ElectraNet Transmission Network Revised Revenue Proposal

Appendix M Revised Contingent Project Summaries

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1. Lower Eyre Peninsula Reinforcement

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 RESIC highlighted the positive economic outlook in the longer term and prospect of significant new mining loads requiring connection to the transmission network[1] to which the Government has responded with a detailed plan for the development of infrastructure to support resource development in the region, including electricity infrastructure.[2]

Following the works presently under way to reconfigure the 132 kV network around Cultana and the construction of the Whyalla Central substation, the existing network infrastructure in the area will consist of a double circuit 275 kV line from Davenport to Cultana and two single circuit 132 kV lines from Cultana to Whyalla Central 132 kV substation. In addition, radial 132 kV circuits will lead from Cultana to Stony Point, from Whyalla Central to Whyalla Terminal and from Cultana to Yadnarie and then to Port Lincoln 132 kV substations. A further 132 kV radial line runs west from Yadnarie to the Wudinna 132 kV substation.

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

At Port Lincoln, a diesel fired gas turbine power station is 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

Reinforcement of the Eyre Peninsula network south of Cultana by constructing a double circuit 275 kV line from Cultana to Yadnarie (and to Port Lincoln if required) together with associated substation works and reactive plant, 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 cost of the project.

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

2 *South Australian Government response to the RESIC recommendations: Directions Statement*, December 2012, http://www.pir.sa.gov.au/__data/assets/pdf_file/0009/179352/2012_RESIC_Directions_Statement_booklet.pdf.

1.3 Trigger Event

- Customer commitment to a step load increase exceeding 50 MW on the transmission network south of Cultana substation, causing the Middleback to Yadnarie 132 kV sub-transmission line to exceed its summer thermal limit (73 MVA)

- Successful completion of the regulatory investment test for transmission including a comprehensive assessment of credible options showing a transmission investment is justified

- ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules

The triggers are specific and capable of objective verification, relate to a specific location, and probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

1.4 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 per cent 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 of 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 ETC limitations are being driven by load increases on the Peninsula caused both 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 and for network capacity to the Lower Eyre Peninsula, ElectraNet has commenced the RIT-T process with the publication of a Project Specification Consultation Report in January 2012.[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.

[3] *Lower Eyre Peninsula Reinforcement RIT-T Project Assessment Draft Report*, January 2013, ElectraNet, http://www.electranet.com.au/network/current-planned-developments/eyre-peninsula/new-developmentpage-8/rcview/.

1.5 Contingent Capital Expenditure

The proposed contingent project is estimated to cost $340 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 Yadnarie together with associated substation works.

If required, this project will also cover the scope of works that is required to extend this double circuit 275 kV line from Yadnarie to Port Lincoln, replace the Port Lincoln 132 kV section and the installation of associated reactive plant in the region for dynamic voltage control (should it be deemed to be required).

The methodology used for developing the forecast cost estimate was 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 $13.7 million.[4]

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.

[4] This represents 5 per cent of the MAR for the first year of the regulatory control period. Refer Chapter 12.

2. Riverland Reinforcement

2.1 Background

The load in the Riverland region is primarily related to irrigated agricultural (citrus, grapes, wheat, livestock, etc.), residential and commercial activities centred on the towns of Berri, Barmera, Loxton, Waikerie, Morgan and Renmark. It is anticipated that a major network augmentation will be required in the region due to load growth in both South Australia and also Victoria. In particular, this inter-regional load growth affects the capacity of the Murraylink interconnector from Red Cliffs 220 kV substation in Victoria to transfer power to Monash 132 kV substation in South Australia at times of peak load.

The existing network infrastructure in the area consists of two 132 kV lines from Robertstown to North West Bend to Monash, a 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 the North West Bend, Monash and Berri 132 kV substations.

2.2 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.

2.3 Trigger Event

- Publication by AEMO of available Murraylink dispatch into South Australia that is insufficient to provide adequate support to the Riverland causing thermal limitations on the Robertstown to Berri 132 kV sub-transmission lines

- Successful completion of the regulatory investment test for transmission including a comprehensive assessment of credible options demonstrating that reinforcement of the Riverland is justified

- ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules

The triggers are specific and capable of objective verification, relate to a specific location or locations, and are probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

2.4 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 per cent of contracted Agreed Maximum Demand (AMD).

