will be required before any amendment to the revenue determination is considered by the AER should the specified trigger event occur during the regulatory period.

The estimated contingent capital expenditure exceeds the applicable contingent project threshold of $14.6 million (see section 5.10 of ElectraNet's Revenue Proposal).

4.6 Demonstration of rules compliance

ElectraNet considers that this project should be accepted as a contingent project for the forthcoming regulatory control period as it complies with the provisions set down in clause 6A.8.1(b) of the Rules as:

a) it is reasonably required to achieve the capital expenditure objectives as set out in 4.4;

b) it is not otherwise provided for in the total forecast capital expenditure;

c) it reasonably reflects the capital expenditure criteria, noting that the costs are an estimate at this point;

d) it exceeds the contingent project threshold as set out in 4.5;

e) it complies with the requirements of the Submission Guidelines; and

f) it has an appropriately defined trigger event as set out in 4.3.

5. Fleurieu Peninsula Reinforcement

5.1 Background

The towns located in the Fleurieu Peninsula region, to the south of Adelaide and located between Willunga to the north, Goolwa to the east and Yankalilla to the west are rapidly increasing in population, particularly the towns of Victor Harbor, Port Elliot, Middleton and Goolwa.

The existing network infrastructure in the area consists of a transmission connection to the lower southern suburbs at Morphett Vale East 275 kV substation. From this point, ETSA Utilities operates a 66 kV sub-transmission system that currently supplies both Goolwa and Victor Harbor and Yankalilla via single radial 66 kV sub-transmission lines that emanate from Willunga. There is also an underlying 33 kV distribution system that ultimately provides power supply to Kangaroo Island via a single 33 kV undersea cable.

5.2 Project description

Construction of a double circuit 275 kV transmission line to extend the existing transmission network and establish a new distribution connection point on the Fleurieu Peninsula.

ElectraNet considers that the project should be accepted as a contingent project for the regulatory period because of uncertainty about the trigger event occurring and the scope and costs of the project.

5.3 Trigger event

- Formal request for a new regulated connection point from the DNSP; and
- Successful completion of the Regulatory Test demonstrating a transmission solution is economically justified

This trigger event is specific and capable of objective verification, relates to a specific location or locations, and is probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

5.4 Project requirement

ETSA Utilities is currently performing the Regulatory Test to address emerging network limitations on the Fleurieu Peninsula. Additional load growth on the Fleurieu Peninsula, following the expected implementation of a distribution or non-network solution, will lead to thermal and voltage limitations on the 66 kV sub-transmission lines supplying the major load centres on the Peninsula. The capacity of the distribution system following the deployment of this solution is expected to be exceeded by around 2020, and any unexpected demand increase above current demand forecasts will advance the need for this development.

The potential need for this project has been identified in a distribution planning study recommending that a Fleurieu Peninsula connection point be included as a contingent project[6].

Both the timing and scope of this project, and therefore the transmission requirements, are uncertain at this point in time.

If the trigger event occurs the proposed contingent project would reasonably be required to meet the Rules capital expenditure objectives to efficiently meet expected demand for prescribed transmission services and to comply with all applicable regulatory obligations associated with the provision of prescribed transmission services.

5.5 Contingent capital expenditure

The proposed contingent project is estimated to cost $210 million.

This estimate is based on the construction of a new 275 kV switching station at Kanmantoo North cut into the existing Tungkillo to Cherry Gardens 275 kV circuits and a new double circuit 275 kV transmission line to Square Water Hole, the site of a new ETC Category 4 275/66 kV connection point substation.

The methodology used for developing the forecast cost estimate is described in section 5.8.6 of ElectraNet's Revenue Proposal.

ElectraNet notes that by definition it is generally not possible to accurately define the scope of a proposed contingent project at this early stage. Therefore, the estimated cost of the project is indicative only. A detailed project scope and cost estimate will be required before any amendment to the revenue determination is considered by the AER should the specified trigger event occur during the regulatory period.

The estimated contingent capital expenditure exceeds the applicable contingent project threshold of $14.6 million (see section 5.10 of ElectraNet's Revenue Proposal).

5.6 Demonstration of rules compliance

ElectraNet considers that this project should be accepted as a contingent project for the forthcoming regulatory control period as it complies with the provisions set down in clause 6A.8.1(b) of the Rules as:

a) it is reasonably required to achieve the capital expenditure objectives as set out in 5.4;

b) it is not otherwise provided for in the total forecast capital expenditure;

c) it reasonably reflects the capital expenditure criteria, noting that the costs are an estimate at this point;

d) it exceeds the contingent project threshold as set out in 5.5;

e) it complies with the requirements of the Submission Guidelines; and

f) it has an appropriately defined trigger event as set out in 5.3.

[6] A copy of this report has been made available to the AER on a confidential basis, due to the inclusion of confidential customer information

6. Yorke Peninsula Reinforcement

6.1 Background

Load growth on the Yorke Peninsula is concentrated primarily in the 'copper triangle' towns of Kadina, Moonta and Wallaroo but is affecting all settlements on the Peninsula to some extent. In addition to the residential, commercial and agricultural based load growth that is currently being experienced; mineral resource developments are also being pursued in this area. ElectraNet has received load enquiries for significant connections in the past 12 months, with one party having proceeded to feasibility study stage and a connection anticipated by 2015.

The existing network infrastructure in the area consists of a 132 kV circuit from Bungama to Hummocks and a 132 kV circuit from Waterloo to Hummocks. From Hummocks, a radial 132 kV circuit provides electricity supply to Kadina East and a second radial 132 kV circuit supplies Dalrymple via Ardrossan West.

The underlying distribution network consists of a widespread 33 kV network that is fed from 132 kV substations at Hummocks, Kadina East, Ardrossan West and at Dalrymple.

6.2 Project description

Construction of a new double circuit 275 kV transmission line (cut into the existing Para to Bungama 275 kV circuit) and establishment of a 275/132 kV substation at Hummocks.

ElectraNet considers that the project should be accepted as a contingent project for the regulatory period because of uncertainty about the trigger event occurring and the scope and costs of the project.

6.3 Trigger event

- Aggregate demand forecast for the Hummocks, Kadina East, Ardrossan West and Dalrymple connection points exceeding 90 MW; and
- Successful completion of the RIT-T showing a new connection point in the region is justified.

This trigger event is specific and capable of objective verification, relates to a specific location or locations, and is probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

6.4 Project requirement

Additional load growth in the Yorke Peninsula towns and the introduction of new mineral resource developments will result in thermal limitations on the 132 kV network to the north of Hummocks following a single line contingency, resulting in voltages below the minimum stands specified in the Rules and potential voltage collapse.

The Waterloo to Hummocks 132 kV line exceeds its thermal rating under the contingent loss of the Bungama to Hummocks 132 kV line, while under voltage is also experienced in the 33 kV distribution network under this contingency. These system limitations may be efficiently resolved by the construction of a new transmission injection point and

associated line works. The potential need for this project has been identified in a distribution planning study recommending that an Ardrossan South connection point to be included as a contingent project[7].

The scope of this project, and therefore the transmission requirements, are uncertain at this point in time.

If the trigger event occurs the proposed contingent project would be reasonably required to meet the Rules capital expenditure objectives to efficiently meet expected demand for prescribed transmission services, comply with all applicable regulatory obligations associated with the provision of prescribed transmission services and maintain the quality, reliability and security of supply of prescribed services.

6.5 Contingent capital expenditure

The proposed contingent project is estimated to cost $191 million.

This estimate is based on the construction of a new double circuit 275 kV transmission line from Blyth West (initially turned in and out of the existing Para to Bungama 275 kV circuit) to Hummocks. Also included is the construction of a new 275/132 kV substation at Hummocks, the installation of 1 x 200 MVA 275/132 kV transformer and 2 x 60 MVA 132/33 kV transformers and other associated substation works at Hummocks.

The methodology used for developing the forecast cost estimate is described in section 5.8.6 of ElectraNet's Revenue Proposal.

ElectraNet notes that by definition it is generally not possible to accurately define the scope of a proposed contingent project at this early stage. Therefore, the estimated cost of the project is indicative only. A detailed project scope and cost estimate will be required before any amendment to the revenue determination is considered by the AER should the specified trigger event occur during the regulatory period.

The estimated contingent capital expenditure exceeds the applicable contingent project threshold of $14.6 million (see section 5.10 of ElectraNet's Revenue Proposal).

6.6 Demonstration of rules compliance

ElectraNet considers that this project should be accepted as a contingent project for the forthcoming regulatory control period as it complies with the provisions set down in clause 6A.8.1(b) of the Rules as:

a) it is reasonably required to achieve the capital expenditure objectives as set out in 6.4;

b) it is not otherwise provided for in the total forecast capital expenditure;

c) it reasonably reflects the capital expenditure criteria, noting that the costs are an estimate at this point;

d) it exceeds the contingent project threshold as set out in 6.5;

e) it complies with the requirements of the Submission Guidelines; and

f) it has an appropriately defined trigger event as set out in 6.3.

[7] A copy of this report has been made available to the AER on a confidential basis, due to the inclusion of confidential customer information

7. Para – Davenport Transmission Upgrade

7.1 Background

Due to the growth of renewable generation in the Mid North and Eyre Peninsula region, network constraints are emerging as load flow patterns change. Any further increase in generation in either the Mid North, the Eyre Peninsula or the upper North regions will lead to increasing levels of congestion as the thermal ratings of the two 275 kV lines between Adelaide (Para to Davenport via Brinkworth and Bungama substations) are reached. The potential closure and seasonal shut down of the coal fired generation located at Port Augusta may further impact on these constraints.