Loading in western Victoria places a limit on the available Murraylink interconnector transfer into South Australia. With current loads in western Victorian, the available transfer into South Australia from Victoria at times of peak loading is greatly reduced. The Riverland loads currently rely on some power transfer through Murraylink from Victoria to meet the maximum demand in the region. Load flow modelling of the Riverland 132 kV network shows that this ongoing decline in Murraylink transfer capability due to continued western Victoria load growth will ultimately lead to an overload of the North West Bend to Monash #1 132 kV circuit and an under voltage at Monash 132 kV substation 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 Monash 132 kV substation 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. Further, AEMO has also published a second PSCR investigating the reinforcement options available for another constraint on the 220 kV network in north western Victoria. It is anticipated that if successful, these investigations will result in several projects in north western Victoria that will ensure Murraylink has sufficient capacity to export to South Australia when required. This will allow the operation of this interconnector in export mode until the point where loss of Murraylink exceeds the combined thermal capacity of the two 132 kV lines supplying the Riverland. Should sufficient transfer capacity on Murraylink become unavailable, major augmentation of the Riverland 132 kV network will then be required to meet projected demand and 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.

2.5 Contingent Capital Expenditure

The proposed contingent project is estimated to cost $400 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 complete removal of all ElectraNet 132 kV assets from Berri.

The methodology used for developing the forecast cost estimate was 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 $13.7 million.[5]

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;

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 2.5;

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

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

[5] This represents 5 per cent of the MAR for the first year of the regulatory control period. Refer Chapter 12.

3. Fleurieu Peninsula Reinforcement

3.1 Background

The load in the Fleurieu Peninsula region is primarily agricultural (intensive irrigated fruit and vegetables, beef, dairy, vineyards, etc.) with a concentration of residential and commercial activities centred primarily on the towns of Victor Harbor and Goolwa, with a number of smaller town centres such as Normanville, Port Elliot, Middleton and Yankalilla as well. 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. This is particularly the case with the towns of Victor Harbor, Port Elliot, Middleton and Goolwa on the eastern side of the Peninsula.

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, SA Power Networks 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.

3.2 Project Description

Construction of a double circuit 275 kV transmission line to extend the existing transmission network from a new Kanmantoo North 275 kV switching station to a point near Currency Creek and establishing a new 275/66 kV Category 4 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 cost of the project.

3.3 Trigger Event

- Load growth in the distribution system in the Fleurieu Peninsula region that causes the total load on the Willunga to Square Water Hole 66 kV sub-transmission line to exceed its thermal limit (72 MVA)
- Successful completion of the regulatory test by the DNSP including a comprehensive assessment of credible options showing a transmission solution is economically justified
- Formal request for a new regulated connection point from the DNSP
- ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules

The triggers are specific and capable of objective verification, relate to a specific location or locations, and are probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

3.4 Project Requirement

SA Power Networks is currently performing the Regulatory Test to address emerging network limitations on the Fleurieu Peninsula. Additional load growth on the Fleurieu Peninsula will lead to thermal and voltage limitations on the 66 kV sub-transmission lines supplying the major load centres on the Peninsula. Following the expected implementation of a non-network solution followed by a distribution solution, the capacity of the distribution system following the deployment of these solutions is expected to be exceeded by around 2025. Any unexpected demand increase above the current demand forecasts and/or failure of the non-network solution as a technically and economically viable option will advance the need for this development, potentially to within the next regulatory control period.

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.

3.5 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 was 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 $13.7 million.[7]

[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.

[7] This represents 5 per cent of the MAR for the first year of the regulatory control period. Refer Chapter 12.

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. Yorke Peninsula Reinforcement

4.1 Background

The load in the Yorke Peninsula region is primarily related to small scale mining, residential and commercial activities, with seasonal primary industry activity (grain handling) and is heavily influenced by seasonal tourism activity. 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, wind farm and 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. ElectraNet has also received an enquiry from a wind farm developer for a 199 turbine, 600 MW wind farm, with the development application recently being lodged with the State government.[8]

ElectraNet is also currently responding to a connection enquiry with a potential mining load expected to be in excess of 70 MW. A step load increase of this magnitude will severely overload ElectraNet's 132 kV network that feeds Hummocks.

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, each with a thermal capacity of 105 MVA. 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.