The existing network infrastructure in the area consists of the double circuit 275 kV lines from Tungkillo to Davenport via Robertstown and two single circuit 275 kV lines from Para to Davenport via Bungama and Brinkworth respectively. Underlying this 275 kV main backbone grid, there are several 132 kV circuits that are supplied from the major 275 kV substations located at Bungama, Brinkworth and Robertstown. A number of wind farms are also located on both the 132 kV and the 275 kV networks throughout the region.

ETSA Utilities operates a widespread 33 kV distribution network that is fed from 132 kV substations at Waterloo, Hummocks, Clare North, Brinkworth, Bungama, Port Pirie and Baroota.

7.2 Project description

Uprating (or rebuilding) of the Para to Brinkworth to Davenport and/or the Para to Bungama to Davenport 275 kV transmission lines.

ElectraNet considers that the project should be accepted as a contingent project for the regulatory period because of uncertainty about the trigger event occurring and the scope and costs of the project.

7.3 Trigger event

- Successful completion of the RIT-T demonstrating positive net market benefits.

This trigger event is specific and capable of objective verification, relates to a specific location or locations, and is probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

7.4 Project requirement

The existing Para to Brinkworth to Davenport 275 kV transmission lines were recently up-rated from their original 49°C to 65°C thermal operating capacity. The Para to Bungama to Davenport circuits were up-rated from their original 49°C to 80°C thermal operating capacity previously. These ratings have been identified as adequate to accommodate the existing loading on the transmission network.

However, the thermal capacity of these lines would need to be increased further if expansion of generation at Hallett or a similar mid-point location between Adelaide and Port Augusta occurs. Generation expansion is seen to be a likely event in response to the

number of new load developments proposed within the State and prospect of increased export capability over the South East to Heywood interconnector (currently the subject of a RIT-T process).

The magnitude of the market benefit delivered by this project, and therefore the transmission requirements, are uncertain at this point in time.

If the trigger event occurs the proposed contingent project would deliver net market benefits and be reasonably required to meet the Rules capital expenditure objective to efficiently meet the expected demand for prescribed transmission services over the regulatory control period.

7.5 Contingent capital expenditure

The proposed contingent project is estimated to cost $50 million.

This estimate is based on uprating the Para to Brinkworth to Davenport and the Para to Bungama to Davenport 275 kV transmission lines to ensure a thermal operating temperature exceeding 80°C is achieved.

The methodology used for developing the forecast cost estimate is described in section 5.8.6 of ElectraNet's Revenue Proposal.

ElectraNet notes that by definition it is generally not possible to accurately define the scope of a proposed contingent project at this early stage. Therefore, the estimated cost of the project is indicative only. A detailed project scope and cost estimate will be required before any amendment to the revenue determination is considered by the AER should the specified trigger event occur during the regulatory period.

The estimated contingent capital expenditure exceeds the applicable contingent project threshold of $14.6 million (see section 5.10 of ElectraNet's Revenue Proposal).

7.6 Demonstration of rules compliance

ElectraNet considers that this project should be accepted as a contingent project for the forthcoming regulatory control period as it complies with the provisions set down in clause 6A.8.1(b) of the Rules as:

a) it is reasonably required to achieve the capital expenditure objectives as set out in 7.4;

b) it is not otherwise provided for in the total forecast capital expenditure;

c) it reasonably reflects the capital expenditure criteria, noting that the costs are an estimate at this point;

d) it exceeds the contingent project threshold as set out in 7.5;

e) it complies with the requirements of the Submission Guidelines; and

f) it has an appropriately defined trigger event as set out in 7.3.

8. South East to Heywood Interconnection Upgrade

8.1 Background

Increasing network constraints on intra and inter-regional power transfers are being experienced in the South East. Due to the growth of, primarily renewable generation in these areas, the loading of transmission assets (both lines and transformers) is being actively managed by AEMO to remain within thermal limits. Due to the current configuration of the network and the rating of some of the assets in the region, economic generation dispatch is being impacted.

The existing network infrastructure in the area consists of the double circuit 275 kV lines from Tailem Bend to South East 275 kV substations and the two 132 kV circuits that lead from Tailem Bend to Keith and from there to South East. One circuit runs via Snuggery, Blanche and Mount Gambier, the other runs via Kincraig and Penola West. ETSA Utilities operates a 33 kV distribution network that is fed from 132 kV substations at Tailem Bend, Keith, Kincraig, Penola West, Snuggery, Blanche and Mount Gambier.

8.2 Project description

Upgrade of the Heywood interconnector capacity to 650 MW transfer capacity.

ElectraNet considers that the project should be accepted as a contingent project for the regulatory period because of uncertainty about the trigger event occurring and the scope and costs of the project.

8.3 Trigger event

- Successful completion of the RIT-T demonstrating positive net market benefits.

This trigger event is specific and capable of objective verification, relates to a specific location or locations, and is probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

8.4 Project requirement

With the existing levels of generation and load, intra and inter-regional transfer limitations are being experienced with an associated impact on economic generation dispatch and pool price outcomes. The Tailem Bend to Keith #1 and the Keith to Snuggery 132 kV lines run in parallel to the 275 kV interconnection circuits and prevent this capacity from being fully utilised because of the low thermal ratings of these two sub-transmission circuits.

In addition, there are a number of other network limitations in the South East that reduce the available capacity of the interconnection circuits below their potential capacity. ElectraNet and AEMO have commenced a joint RIT-T consultation process to investigate technically and economically feasible options to address these limitations, with the publication of the PSCR in December 2011. Further information on the limitations that constrain the South East network and the inter-regional transfers can be found in that document.

The magnitude of the net market benefit delivered by this project, and therefore the likely transmission requirements and timing, are uncertain at this point in time.

If the trigger event occurs the proposed contingent project would deliver net market benefits and would reasonably be required to meet the Rules capital expenditure objective to efficiently meet the expected demand for prescribed transmission services over the regulatory control period.

8.5 Contingent capital expenditure

The proposed contingent project is estimated to cost $96 million.

This estimate is based on upgrading the Heywood interconnector capacity to 650 MW (increasing capacity by 190 MW) for transfers to and from South Australia by adding 30% series compensation at Black Range, adding a third 160 MVA 275/132 kV transformer at South East, decommissioning the Snuggery to Keith and the Keith to Tailem Bend 132 kV circuits and installing two 15 Mvar capacitors at Keith. The cost estimate does not however include any of the supporting works that are required in Victoria.

The methodology used for developing the forecast cost estimate is described in section 5.8.6 of ElectraNet's Revenue Proposal.

ElectraNet notes that by definition it is generally not possible to accurately define the scope of a proposed contingent project at this early stage. Therefore, the estimated cost of the project is indicative only. A detailed project scope and cost estimate will be required before any amendment to the revenue determination is considered by the AER should the specified trigger event occur during the regulatory period.

The estimated contingent capital expenditure exceeds the applicable contingent project threshold of $14.6 million (see section 5.10 of ElectraNet's Revenue Proposal).

8.6 Demonstration of rules compliance

ElectraNet considers that this project should be accepted as a contingent project for the forthcoming regulatory control period as it complies with the provisions set down in clause 6A.8.1(b) of the Rules as:

a) it is reasonably required to achieve the capital expenditure objectives as set out in 8.4;

b) it is not otherwise provided for in the total forecast capital expenditure;

c) it reasonably reflects the capital expenditure criteria, noting that the costs are an estimate at this point;

d) it exceeds the contingent project threshold as set out in 8.5;

e) it complies with the requirements of the Submission Guidelines; and

f) it has an appropriately defined trigger event as set out in 8.3.

9. Northern Transmission Reinforcement

9.1 Background

BHP Billiton has stated its intention to increase the load at its Olympic Dam mine in the Mid North Region to beyond 260 MW, which is anticipated by around 2016. Dynamic stability studies recently conducted by ElectraNet have shown that there is a frequency control issue related to the loss of a load of 260 MW or greater on the South Australian network.

It is expected that this load threshold would be reduced should the Heywood interconnector upgrade proceed and increase transfer capacity to Victoria to 650 MW. This will introduce a lower critical load loss threshold in the Upper North Region and introduce the need to augment the supply arrangement to Olympic Dam earlier (studies have not yet been conducted to determine what this critical threshold is).

The existing network infrastructure in the area consists of a radial 275 kV circuit (owned by BHPB) from Davenport to Olympic Dam West along with a radial 132 kV line from Davenport to Leigh Creek via Neuroodla and another radial 132 kV line from Davenport to Pimba via Mount Gunson. From Pimba, BHPB also owns a radial 132 kV circuit that terminates at Olympic Dam North and a short radial line also supplies Woomera.

There are limited distribution assets in this region, with most of the 33 kV distribution network supplied from Davenport 132 kV substation and small 33 kV networks are also connected to Mount Gunson and Neuroodla 132 kV substations.

9.2 Project description

Construction of a new double circuit 275 kV transmission line from Davenport to Olympic Dam West and associated substation works.

ElectraNet considers that the project should be accepted as a contingent project for the regulatory period because of uncertainty about the trigger event occurring and the scope and costs of the project.

9.3 Trigger event

- Customer commitment to connect increasing the total forecast demand supplied from Davenport to above 260 MW; and
- Successful completion of the RIT-T showing network development in the region is justified.

This trigger event is specific and capable of objective verification, relates to a specific location or locations, and is probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

9.4 Project requirement

Chapter 5 of the Rules requires a TNSP to make an offer of connection to a customer, on application. The ETC requires ElectraNet to submit the applicable standards for a new connection point to ESCOSA for approval. New transmission assets are established in

accordance with the definitions of prescribed, negotiated and non-regulated transmission services established under the Rules. The manner in which ElectraNet applies these definitions is outlined in the Grid Australia Categorisation of Transmission Services Guideline[8] with reference to the minimum service requirements of the ETC. The scope of this project is limited to the prescribed transmission assets established in accordance with these requirements.

An increase in load to a level of 260 MW or greater in the Upper North Region introduces insurmountable load rejection related frequency control issues. BHP Billiton has advised ElectraNet that the load at its Olympic Dam mine is expected to exceed this level by 2016. As a consequence, reinforcement of the radial 275 kV circuit between Davenport and Olympic Dam West would be required.

The dynamic study carried out by ElectraNet considered only the current network arrangements and transfer capability on the Heywood interconnector of 460 MW. As the Heywood PCSR published in October 2011 notes, AEMO and ElectraNet are seeking to increase this transfer level to 650 MW. The impact of this increase in load transfer on the critical load loss threshold in the Upper North has not been studied, neither has the effect of the expected retirement of the Playford Power Station and the seasonal operation of the Northern Power Station. It is however anticipated that both of these network changes will have the effect of reducing the maximum permissible load rejection in the Upper North Region to below the 260 MW under the present operating conditions.

Both the timing and scope of this project, and therefore the transmission requirements, are uncertain at this point in time.

If the trigger event occurs the proposed contingent project would be reasonably required to meet the Rules capital expenditure objectives to efficiently meet expected demand for prescribed transmission services, comply with all applicable regulatory obligations associated with the provision of prescribed transmission services and maintain the quality, reliability and security of supply of prescribed services.

9.5 Contingent capital expenditure

The proposed contingent project is estimated to cost $247 million.

This estimate is based on the construction of a new double circuit 275 kV transmission line from Davenport to Olympic Dam West and the population of two 275 kV switching bays at each end of the line. If it is deemed to be necessary, the scope of this project will also cover the installation of dynamic reactive plant at Davenport or another suitable location in the region.

The methodology used for developing the forecast cost estimate is described in section 5.8.6 of ElectraNet's Revenue Proposal.

ElectraNet notes that by definition it is generally not possible to accurately define the scope of a proposed contingent project at this early stage. Therefore, the estimated cost of the project is indicative only. A detailed project scope and cost estimate will be required before any amendment to the revenue determination is considered by the AER should the specified trigger event occur during the regulatory period.

[8] This Guideline is available at: http://www.gridaustralia.com.au/index.php?option=com_docman&task=doc_download&Itemid=&gid=106

The estimated contingent capital expenditure exceeds the applicable contingent project threshold of $14.6 million (see section 5.10 of ElectraNet's Revenue Proposal).

9.6 Demonstration of rules compliance

ElectraNet considers that this project should be accepted as a contingent project for the forthcoming regulatory control period as it complies with the provisions set down in clause 6A.8.1(b) of the Rules as:

a) it is reasonably required to achieve the capital expenditure objectives as set out in 9.4;

b) it is not otherwise provided for in the total forecast capital expenditure;

c) it reasonably reflects the capital expenditure criteria, noting that the costs are an estimate at this point;

d) it exceeds the contingent project threshold as set out in 9.5;

e) it complies with the requirements of the Submission Guidelines; and

f) it has an appropriately defined trigger event as set out in 9.3.

10. Davenport Reactive Support

10.1 Background

Recent dynamic studies of the South Australian power system at peak load have revealed that with no generation from Playford Power Station and following the loss of a single Northern Power Station unit, there are a number of voltage control and quality of supply issues in the Eyre Peninsula, Upper North and Mid North regions.

In addition to this, Eyre Peninsula and Mid North wind generators are currently constrained down significantly to cover for 'the next contingency' when there is only one Northern Power Station unit in service at Davenport. This level of constraint will increase significantly should Northern Power Station shut down its operations over the winter months (the highest output period for wind generators) and Playford Power Station be retired.

The existing network infrastructure in the area consists of the Davenport 275 kV substation that provides the supply point for all loads in the Upper North and Eyre Peninsula regions. As the entry point for Northern and Playford generation, Davenport presently provides a significant portion of the power supply to the South Australian region. Because of this, there are four 275 kV transmission lines that run between Davenport and substations in the Adelaide metropolitan area.

ETSA Utilities provides distribution services to customers in the city of Port Augusta and the surrounding districts via a meshed 33 kV distribution network fed from the Davenport 132 kV substation.

10.2 Project description

Installation of reactive plant at Davenport for voltage control such as an SVC or suitable alternative.

ElectraNet considers that the project should be accepted as a contingent project for the regulatory period because of uncertainty about the trigger event occurring and the scope and costs of the project.

10.3 Trigger event

- Commitment to the retirement of the Playford Power Station; and
- Successful completion of the RIT-T showing installation of additional reactive support at Davenport is justified.

This trigger event is specific and capable of objective verification, relates to a specific location, and is probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

10.4 Project requirement

The additional load growth anticipated in both the Eyre Peninsula and the Upper North regions of the State and the recent announcement of the impending retirement and scaling

back of operation of Port Augusta based generation has a high potential to create voltage control and quality of supply issues in the region.

Without network augmentation, the maximum load at Olympic Dam that can be connected to the Davenport 275 kV bus without causing voltage instability on the loss of a single Northern Power Station unit at peak load is 265 MW. Following the announcement that Northern Power Station will operate only over the summer months, this maximum load limit would be reduced in the event of a Heywood interconnector upgrade proceeding due to the impact of increased inter-regional power flows, which reduces the amount of load that can survive the loss of the generator.

In addition to this, the level of network congestion seen by the Eyre Peninsula and Mid North wind generators will be significantly higher than present should Northern Power Station shut down its operations over the winter months (the highest output period for the wind farms) and Playford Power Station be retired. This is due to the lack of any other high inertia voltage control point north of the Adelaide metropolitan SVCs and generation, causing a voltage stability limitation on the amount of Mid North and Eyre Peninsula generation that can be dispatched.

The magnitude of the market benefit delivered by this project, and therefore the transmission requirements, are uncertain at this point in time.

If the trigger event occurs the proposed contingent project would be reasonably required to meet the Rules capital expenditure objectives to efficiently meet expected demand for prescribed transmission services and to comply with all applicable regulatory obligations associated with the provision of prescribed transmission services.

10.5 Contingent capital expenditure

The proposed contingent project is estimated to cost $42 million.

This estimate is based on the installation of an SVC at Davenport and associated substation works. The scope of this work also includes the retuning of all power system stabiliser (PSS) units and automatic voltage regulator (AVR) control systems in the South Australian transmission network which will be required as a result of adding this SVC into the system.

The methodology used for developing the forecast cost estimate is described in section 5.8.6 of ElectraNet's Revenue Proposal.

ElectraNet notes that by definition it is generally not possible to accurately define the scope of a proposed contingent project at this early stage. Therefore, the estimated cost of the project is indicative only. A detailed project scope and cost estimate will be required before any amendment to the revenue determination is considered by the AER should the specified trigger event occur during the regulatory period.

The estimated contingent capital expenditure exceeds the applicable contingent project threshold of $14.6 million (see section 5.10 of ElectraNet's Revenue Proposal).

10.6 Demonstration of rules compliance

ElectraNet considers that this project should be accepted as a contingent project for the forthcoming regulatory control period as it complies with the provisions set down in clause 6A.8.1(b) of the Rules as:

a) it is reasonably required to achieve the capital expenditure objectives as set out in 10.4;

b) it is not otherwise provided for in the total forecast capital expenditure;

c) it reasonably reflects the capital expenditure criteria, noting that the costs are an estimate at this point;

d) it exceeds the contingent project threshold as set out in 10.5;

e) it complies with the requirements of the Submission Guidelines; and

f) it has an appropriately defined trigger event as set out in 10.3.

11. Upper South East Generation Expansion

11.1 Background

While the current load/generation balance in the South East can be managed on the existing network, additional generation will lead to thermal limitations on the 275 kV network in the South East.

The existing network infrastructure in the area consists of two single circuit 275 kV lines from Para to Tailem Bend, the double circuit 275 kV line from Tailem Bend to South East and the double circuit 275 kV line from South East to Heywood (in Victoria). In parallel with this 275 kV network is a 132 kV sub-transmission system that runs from Para to Tailem Bend via the Angas Creek, Mannum and Mobilong 132 kV substations. From Tailem Bend there are two 132 kV circuits that lead to Keith and from there, on to South East. One circuit runs via Snuggery, Blanche and Mount Gambier, the other runs via Kincraig and Penola West.

ETSA Utilities operates a meshed 33 kV distribution network that is fed from the 132 kV substations at Angas Creek, Mannum, Mobilong, Tailem Bend, Keith, Kincraig, Penola West, Snuggery, Blanche and Mount Gambier.

11.2 Project description

Construct a single circuit 275 kV transmission line between Para and Tungkillo; string the unstrung circuit on the Tailem Bend to Tungkillo line and complete the diameters at Tungkillo and at Tailem Bend.