4.2 Project Description

Construction of a new double circuit 275 kV transmission line (cut into the existing Para to Bungama 275 kV circuit at Blyth West) and establishment of a 275/132 kV substation at Hummocks, replacing the 132 kV section 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 cost of the project.

8 Julian Swallow, 08/01/2013, "$1.3 billion Ceres wind farm project divides Yorke Peninsula towns", Accessed 01/08/2013, http://www.adelaidenow.com.au/bn-ceres-wind-farm-project-divides-yorke-peninsula-town/story-e6frea6u-1226549828936.

4.3 Trigger Event

- Customer commitment to a step load increase exceeding 60 MW on the transmission network south of Ardrossan West substation, causing the Bungama to Snowtown to Hummocks sub-132 kV transmission line to exceed its thermal limit (105 MVA) on loss of the Waterloo to Hummocks 132 kV sub-transmission line (and vice versa)

- Successful completion of the regulatory investment test for transmission including a comprehensive assessment of credible options showing that reinforcement of the transmission network supplying Hummocks is justified

- ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules

The triggers are specific and capable of objective verification, relate to a specific location or locations, and are probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

4.4 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. In addition, it should be noted that voltage stability of the system is unlikely to be maintained following the contingency, leading to voltage collapse and loss of load. These system limitations may be efficiently resolved by the construction of a new transmission injection point and associated line works.

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.

4.5 Contingent Capital Expenditure

The proposed contingent project is estimated to cost $190 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 was 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 $13.7 million.[9]

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.

[9] This represents 5 per cent of the MAR for the first year of the regulatory control period. Refer Chapter 12.

5. South East to Heywood Interconnection Upgrade

5.1 Background

Increasing network constraints on intra and inter-regional power transfers are being experienced in the South East. These limitations are due primarily to the growth of renewable generation in the Mid North and the increased export and import requirements that result. In addition, the loading of transmission assets in the South East (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. SA Power Networks 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.

5.2 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 cost of the project.

5.3 Trigger Event

- Successful completion of the regulatory investment test for transmission demonstrating positive net market benefits
- Determination by the AER under clause 5.6.6AA that the proposed investment satisfies the regulatory investment test for transmission
- ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules

The triggers are specific and capable of objective verification, relate to a specific location or locations, and are probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

5.4 Project Requirement

With the existing levels of generation and load, intra and inter-regional transfer limitations are currently 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 Project Assessment Conclusions Report on 9 January 2013.[10] 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.

5.5 Contingent Capital Expenditure

The proposed contingent project is estimated to cost $63 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 50 per cent series compensation at Black Range and decommissioning the Snuggery to Keith and the Keith to Tailem Bend #1 132 kV circuits.

Additional costs will be occurred in the Victorian network expected to involve the installation of a 3rd 370 MVA 500/275 kV transformer at Heywood.

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

ElectraNet notes that while the scope of this proposed contingent project is now well known, detailed estimation work is yet to be carried out. 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 $13.7 million.[11]

[10] *South Australia - Victoria (Heywood) Interconnector Upgrade RIT-T: Project Assessment Conclusions Report*, January 2013, AEMO & ElectraNet, http://www.electranet.com.au/assets/Uploads/Heywood-PACR.pdf.

[11] This represents 5 per cent of the MAR for the first year of the regulatory control period. Refer Chapter 12.

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. Davenport Reactive Support

6.1 Background

Recent dynamic studies of the South Australian power system at load levels above 2800 MW have revealed that with no generation from Playford 'B' or Northern Power Stations, there is a significant power transfer constraint between Adelaide (where all of the State's generation now must be transferred from) and the major industrial and mining loads supplied from Davenport.

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. If this single unit were to lose synchronism at times of high State demand, a number of voltage control and quality of supply issues would then be revealed in the Eyre Peninsula, Upper North and Mid North regions. The level of constraint increases significantly over the winter months (the highest output period for wind generators) with the current policy of shutting Northern Power Station operations down over the winter months and the semi-retirement of the Playford 'B' Power Station.

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 conduit for 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.

SA Power Networks 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.

6.2 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 cost of the project.