ElectraNet considers that the project should be accepted as a contingent project for the regulatory period because of uncertainty about the trigger event occurring and the scope and costs of the project.

11.3 Trigger event

- Successful completion of the RIT-T demonstrating positive net market benefits.

This trigger event is specific and capable of objective verification, relates to a specific location, and is probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

11.4 Project requirement

The establishment of major generation in the Upper South East (near Tepko or Tailem Bend) and the associated increase in power transfer on the network would cause the 275 kV lines between Para and Tailem Bend to exceed their thermal ratings. Thermal limitations would exist on both the transfer of power from the generator to the major load centres in the State, and also on the interconnector with Victoria (both import and export).

The magnitude of the market benefit delivered by this project, and therefore the transmission requirements, are uncertain at this point in time.

If the trigger event occurs the proposed contingent project would deliver net market benefits and would be reasonably required to meet the Rules capital expenditure objectives to efficiently meet expected demand for prescribed transmission services.

11.5 Contingent capital expenditure

The proposed contingent project is estimated to cost $48 million.

This estimate is based on the construction of a third 275 kV circuit between Para and Tungkillo on double circuit towers and stringing the unstrung side of the Tailem Bend to Tungkillo double circuit line. The scope of work will also include the works required to complete the diameters at Para, Tungkillo and at Tailem Bend and associated substation and protection reconfiguration works.

The methodology used for developing the forecast cost estimate is described in section 5.8.6 of ElectraNet's Revenue Proposal.

ElectraNet notes that by definition it is generally not possible to accurately define the scope of a proposed contingent project at this early stage. Therefore, the estimated cost of the project is indicative only. A detailed project scope and cost estimate will be required before any amendment to the revenue determination is considered by the AER should the specified trigger event occur during the regulatory period.

The estimated contingent capital expenditure exceeds the applicable contingent project threshold of $14.6 million (see section 5.10 of ElectraNet's Revenue Proposal).

11.6 Demonstration of rules compliance

ElectraNet considers that this project should be accepted as a contingent project for the forthcoming regulatory control period as it complies with the provisions set down in clause 6A.8.1(b) of the Rules as:

a) it is reasonably required to achieve the capital expenditure objectives as set out in 11.4;

b) it is not otherwise provided for in the total forecast capital expenditure;

c) it reasonably reflects the capital expenditure criteria, noting that the costs are an estimate at this point;

d) it exceeds the contingent project threshold as set out in 11.5;

e) it complies with the requirements of the Submission Guidelines; and

f) it has an appropriately defined trigger event as set out in 11.3.

12. Western Suburbs Reinforcement

12.1 Background

The State Government's 30 Year Plan for Greater Adelaide[9] envisages significant urban infill and population increase in the Western suburbs. Whilst the existing transmission network is adequate to supply the existing load, on current demand forecasts reinforcement will be required in this area by about 2021. Any additional load that materialises will cause thermal overload of transmission transformers and limitations on the 66 kV sub-transmission system, bringing forward this augmentation requirement.

The existing network infrastructure in the area consists of a single 275 kV circuit that leads from Torrens Island to Le Fevre and then to Pelican point and Parafield Gardens West terminating at Para providing two supplies to the Le Fevre 275 kV substation. A double circuit 275 kV line also exits Torrens Island to provide supply to Kilburn (and Northfield), and a 275 kV underground cable runs from Torrens Island to the City West substation.

ETSA Utilities operates a meshed 66 kV sub-transmission system that takes supply from 275 kV substations at Torrens Island, Kilburn and Le Fevre.

12.2 Project description

Establishment of a new DNSP connection point in the Western Suburbs of Adelaide.

ElectraNet considers that the project should be accepted as a contingent project for the regulatory period because of uncertainty about the trigger event occurring and the scope and costs of the project.

12.3 Trigger event

- Formal request for a new regulated connection point from the DNSP
- Successful completion of the RIT-T showing a new connection point in the region is justified

This trigger event is specific and capable of objective verification, relates to a specific location or locations, and is probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

12.4 Project requirement

The group of connection points that supply the Western Suburbs are classified as a Category 4 exit point under the ETC. This requires ElectraNet to provide "N-1" equivalent line and transformer capacity for at least 100% of contracted Agreed Maximum Demand (AMD).

Network load flow studies show that based on current load forecasts, with the contingent loss of the Kilburn 275/66 kV transformer, the 2 x 225 MVA 275/66 kV transformers at Torrens Island will overloaded in 2021. Associated with this overload are underlying distribution system limitations on the 66 kV sub-transmission network. Further demand

[9] A copy of this report is available at http://www.dplg.sa.gov.au/plan4adelaide/index.cfm

growth, as envisaged by the State Government's urban master planning framework for the metropolitan region, would bring these limitations forward.

Inclusion of this project in ElectraNet's revenue proposal is supported by the findings of a DNSP planning report recommending that a new transmission transformer be installed in 2022 to service the Western Suburbs, located at the City West substation[10].

Both the timing and scope of this project, and therefore the transmission requirements, are uncertain at this point in time.

If the trigger event occurs the proposed contingent project would be required to meet the Rules capital expenditure objectives to efficiently meet expected demand for prescribed transmission services and to comply with all applicable regulatory obligations associated with the provision of prescribed transmission services.

12.5 Contingent capital expenditure

The proposed contingent project is estimated to cost $20 million.

This estimate is based on the installation of a new connection point transformer at City West substation with 1 x 300 MVA 275/66 kV transformer supplying the western suburbs and associated switchgear.

The methodology used for developing the forecast cost estimate is described in section 5.8.6 of ElectraNet's Revenue Proposal.

ElectraNet notes that by definition it is generally not possible to accurately define the scope of a proposed contingent project at this early stage. Therefore, the estimated cost of the project is indicative only. A detailed project scope and cost estimate will be required before any amendment to the revenue determination is considered by the AER should the specified trigger event occur during the regulatory period.

The estimated contingent capital expenditure exceeds the applicable contingent project threshold of $14.6 million (see section 5.10 of ElectraNet's Revenue Proposal).

12.6 Demonstration of rules compliance

ElectraNet considers that this project should be accepted as a contingent project for the forthcoming regulatory control period as it complies with the provisions set down in clause 6A.8.1(b) of the Rules as:

a) it is reasonably required to achieve the capital expenditure objectives as set out in 12.4;

b) it is not otherwise provided for in the total forecast capital expenditure;

c) it reasonably reflects the capital expenditure criteria, noting that the costs are an estimate at this point;

d) it exceeds the contingent project threshold as set out in 12.5;

e) it complies with the requirements of the Submission Guidelines; and

f) it has an appropriately defined trigger event as set out in 12.3.

[10] A copy of this report has been made available to the AER on a confidential basis, due to the inclusion of confidential customer information

13. Southern Suburbs Reinforcement

13.1 Background

The State Government's 30 Year Plan for Greater Adelaide[11] envisages significant urban infill and population increase in the Southern suburbs (particularly the inner Southern suburbs). Whilst the existing transmission network is adequate to supply the existing load, on current demand forecasts reinforcement will be required in this area by about 2021. Any additional load that materialises will cause thermal overload of transmission transformers and limitations on the 66 kV sub-transmission system, bringing forward this augmentation requirement.

The existing network infrastructure in the area consists of a 275/66 kV connection point at City West feeding into the inner Southern suburbs and also a single 275/66 kV transformer located at the Magill substation, also feeding into the inner Southern suburbs. In addition to this, the Magill to Cherry Gardens 275 kV circuit has been turned into the Happy Valley 275 kV substation and this supplies the middle section of the Southern suburbs and provides support to the City West and Magill connection points. There is also a single circuit connection from Cherry Gardens to Morphett Vale East and a second single circuit supply from Happy Valley to Morphett Vale East, which supplies all of the lower Southern suburbs, the Fleurieu Peninsula and Kangaroo Island.

ETSA Utilities operates a meshed 66 kV sub-transmission system to cover this whole service area that takes its supply from the aforementioned 275 kV substations at City West, Magill, Happy Valley and Morphett Vale East.

13.2 Project description

Installation of an additional transformer at City West supplying the Southern suburbs, splitting the 66 kV system between Happy Valley and Morphett Vale East and the installation of an additional transformer at Morphett Vale East.

ElectraNet considers that the project should be accepted as a contingent project for the regulatory period because of uncertainty about the trigger event occurring and the scope and costs of the project.

13.3 Trigger event

- An increase in demand exceeding the forecast load published in the 2011 APR for 2018-19 by 60 MW for the aggregate of the Southern Suburbs connection points; and
- Successful completion of the RIT-T showing that modifying the existing connection points is justified.

This trigger event is specific and capable of objective verification, relates to a specific location, and is probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

[11] A copy of this report is available at http://www.dplg.sa.gov.au/plan4adelaide/index.cfm

13.4 Project requirement

The group of connection points that supply the Southern Suburbs are classified as a Category 4 grouped exit point under the ETC. This requires ElectraNet to provide "N-1" equivalent line and transformer capacity for at least 100% of contracted Agreed Maximum Demand (AMD).

Based on existing demand forecasts it will no longer be possible to comply with this requirement from 2021, as the contingent outage of the single 275/66 kV transformer at City West will cause thermal limitations on the distribution network between City West and Happy Valley. Network load flow studies show that, based on current load forecasts, to address this network limitation a second transformer at City West and a second 275 kV cable from Torrens Island feeding into the Southern Inner Metro 66 kV network will be required.