6.3 Trigger Event

- Commitment to the temporary or permanent closure of the Playford and Northern Power Stations during the South Australian summer period
- Successful completion of the regulatory investment test for transmission including a comprehensive assessment of credible options showing installation of additional reactive support at Davenport is justified

- ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules

The triggers are specific and capable of objective verification, relate to a specific location, and are probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

6.4 Project Requirement

Additional load growth is anticipated in both the Eyre Peninsula and the Upper North regions of the State. In combination with this, the recent adoption of a policy by the owners to only run the Northern Power Station over the summer period and the effective retirement of the Playford 'B' Power Station has a high potential to cause numerous network issues under a variety of credible network operating conditions.

With total system loads above 2800 MW and no generation at Port Augusta, there is a significant load transfer constraint between the generation source (Adelaide and the interconnection with Victoria) and the major industrial and mining customers at and to the north of Davenport. Following the loss of a single unit in operation at Northern Power Station at times of maximum State wide demand, voltage control and quality of supply issues emerge in the region. These issues may have a significant impact on ElectraNet's ability to continue to supply load in this region in a safe and reliable manner.

In addition to this, the level of network congestion seen by the Eyre Peninsula and Mid North wind generators is significantly higher than it was in the past since Northern Power Station shut down its operations over the winter months (the highest output period for the wind farms) and Playford Power Station has been semi-retired. This is due to the lack of any other synchronous 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.

6.5 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 generator 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 was 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 $13.7 million.[12]

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.

[12] This represents 5 per cent of the MAR for the first year of the regulatory control period. Refer Chapter 12.

7. Upper South East Network Augmentation

7.1 Background

Increasing network constraints on intra and inter-regional power transfers are being experienced in the South East. These limitations are due primarily to the growth of renewable generation in the Mid North and the increased export and import requirements that result. In addition, the loading of transmission assets in the South East (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.

While the current load/generation balance in the South East can be managed on the existing network, additional import/export or 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, Cherry Gardens, Mannum, Mobilong and Mount Barker 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.

SA Power Networks 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.

7.2 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.

7.3 Trigger Event

- Publication by AEMO of evidence of material constraints in the upper south east region of the transmission network
- Successful completion of the regulatory investment test for transmission demonstrating positive net market benefits
- Determination by the AER under clause 5.6.6AA that the proposed investment satisfies the regulatory investment test for transmission

- ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules

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.

7.4 Project Requirement

Thermal limitations would exist on both the transfer of power from the interconnector with Victoria (both import and export) and a generator to the major load centres in the State. Work conducted for the Heywood to South East Interconnector Upgrade has shown that in future years, there is a significant upsurge in network constraints on the Tailem Bend to Tungkillo to Para 275 kV lines.

These constraints are associated with the increase in the transfer capacity between South Australia and Victoria and the ongoing augmentation of generation capacity resulting from the opportunities this network project presents. 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.

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.

7.5 Contingent Capital Expenditure

The proposed contingent project is estimated to cost $50 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 was 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 $13.7 million.[13]

[13] This represents 5 per cent of the MAR for the first year of the regulatory control period. Refer Chapter 12.

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. Northern Suburbs Reinforcement

8.1 Background

The State Government's 30 Year Plan for Greater Adelaide[14] 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 from 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 275/66 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.

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

8.2 Project Description

Establish a 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.

8.3 Trigger Event

- Load growth in the distribution system in the northern suburbs region that causes:

    a. the total load on the Para to Elizabeth Heights 66 kV sub-transmission line to exceed its thermal rating (137 MVA) for an outage of the Munno Para 275/66 kV transformer; OR

    b. the need to de-radialise supply to Gawler East arises

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

- Successful completion of the regulatory test or regulatory investment test for transmission (as applicable) including a comprehensive assessment of credible options demonstrating that a new or modified transmission connection point in the region is economically justified

- Formal request for a new regulated connection point from the DNSP

- ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules

The triggers are specific and capable of objective verification, relate to a specific location, and are probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

8.4 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 per cent 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.[15]

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.

8.5 Contingent Capital Expenditure

The proposed contingent project is estimated to cost $50 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 Templers West 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.

[15] 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 was 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 $13.7 million.[16]

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.

[16] This represents 5 per cent of the MAR for the first year of the regulatory control period. Refer Chapter 12.

9. Mid North Connection Point

9.1 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[17] 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 SA Power Networks 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.

SA Power Networks 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.