Installation of this additional transformer will cause fault levels to rise in the distribution network and the Southern suburbs 66 kV sub-transmission network will need to be split between Happy Valley and Morphett Vale East, creating the Southern Outer Metro network. At the time this split occurs in the Southern suburbs sub-transmission network, a third transformer will need to be installed at Morphett Vale East to support the Southern Outer Metro 66 kV sub-transmission network to ensure compliance with the requirements of the ETC.

A load increase of 60 MW (approximately one year's load growth) over the current aggregated load forecast for the Southern suburbs will advance this requirement for transmission system augmentation into the forthcoming Regulatory period.

Inclusion of this project in ElectraNet's revenue proposal is supported by the findings of a DNSP planning report recommending the split of the Southern suburbs 66 kV sub-transmission network following installation of a second City West transformer for the Southern Suburbs[12].

Both the timing and scope of this project, and therefore the transmission requirements, are uncertain at this point in time.

If the trigger event occurs the proposed contingent project would be reasonably required to meet the Rules capital expenditure objectives to efficiently meet expected demand for prescribed transmission services and to comply with all applicable regulatory obligations associated with the provision of prescribed transmission services.

13.5 Contingent capital expenditure

The proposed contingent project is estimated to cost $171 million.

This estimate is based on installing a single 275/66 kV transformer at City West supplying the Southern suburbs along with a second 275 kV cable from Torrens Island to City West and all associated switchgear. This scope of work also includes works to split the 66 kV sub-transmission network between the Happy Valley and the Morphett Vale East transmission connection points, the installation of a third 275/66 kV transformer at Morphett Vale East along with associated switchgear and single 275 kV CB to complete the mesh bus arrangement.

[12] A copy of this report has been made available to the AER on a confidential basis, due to the inclusion of confidential customer information

The methodology used for developing the forecast cost estimate is described in section 5.8.6 of ElectraNet's Revenue Proposal.

ElectraNet notes that by definition it is generally not possible to accurately define the scope of a proposed contingent project at this early stage. Therefore, the estimated cost of the project is indicative only. A detailed project scope and cost estimate will be required before any amendment to the revenue determination is considered by the AER should the specified trigger event occur during the regulatory period.

The estimated contingent capital expenditure exceeds the applicable contingent project threshold of $14.6 million (see section 5.10 of ElectraNet's Revenue Proposal).

13.6 Demonstration of rules compliance

ElectraNet considers that this project should be accepted as a contingent project for the forthcoming regulatory control period as it complies with the provisions set down in clause 6A.8.1(b) of the Rules as:

a) it is reasonably required to achieve the capital expenditure objectives as set out in 13.4;

b) it is not otherwise provided for in the total forecast capital expenditure;

c) it reasonably reflects the capital expenditure criteria, noting that the costs are an estimate at this point;

d) it exceeds the contingent project threshold as set out in 13.5;

e) it complies with the requirements of the Submission Guidelines and

f) it has an appropriately defined trigger event as set out in 13.3.

14. Northern Suburbs Reinforcement

14.1 Background

The State Government's 30 Year Plan for Greater Adelaide[13] envisages significant urban infill and population increase in the Northern suburbs, along with the expansion of the townships of Roseworthy and Gawler into significant population centres. Whilst the existing transmission network is adequate to supply the existing load, on current demand forecasts advice from the DNSP indicates that a major expansion of the 66 kV system is required in this area by about 2021 along with the establishment of an additional transmission connection point. Any additional load that materialises will cause thermal overloads on the 66 kV sub-transmission and 33 kV distribution systems, bringing forward this augmentation requirement.

The existing network infrastructure in the area consists of a single circuit 275 kV line from Para to Bungama and a second single circuit 275 kV line from Para to Brinkworth (which will provide supply to the Munno Para 275 kV substation that is presently under construction). The four lines that run between Torrens Island and Para (supplying Parafield Gardens West and Para 275 kV substations) and also the two lines that connect Torrens Island to Northfield 275 kV substation also have influence on this area of the metropolitan load.

ETSA Utilities operates a meshed 66 kV sub-transmission network to supply the Northern suburbs load which takes its supply from connection points at Northfield, Parafield Gardens West, Para and (from 2014) Munno Para.

14.2 Project description

Establishment of new connection point in the vicinity of the town of Roseworthy to be known as Kingsford.

ElectraNet considers that the project should be accepted as a contingent project for the regulatory period because of uncertainty about the trigger event occurring and the scope and costs of the project.

14.3 Trigger event

- Formal request for a new regulated connection point from the DNSP OR Formal request to modify an existing connection point from the DNSP; and
- Successful completion of the RIT-T showing a new or modified connection point in the region is justified.

This trigger event is specific and capable of objective verification, relates to a specific location, and is probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

[13] A copy of this report is available at http://www.dplg.sa.gov.au/plan4adelaide/index.cfm

14.4 Project requirement

The group of connection points that supply the Northern Suburbs are classified as a Category 4 grouped exit point under the ETC. This requires ElectraNet to provide "N-1" equivalent line and transformer capacity for at least 100% of contracted Agreed Maximum Demand (AMD).

Network load flow studies show that with additional residential, commercial and industrial development in the outer northern suburbs of Adelaide and around the townships of Roseworthy and Gawler, major expansion of the 66 kV distribution sub-transmission network is required along with the establishment of a new transmission connection point to supply this load. Inclusion of this project in ElectraNet's revenue proposal is supported by the findings of a DNSP planning report recommending that a new transmission connection point at Kingsford be listed as a contingent project[14].

Both the timing and scope of this project, and therefore the transmission requirements, are uncertain at this point in time.

If the trigger event occurs the proposed contingent project would be reasonably required to meet the Rules capital expenditure objectives to efficiently meet expected demand for prescribed transmission services and to comply with all applicable regulatory obligations associated with the provision of prescribed transmission services.

14.5 Contingent capital expenditure

The proposed contingent project is estimated to cost $48 million.

This estimate is based on the establishment of a new 275/66 kV connection point at Kingsford (near Roseworthy) with two 225 MVA transformers. The scope includes turning the Para to Brinkworth 275 kV circuit in and out of the site, uprating or rebuilding the circuit as a double circuit line from Kingsford back to Para as required, and any associated works to install dual high speed telecommunications services into the site to ensure compliance with all relevant Rules requirements.

The methodology used for developing the forecast cost estimate is described in section 5.8.6 of ElectraNet's Revenue Proposal.

ElectraNet notes that by definition it is generally not possible to accurately define the scope of a proposed contingent project at this early stage. Therefore, the estimated cost of the project is indicative only. A detailed project scope and cost estimate will be required before any amendment to the revenue determination is considered by the AER should the specified trigger event occur during the regulatory period.

The estimated contingent capital expenditure exceeds the applicable contingent project threshold of $14.6 million (see section 5.10 of ElectraNet's Revenue Proposal).

[14] A copy of this report has been made available to the AER on a confidential basis, due to the inclusion of confidential customer information

14.6 Demonstration of rules compliance

ElectraNet considers that this project should be accepted as a contingent project for the forthcoming regulatory control period as it complies with the provisions set down in clause 6A.8.1(b) of the Rules as:

a) it is reasonably required to achieve the capital expenditure objectives as set out in 14.4;

b) it is not otherwise provided for in the total forecast capital expenditure;

c) it reasonably reflects the capital expenditure criteria, noting that the costs are an estimate at this point;

d) it exceeds the contingent project threshold as set out in 14.5;

e) it complies with the requirements of the Submission Guidelines; and

f) it has an appropriately defined trigger event as set out in 14.3.

15. Torrens Island Switchyard Development

15.1 Background

Significant enquiries have been received by ElectraNet relating to the establishment of additional generation capacity in the Le Fevre Peninsula and Torrens Island precincts in the Western Suburbs of Adelaide. The prospects for generation development may be increased by the recent announcement of the retirement of the Playford Power Station and the seasonal operation of the Northern Power Station.

While the current load in the area can be managed on the existing network, additional generation will have limited ability to connect due to the switchyard capacity of the existing Torrens Island switchyards being at capacity with no room for further expansion and cause a significant level of constraints on the 275 kV network in the Western Suburbs due to the current line configuration.

The existing network infrastructure in the area consists of a 275 kV circuit from Torrens Island to Le Fevre and then to Pelican Point and Parafield Gardens West, and terminating at Para. A second 275 kV circuit leads from Torrens Island directly to Para, while a third and a fourth line run from Torrens Island to Magill and Cherry Gardens substations. Two other 275 kV circuits also exit Torrens Island to supply both Northfield and Kilburn. An underground 275 kV cable runs from Torrens Island to the City West substation. Major generation nodes exist on Torrens Island (TIPS A and B) and on the Le Fevre Peninsula (Pelican Point). In addition, embedded generation connected via a 66 kV sub-transmission network is located at Osborne, Quarantine and at Dry Creek.

ETSA Utilities operates a meshed 66 kV sub-transmission system that takes supply from 275/66 kV substations at Torrens Island, Parafield Gardens West, Para, Northfield, Kilburn, City West and Le Fevre.

15.2 Project description

Reconfiguration of the existing 275 kV network in the vicinity of Torrens Island through the establishment of a Torrens Island C switchyard in order to; accommodate further generation to meet load growth, reduce 66 kV fault levels and to allow for future 275 kV augmentation.

ElectraNet considers that the project should be accepted as a contingent project for the regulatory period because of uncertainty about the trigger event occurring and the scope and costs of the project.

15.3 Trigger event

- Successful completion of the RIT-T demonstrating positive net market benefits.

This trigger event is specific and capable of objective verification, relates to a specific location, and is probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

15.4 Project requirement

Because of the configuration of the existing Western suburbs 275 kV supply network, any increase in the level of generation connected in the Le Fevre Peninsula and Torrens Island precincts will significantly exacerbate the network constraints presently experienced by the existing generation particularly that connected in the Le Fevre Peninsula.

Adding to the complexity of this issue, all new generation in this area will be required to utilise a 275 kV connection as the 66 kV fault level has reached its maximum permissible level. Due to a shortage of available 275 kV line exits in the existing Torrens Island switchyards, the development of the Torrens Island C switchyard is the preferred option to enable reconfiguration of the existing lines to manage 66 kV fault levels, accommodate further generation and allow for future 275 kV exits required by projected load growth such as the second cable to City West.

The magnitude of the market benefit delivered by this project, and therefore the transmission requirements, are uncertain at this point in time.

If the trigger event occurs the proposed contingent project would deliver net market benefits and be reasonably required to meet the Rules capital expenditure objectives to efficiently meet expected demand for prescribed transmission services over the regulatory control period.

15.5 Contingent capital expenditure

The proposed contingent project is estimated to cost $54 million.

This estimate is based on the reconfiguration of the western suburbs transmission network through the establishment of Torrens Island C switchyard. The scope of works will include the construction of some new 275 kV lines on Torrens Island and turning others into the new switchyard.

The methodology used for developing the forecast cost estimate is described in section 5.8.6 of ElectraNet's Revenue Proposal.

ElectraNet notes that by definition it is generally not possible to accurately define the scope of a proposed contingent project at this early stage. Therefore, the estimated cost of the project is indicative only. A detailed project scope and cost estimate will be required before any amendment to the revenue determination is considered by the AER should the specified trigger event occur during the regulatory period.

The estimated contingent capital expenditure exceeds the applicable contingent project threshold of $14.6 million (see section 5.10 of ElectraNet's Revenue Proposal).

15.6 Demonstration of rules compliance

ElectraNet considers that this project should be accepted as a contingent project for the forthcoming regulatory control period as it complies with the provisions set down in clause 6A.8.1(b) of the Rules as:

a) it is reasonably required to achieve the capital expenditure objectives as set out in 15.4;

b) it is not otherwise provided for in the total forecast capital expenditure;

c) it reasonably reflects the capital expenditure criteria, noting that the costs are an estimate at this point;

d) it exceeds the contingent project threshold as set out in 15.5;

e) it complies with the requirements of the Submission Guidelines; and

f) it has an appropriately defined trigger event as set out in 15.3.

16. Mid-North Connection Point

16.1 Background

The load in the Mid-North region is primarily related to industrial, residential and commercial activities, with seasonal primary industry activity (grain handling). State Government mineral resources forecasts[15] indicate that larger scale mining activities have a high probability of occurring in the eastern part of this region towards the Victorian and NSW border, to the north and east of ElectraNet's Belalie substation, which would be supplied from the distribution network. In addition, this region of the network experiences high system losses and limitations are emerging on the underlying 33 kV distribution system operated by ETSA Utilities which are expected to be best addressed by constructing a new transmission connection point.

The existing network infrastructure in the area consists of the double circuit 275 kV lines from Tungkillo to Davenport via Robertstown and two single circuit 275 kV lines from Para to Davenport via Bungama and Brinkworth respectively. Underlying this 275 kV main backbone grid, there are several 132 kV circuits that are supplied from the major 275 kV substations located at Bungama, Brinkworth and Robertstown. A number of wind farms are also located on both the 132 kV and the 275 kV networks throughout the region.

ETSA Utilities operates a widespread 33 kV distribution network that is fed from 132 kV substations at Waterloo, Hummocks, Clare North, Brinkworth, Bungama, Port Pirie and Baroota.

16.2 Project description

Establishment of a new distribution connection point in the Mid-North.

ElectraNet considers that the project should be accepted as a contingent project for the regulatory period because of uncertainty about the trigger event occurring and the scope and costs of the project.

16.3 Trigger event

- Formal request for a new regulated connection point from the DNSP; and
- Successful completion of the RIT-T showing a new connection point in the region is justified.

This trigger event is specific and capable of objective verification, relates to a specific location, and is probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

16.4 Project requirement

Chapter 5 of the Rules requires a TNSP to make an offer of connection to a customer, on application. The ETC requires ElectraNet to submit the applicable standards for a new connection point to ESCOSA for approval. New transmission assets are established in

[15] *Resources and Energy Infrastructure Demand Study*, Resources and Energy Infrastructure Council (RESIC), November 2011

accordance with the definitions of prescribed, negotiated and non-regulated transmission services established under the Rules. The manner in which ElectraNet applies these definitions is outlined in the Grid Australia Categorisation of Transmission Services Guideline[16] with reference to the minimum service requirements of the ETC. The scope of this project is limited to the prescribed transmission assets established in accordance with these requirements.

A step load in the Mid North region to the north and east of Jamestown due to a prospective resource development would cause thermal and voltage limitations on ETSA Utilities' 33 kV distribution network currently supplied from Bungama.

The construction of a transmission connection point on the double circuit 275 kV lines from Robertstown to Davenport to reinforce this network is expected to be the most efficient solution as it avoids significant distribution network development and significantly reduces the current level of network losses. Inclusion of this this project in ElectraNet's revenue proposal is supported by the findings of a DNSP planning report recommending that a new transmission connection point at Jamestown connection point be listed as a contingent project[17].

Both the timing and scope of this project, and therefore the transmission requirements, are uncertain at this point in time.

If the trigger event occurs the proposed contingent project would be reasonably required to meet the Rules capital expenditure objectives to efficiently meet expected demand for prescribed transmission services and to comply with all applicable regulatory obligations associated with the provision of prescribed transmission services.

16.5 Contingent capital expenditure

The proposed contingent project is estimated to cost $59 million.

This estimate is based on establishing a new distribution connection point in the Mid-North region to the north and east of Jamestown with one 225 MVA 275/66 kV transformer connected to the existing Robertstown to Davenport 275 kV lines.

The methodology used for developing the forecast cost estimate is described in section 5.8.6 of ElectraNet's Revenue Proposal.

ElectraNet notes that by definition it is generally not possible to accurately define the scope of a proposed contingent project at this early stage. Therefore, the estimated cost of the project is indicative only. A detailed project scope and cost estimate will be required before any amendment to the revenue determination is considered by the AER should the specified trigger event occur during the regulatory period.

The estimated contingent capital expenditure exceeds the applicable contingent project threshold of $14.6 million (see section 5.10 of ElectraNet's Revenue Proposal).

[16] This Guideline is available at: http://www.gridaustralia.com.au/index.php?option=com_docman&task=doc_download&Itemid=&gid=106

[17] A copy of this report has been made available to the AER on a confidential basis, due to the inclusion of confidential customer information

16.6 Demonstration of rules compliance

ElectraNet considers that this project should be accepted as a contingent project for the forthcoming regulatory control period as it complies with the provisions set down in clause 6A.8.1(b) of the Rules as:

a) it is reasonably required to achieve the capital expenditure objectives as set out in 16.4;

b) it is not otherwise provided for in the total forecast capital expenditure;

c) it reasonably reflects the capital expenditure criteria, noting that the costs are an estimate at this point;

d) it exceeds the contingent project threshold as set out in 16.5;

e) it complies with the requirements of the Submission Guidelines; and

f) it has an appropriately defined trigger event as set out in 16.3.

17. Port Pirie System Reinforcement

17.1 Background

The rate of load increase in the Port Pirie region has been moderate in recent years. However, a step change in demand would result in voltage limitations on the distribution network supplying the area following the loss of a single transmission element, leading to a requirement to augment transmission supply to Port Pirie.

The existing network infrastructure in the area consists of the 275 kV substation at Bungama, which is cut into the Para to Bungama to Davenport 275 kV line. From Bungama 132 kV substation, a single circuit 132 kV line runs to the Port Pirie 132 kV substation which has a single 60 MVA 132/33 kV transformer.

ETSA Utilities operates a meshed 33 kV distribution network to Port Pirie that is supplied by the 132 kV substations at Bungama and Port Pirie.

17.2 Project description

Reinforcement of the Port Pirie connection point and associated line works.

ElectraNet considers that the project should be accepted as a contingent project for the regulatory period because of uncertainty about the trigger event occurring and the scope and costs of the project.

17.3 Trigger event

- Formal request for a new regulated connection point from the DNSP; and
- Successful completion of the RIT-T showing a new connection point in the region is justified.

This trigger event is specific and capable of objective verification, relates to a specific location, and is probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

17.4 Project requirement

Load flow studies conducted by ElectraNet show that there are emerging distribution network limitations in the Port Pirie region due to forecast load growth. Following the loss of the single 60 MVA 132/33 kV transformer at Port Pirie or the radial 132 kV line from Bungama to Port Pirie, the 33 kV distribution network would experience under voltage in the supply area, resulting in voltages below the minimum standards specified in the Rules and potential voltage collapse.

A transmission solution is expected to become economic if the proposed distribution system reinforcement fails to secure development approval for an overhead 33 kV line solution. Inclusion of this project in ElectraNet's revenue proposal is supported by the

findings of a DNSP planning report recommending that reinforcement of the Port Pirie connection point be listed as a contingent project[18].