9.2 Project Description

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

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

- Addition of a step load to the distribution system, in the upper north east of the mid-north region that causes the total load on the Bungama to Gladstone 33 kV sub-transmission line to exceed 14 MVA and causing voltage limitations in the distribution network

- Successful completion of the regulatory test or regulatory investment test for transmission (as applicable), including a comprehensive assessment of credible options demonstrating that a transmission reinforcement in the region is economically justified

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

- Formal request for a new regulated connection point from the DNSP
- ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules

The triggers are specific and capable of objective verification, relate to a specific location, and are 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[18] 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 SA Power Networks' 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, widespread 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.[19]

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.

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

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

9.5 Contingent Capital Expenditure

The proposed contingent project is estimated to cost $60 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 was 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 $13.7 million.[20]

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.

[20] This represents 5 per cent of the MAR for the first year of the regulatory control period. Refer Chapter 12.

10. Port Pirie System Reinforcement

10.1 Background

The load on the Port Pirie system is primarily related to heavy industrial processes and also residential and commercial activities, with seasonal primary industry activity (grain handling). While the rate of load increase in the Port Pirie region has been moderate in recent years, a step change in demand would result in thermal limitations on the 33 kV distribution network supplying the area. The thermal limit would arise following the loss of either the Bungama to Port Pirie 132 kV line or the Port Pirie 132/33 kV transformer and lead to the requirement to augment transmission supply to Port Pirie. In addition to this, the loss of the single Bungama 275/132 kV transformer would result in voltage limitations at the connection points at Bungama, Port Pirie, and Baroota, and on the Yorke Peninsula (Ardrossan West, Dalrymple, Kadina East, and Hummocks).

The existing network infrastructure in the area consists of the 275 kV substation at Bungama with a single 200 MVA 275/132 kV transformer, 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.

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

10.2 Project Description

Reinforcement of the 132 kV Port Pirie connection point and associated line works and the reinforcement of the 275 kV supply into Bungama.

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

- Addition of a step load in the Port Pirie area that causes:

    a. the total load on the Bungama to Port Pirie 33 kV sub-transmission lines to exceed their thermal rating (84 MVA) for an outage of the Bungama to Port Pirie 132 kV transmission line or Port Pirie 132/33 kV transformer; OR

    b. the total load on the grouped Bungama to Port Pirie connection points exceeding 93 MVA causing low voltage at Bungama for the loss of the single 200 MVA 275/132 kV transformer.

- Successful completion of the regulatory test or regulatory investment test for transmission (as applicable), including a comprehensive assessment of credible options demonstrating that a transmission reinforcement in the region is economically justified

- Formal request for an expanded regulated connection point from the DNSP
- ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules

The triggers are specific and capable of objective verification, relate to a specific location, and are probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

10.4 Project Requirement

Load flow studies conducted by ElectraNet show that there are emerging distribution network limitations in the Port Pirie region. 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, an increased load at Port Pirie would cause the 33 kV distribution network to experience thermal overload 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 be the most efficient option based on the relative costs of reinforcing the distribution system and undertaking a transmission network augmentation. 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.[21]

Load flow studies conducted by ElectraNet also show that there are emerging low voltage levels at Bungama, Port Pirie, Baroota, Hummocks, Ardrossan West, Dalrymple, and Kadina East connection points following the loss of the Bungama 275/132 kV transformer. These emerging limitations were canvassed in a PSCR published in August 2012. Based on the 10 per cent PoE load forecast developed for this revised Revenue Proposal , the limitation is now forecast to emerge in summer 2024/25. However, a step load increase could advance the emergence of the forecast limitation.

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.

10.5 Contingent Capital Expenditure

The proposed contingent project is estimated to cost $52 million.

This estimate is based on the installation of a second 200 MVA 275/132 kV transformer at Bungama and 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.

[21] 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 was 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 $13.7 million.[22]

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.

[22] This represents 5 per cent of the MAR for the first year of the regulatory control period. Refer Chapter 12.

11. Upper North Region Line Reinforcement

11.1 Background

The load in the Upper North region is primarily related to mining and heavy industrial activity with some residential, commercial and pastoral load making up the balance. 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.

11.2 Project Description

Rebuilding of a section of the Davenport to Pimba 132 kV sub-transmission line 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.