Both the timing and scope of this project, and therefore the transmission requirements, are uncertain at this point in time.

If the trigger event occurs the proposed contingent project would be reasonably required to meet the Rules capital expenditure objectives to efficiently meet expected demand for prescribed transmission services and to comply with all applicable regulatory obligations associated with the provision of prescribed transmission services.

17.5 Contingent capital expenditure

The proposed contingent project is estimated to cost $36 million.

This estimate is based on the reinforcement of the Port Pirie connection point by installing a second 60 MVA 132/33 kV transformer and constructing a second 132 kV line between Bungama and Port Pirie and associated substation works at each end.

The methodology used for developing the forecast cost estimate is described in section 5.8.6 of ElectraNet's Revenue Proposal.

ElectraNet notes that by definition it is generally not possible to accurately define the scope of a proposed contingent project at this early stage. Therefore, the estimated cost of the project is indicative only. A detailed project scope and cost estimate will be required before any amendment to the revenue determination is considered by the AER should the specified trigger event occur during the regulatory period.

The estimated contingent capital expenditure exceeds the applicable contingent project threshold of $14.6 million (see section 5.10 of ElectraNet's Revenue Proposal).

17.6 Demonstration of rules compliance

ElectraNet considers that this project should be accepted as a contingent project for the forthcoming regulatory control period as it complies with the provisions set down in clause 6A.8.1(b) of the Rules as:

a) it is reasonably required to achieve the capital expenditure objectives as set out in 17.4;

b) it is not otherwise provided for in the total forecast capital expenditure;

c) it reasonably reflects the capital expenditure criteria, noting that the costs are an estimate at this point;

d) it exceeds the contingent project threshold as set out in 17.5;

e) it complies with the requirements of the Submission Guidelines; and

f) it has an appropriately defined trigger event as set out in 17.3.

[18] A copy of this report has been made available to the AER on a confidential basis, due to the inclusion of confidential customer information

18. South East Connection Point Reinforcement

18.1 Background

The rate of load increase in the South East region has been moderate in recent years. However, a step change in demand in the South East would lead to network limitations in the area and result in the requirement to augment the transmission supply to either the area around Tailem Bend or the area around Keith.

The existing network infrastructure in the area consists of the double circuit 275 kV lines from Tailem Bend to South East 275 kV substations and the two 132 kV circuits that lead from Tailem Bend to Keith and from there to South East. One circuit runs via Snuggery, Blanche and Mount Gambier, the other runs via Kincraig and Penola West.

ETSA Utilities operates a widespread 33 kV distribution network that is fed from 132 kV substations at Tailem Bend, Keith, Kincraig, Penola West, Snuggery, Blanche and Mount Gambier.

18.2 Project description

Establishment of a new DNSP 132/33 kV connection point in the South East.

ElectraNet considers that the project should be accepted as a contingent project for the regulatory period because of uncertainty about the trigger event occurring and the scope and costs of the project.

18.3 Trigger event

- Formal request for a new regulated connection point from the DNSP; and
- Successful application of the RIT-T showing a new or modified connection point in the region is justified.

This trigger event is specific and capable of objective verification, relates to a specific location, and is probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

18.4 Project requirement

Chapter 5 of the Rules requires a TNSP to make an offer of connection to a customer, on application. The ETC requires ElectraNet to submit the applicable standards for a new connection point to ESCOSA for approval. New transmission assets are established in accordance with the definitions of prescribed, negotiated and non-regulated transmission services established under the Rules. The manner in which ElectraNet applies these definitions is outlined in the Grid Australia Categorisation of Transmission Services Guideline[19] with regard to the minimum service requirements of the ETC. The scope of this project is limited to the prescribed transmission assets established in accordance with these requirements.

[19] This Guideline is available at: http://www.gridaustralia.com.au/index.php?option=com_docman&task=doc_download&Itemid=&gid=106

Load flow studies conducted by ElectraNet show that there are emerging connection point limitations at several locations in the South East region due to forecast load growth. Consequently, unplanned transformer outages at these sites will result in connection point voltages below the minimum standards specified in the Rules.

The result of this is that voltage limitations, with the potential for voltage collapse, are being experienced on the underlying 33 kV distribution networks supplying the widespread, rural load centres that characterise this area.

To address the 132/33 kV transformation capacity limitation, further transmission injection into the distribution network will be required, which will also address the voltage limitations on the 33 kV network. Inclusion of this project in ElectraNet's revenue proposal is supported by the findings of a DNSP planning report recommending that new Coonalpyn West, Mount Benson and Sugar Loaf Hill connection points be listed as a contingent project[20].

Both the timing and scope of this project, and therefore the transmission requirements, are uncertain at this point in time.

If the trigger event occurs the proposed contingent project would be reasonably required to meet the Rules capital expenditure objectives to efficiently meet expected demand for prescribed transmission services, comply with all applicable regulatory obligations associated with the provision of prescribed transmission services and maintain the quality, reliability and security of supply of prescribed services.

18.5 Contingent capital expenditure

The proposed contingent project is estimated to cost $25 million.

This estimate is based on the establishment of a new 132/33 kV connection point in the South East region at Coonalpyn West with two 25 MVA 132/33 kV transformers connected to the existing Tailem Bend to Keith #2 line. The location of this connection point will depend on distribution network requirements.

The methodology used for developing the forecast cost estimate is described in section 5.8.6 of ElectraNet's Revenue Proposal.

ElectraNet notes that by definition it is generally not possible to accurately define the scope of a proposed contingent project at this early stage. Therefore, the estimated cost of the project is indicative only. A detailed project scope and cost estimate will be required before any amendment to the revenue determination is considered by the AER should the specified trigger event occur during the regulatory period.

The estimated contingent capital expenditure exceeds the applicable contingent project threshold of $14.6 million (see section 5.10 of ElectraNet's Revenue Proposal).

[20] A copy of this report has been made available to the AER on a confidential basis, due to the inclusion of confidential customer information

18.6 Demonstration of rules compliance

ElectraNet considers that this project should be accepted as a contingent project for the forthcoming regulatory control period as it complies with the provisions set down in clause 6A.8.1(b) of the Rules as:

a) it is reasonably required to achieve the capital expenditure objectives as set out in 18.4;

b) it is not otherwise provided for in the total forecast capital expenditure;

c) it reasonably reflects the capital expenditure criteria, noting that the costs are an estimate at this point;

d) it exceeds the contingent project threshold as set out in 18.5;

e) it complies with the requirements of the Submission Guidelines; and

f) it has an appropriately defined trigger event as set out in 18.3.

19. South East Region Augmentation

19.1 Background

While the rate of load increase in the Upper South East region has been moderate in recent years, a small incremental increase in load at the Penola West, Kincraig or Keith connection points in this region would result in voltage limitations on the network and lead to a requirement to augment transformer capacity to the area around Kincraig.

The existing network infrastructure in the area consists of the double circuit 275 kV lines from Tailem Bend to South East substations and the two 132 kV circuits that lead from Tailem Bend to Keith and from there to South East. One circuit runs via Snuggery, Blanche and Mount Gambier, the other runs via Kincraig and Penola West.

ElectraNet is currently evaluating the de-commissioning of the second 132 kV circuit from Tailem Bend to Snuggery via Keith as part of the South East to Heywood Interconnection Upgrade due to the adverse effect that it has on interconnector flows.

ETSA Utilities operates a widespread 33 kV distribution network that is fed from 132 kV substations at Tailem Bend, Keith, Kincraig, Penola West, Snuggery, Blanche and Mount Gambier.

19.2 Project description

Augmentation of 275/132 kV transformer capacity in the South East region by establishing a 275/132 kV substation at Kincraig and associated 132 kV line reconfiguration as required.

ElectraNet considers that the project should be accepted as a contingent project for the regulatory period because of uncertainty about the trigger event occurring and the scope and costs of the project.

19.3 Trigger event

- An increase in the forecast demand exceeding the forecast published in the 2011 APR for 2018-19 by 4 MW at Keith, 3 MW at Kincraig or 3 MW at Penola West connection points; and
- Successful application of the RIT-T showing a new or modified connection point is justified.

This trigger event is specific and capable of objective verification, relates to a specific location, and is probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

19.4 Project requirement

Load flow studies conducted by ElectraNet show that there are emerging voltage limitations at the Penola West, Kincraig and Keith 132 kV connection points. By 2021, loss of South East to Penola West 132 kV circuit at peak load in the region will result in voltages below the minimum standards specified in the Rules and voltage collapse at

those connection points as all load from Tailem Bend down to the Coonawarra is now being supplied via a radial 132 kV circuit from Tailem Bend via Keith.

A load increase of just 3 MW at the Penola West and Kincraig connection points or of 4 MW at the Keith connection point will advance this requirement for transmission system augmentation into the forthcoming Regulatory Period.

Both the timing and scope of this project, and therefore the transmission requirements, are uncertain at this point in time.

If the trigger event occurs the proposed contingent project would be reasonably required to meet the Rules capital expenditure objectives to efficiently meet expected demand for prescribed transmission services, comply with all applicable regulatory obligations associated with the provision of prescribed transmission services and maintain the quality, reliability and security of supply of prescribed services.

19.5 Contingent capital expenditure

The proposed contingent project is estimated to cost $28 million.

This estimate is based on the establishment of a new transmission connection point at Kincraig with one 200 MVA 275/132 kV transformer and associated 132 kV network reconfiguration.

The methodology used for developing the forecast cost estimate is described in section 5.8.6 of ElectraNet's Revenue Proposal.

ElectraNet notes that by definition it is generally not possible to accurately define the scope of a proposed contingent project at this early stage. Therefore, the estimated cost of the project is indicative only. A detailed project scope and cost estimate will be required before any amendment to the revenue determination is considered by the AER should the specified trigger event occur during the regulatory period.

The estimated contingent capital expenditure exceeds the applicable contingent project threshold of $14.6 million (see section 5.10 of ElectraNet's Revenue Proposal).

19.6 Demonstration of rules compliance

ElectraNet considers that this project should be accepted as a contingent project for the forthcoming regulatory control period as it complies with the provisions set down in clause 6A.8.1(b) of the Rules as:

a) it is reasonably required to achieve the capital expenditure objectives as set out in 19.4;

b) it is not otherwise provided for in the total forecast capital expenditure;

c) it reasonably reflects the capital expenditure criteria, noting that the costs are an estimate at this point;

d) it exceeds the contingent project threshold as set out in 19.5;

e) it complies with the requirements of the Submission Guidelines; and

f) it has an appropriately defined trigger event as set out in 19.3.

20. Lower South East Region Transformer Reinforcement

20.1 Background

While the rate of load increase in the South East region has been moderate in recent years, a moderate step increase in load at either the Snuggery, Blanche or Mount Gambier connection points would result in voltage limitations on the network and a requirement to augment transformer capacity in the area.

The existing network infrastructure in the area consists of the double circuit 275 kV lines from Tailem Bend to South East 275 kV substations and the two 132 kV circuits that lead from Tailem Bend to Keith and from there to South East. One circuit runs via Snuggery, Blanche and Mount Gambier, the other runs via Kincraig and Penola West.

ETSA Utilities operates a widespread 33 kV distribution network that is fed from 132 kV substations at Tailem Bend, Keith, Kincraig, Penola West, Snuggery, Blanche and Mount Gambier.

20.2 Project description

Augmentation of 275/132 kV transformer capacity at South East substation.

ElectraNet considers that the project should be accepted as a contingent project for the regulatory period because of uncertainty about the trigger event occurring and the scope and costs of the project.

20.3 Trigger event

- An increase in the forecast demand exceeding the forecast published in the 2011 APR for 2018-19 by 25 MW for the aggregate of the Snuggery, Blanche and Mount Gambier connection points; and
- Successful application of the RIT-T showing a new or modified connection point is justified.

This trigger event is specific and capable of objective verification, relates to a specific location, and is probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

20.4 Project requirement

Load flow studies conducted by ElectraNet show that there is an emerging thermal limitation on the 275/132 kV transformer capacity in the Lower South East region. By 2021, the loss of a single 160 MVA 275/132 kV transformer at South East at peak load in the region would overload the remaining unit and result in voltages below the minimum standards specified in the Rules in the supply area based on forecast demand growth.

This analysis assumes use of the existing South East to Penola West 132 kV line sever control system (this scheme detects loss of one of the transformers at South East and automatically opens the South East to Penola West 132 kV circuit to prevent load to the north of South East being fed from the remaining transformer) and also accounts for recent the reduction of customer load at Snuggery to 27.5 MW.

An aggregate load increase of 25 MW at the Mount Gambier, Blanche and Snuggery connection points will advance this requirement for transmission system augmentation into the forthcoming Regulatory Period.

Both the timing and scope of this project, and therefore the transmission requirements, are uncertain at this point in time.

If the trigger event occurs the proposed contingent project would be reasonably required to meet the Rules capital expenditure objectives to efficiently meet expected demand for prescribed transmission services, comply with all applicable regulatory obligations associated with the provision of prescribed transmission services and maintain the quality, reliability and security of supply of prescribed services.

20.5 Contingent capital expenditure

The proposed contingent project is estimated to cost $19 million.

This estimate is based on the installation of a third 160 MVA 275/132 kV transformer at South East and associated substation works.

The methodology used for developing the forecast cost estimate is described in section 5.8.6 of ElectraNet's Revenue Proposal.

ElectraNet notes that by definition it is generally not possible to accurately define the scope of a proposed contingent project at this early stage. Therefore, the estimated cost of the project is indicative only. A detailed project scope and cost estimate will be required before any amendment to the revenue determination is considered by the AER should the specified trigger event occur during the regulatory period.

The estimated contingent capital expenditure exceeds the applicable contingent project threshold of $14.6 million (see section 5.10 of ElectraNet's Revenue Proposal).

20.6 Demonstration of rules compliance

ElectraNet considers that this project should be accepted as a contingent project for the forthcoming regulatory control period as it complies with the provisions set down in clause 6A.8.1(b) of the Rules as:

a) it is reasonably required to achieve the capital expenditure objectives as set out in 20.4;

b) it is not otherwise provided for in the total forecast capital expenditure;

c) it reasonably reflects the capital expenditure criteria, noting that the costs are an estimate at this point;

d) it exceeds the contingent project threshold as set out in 20.5;

e) it complies with the requirements of the Submission Guidelines; and

f) it has an appropriately defined trigger event as set out in 20.3.

21. Upper North Region Line Reinforcement

21.1 Background

The rate of load increase in the Upper North region has been moderate in recent years. However, there is growing interest in mineral exploration and resource development in this area. While the current load in the can be managed on the existing network, additional load to the north of Davenport will introduce thermal limitations on the network. A rebuild of either of the circuits will be required in response to any material load increase as uprating is not considered feasible due to the condition of the lines.

The existing network infrastructure in the area consists of a radial 275 kV circuit (owned by BHPB) from Davenport to Olympic Dam West along with a radial 132 kV line from Davenport to Leigh Creek via Neuroodla and another radial 132 kV line from Davenport to Pimba via Mount Gunson. From Pimba, BHPB also owns a radial 132 kV circuit that terminates at Olympic Dam North and there is also a short radial line supplying Woomera.

There are limited distribution assets in this region, with most of the 33 kV distribution network supplied from Davenport 132 kV substation and small 33 kV networks also connected to Mount Gunson and Neuroodla 132 kV substations.

21.2 Project description

Rebuilding of the Leigh Creek or Pimba 132 kV sub-transmission lines and establishment of associated substation assets.

ElectraNet considers that the project should be accepted as a contingent project for the regulatory period because of uncertainty about the trigger event occurring and the scope and costs of the project.

21.3 Trigger event

- Customer commitment to connect and/or an increase in forecast demand of 10 MW above the forecast published in the 2011 APR for 2018-19 at a distance of more than 10 km from Davenport; and
- Successful application of the RIT-T showing a new connection point and line upgrade is justified.

This trigger event is specific and capable of objective verification, relates to a specific location, and is probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

21.4 Project requirement

The existing Davenport to Leigh Creek and Davenport to Pimba 132 kV sub-transmission lines were both designed with a thermal rating of 49 °C (120 °F), which has been shown to be inadequate for Australian summer conditions. Most circuits designed and built to this standard have been uprated or replaced however, the Davenport to Leigh Creek circuit continues to have marginally adequate rating for the magnitude of the load it supplies at the Leigh Creek coal mine and township, and consequently uprating or replacement has

not been necessary to date. The Davenport to Pimba circuit has been partially uprated to improve thermal performance.

Following a condition assessment of both of these circuits, thermally uprating to a higher operating temperature is not considered to be technically viable. As a consequence, any step load increase along either line towards Leigh Creek or Pimba will require the rebuild of that circuit.

Both the timing and scope of this project, and therefore the transmission requirements, are uncertain at this point in time.

If the trigger event occurs the proposed contingent project would be reasonably required to meet the Rules capital expenditure objectives to efficiently meet expected demand for prescribed transmission services and to comply with all applicable regulatory obligations associated with the provision of prescribed transmission services.

21.5 Contingent capital expenditure

The proposed contingent project is estimated to cost $62 million.

This estimate is based on the rebuilding of 10 km of the Davenport to Leigh Creek line as a double circuit and the establishment of a 132/33 kV substation with two 25 MVA transformers. The scope includes associated integration, telecommunication SCADA and metering works.

The methodology used for developing the forecast cost estimate is described in section 5.8.6 of ElectraNet's Revenue Proposal.

ElectraNet notes that by definition it is generally not possible to accurately define the scope of a proposed contingent project at this early stage. Therefore, the estimated cost of the project is indicative only. A detailed project scope and cost estimate will be required before any amendment to the revenue determination is considered by the AER should the specified trigger event occur during the regulatory period.

The estimated contingent capital expenditure exceeds the applicable contingent project threshold of $14.6 million (see section 5.10 of ElectraNet's Revenue Proposal).

21.6 Demonstration of rules compliance

ElectraNet considers that this project should be accepted as a contingent project for the forthcoming regulatory control period as it complies with the provisions set down in clause 6A.8.1(b) of the Rules as:

a) it is reasonably required to achieve the capital expenditure objectives as set out in 21.4;

b) it is not otherwise provided for in the total forecast capital expenditure;

c) it reasonably reflects the capital expenditure criteria, noting that the costs are an estimate at this point;

d) it exceeds the contingent project threshold as set out in 21.5;

e) it complies with the requirements of the Submission Guidelines; and

f) it has an appropriately defined trigger event as set out in 21.3.