11.3 Trigger Event

- Customer commitment to connect a step load along the Davenport to Pimba 132 kV sub-transmission line that causes the total load to exceed 76 MW causing thermal limitations on the network

- Completion of the regulatory investment test for transmission including a comprehensive assessment of credible options demonstrating that reinforcement of the transmission line is justified

- ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules

The triggers are specific and capable of objective verification, relate to a specific location, and are probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

11.4 Project Requirement

The existing Davenport to Pimba 132 kV sub-transmission line was originally 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 in South Australia have been uprated or replaced; however, the Davenport to Pimba circuit has only been partially uprated by lifting one phase to improve its thermal performance.

Following a condition assessment of this circuit, 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 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.

11.5 Contingent Capital Expenditure

The proposed contingent project is estimated to cost $60 million.

This estimate is based on the rebuilding of a minimum of 10 km of the Davenport to Pimba 132 kV 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 was 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 $13.7 million.[23]

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;

[23] This represents 5 per cent of the MAR for the first year of the regulatory control period. Refer Chapter 12.

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. East Terrace Transformer

12.1 Background

The load in the Adelaide Central Region (ACR) is primarily related to commercial activities, with high density residential load increasing quite rapidly, driving a high summer air-conditioning load. The State Government's recently released 30-Year Plan for Greater Adelaide[24] envisages a significant upward trend in the growth in the high density residential load with policy statements that contemplate a significant ACR population increase. In addition to this load, recent announcements by the State government have indicated that new step loads will be seen in the region following commissioning of the new Royal Adelaide Hospital and the completion of the first stage of the rail electrification project.

The existing network infrastructure in the area consists of a single 275 kV oil-filled cable from Magill substation to East Terrace substation where a single 225 MVA 275/66 kV transformer is in service. ElectraNet has had this transformer assessed by an external transformer specialist to determine a suitable long-time emergency cyclic loading for this unit and to delay the need for augmentation for the maximum time possible. The engineering report produced on this transformer has allowed ElectraNet to apply a long-time emergency cyclic loading of 270 MVA for eight hours to this transformer. A single 275 kV XLPE cable from Torrens Island substation to City West substation also supplies into the ACR via a 300 MVA 275/66 kV transformer.

The underlying distribution network consists of multiple 66 kV sub-transmission overhead lines and cables that are fed from remote 66 kV substations embedded in the SA Power Networks system. These 66 kV in-feeds supply local 33 kV and 11 kV distribution systems of predominantly cables that supply the commercial premises, businesses and homes in the ACR.

12.2 Project Description

The proposed works include the extension of the existing busbar, installation of a second transformer, and addition of NEX's at East Terrace and Magill.

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.

12.3 Trigger Event

- Forecast load exceeding 270 MVA in the Adelaide Central Region
- Completion of the regulatory investment test for transmission including a comprehensive assessment of credible options demonstrating that a second transformer at East Terrace substation is justified

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

- ElectraNet Board commitment to proceed with the project subject to the AER amending the revenue determination pursuant to the Rules

These trigger events are specific and capable of objective verification, relate to a specific location, and are probable but too uncertain to include the proposed contingent project in the capital expenditure forecast.

12.4 Project Requirement

The ETC categorises the Adelaide Central Region (ACR) grouped exit point, which includes the East Terrace and City West connection points, as (the only) Category 5 exit point. Since 31 December 2011, ElectraNet has been required to provide N-1 equivalent capacity into ACR for at least 100 per cent of Agreed Maximum Demand (AMD) on a continuous basis by means of independent and diverse transmission substations. In the event of an interruption, the ETC requires ElectraNet to use its best endeavours to restore 100 % equivalent line and transformer capacity into the ACR as soon as practicable after the commencement of the outage.

Under N-1 conditions, the East Terrace substation must supply the entire ACR load during loss of either the City West transformer or the TIPS to City West 275 kV cable. The results of an independent engineering assessment determined that the existing East Terrace transformer's summer cyclic loading limit was 270 MVA for eight hours.

Based on ElectraNet's modified 10 per cent PoE connection point demand forecasts the load for the ACR will exceed 270 MVA by the summer of 2025/26. That is, by summer 2025/26 the East Terrace substation will fail to satisfy the ETC since it will be unable to independently supply the ACR AMD under the contingent loss of the City West to Torrens Island 275 kV cable or the City West (ACR) transformer. To satisfy the requirements of the ETC it is therefore necessary to augment the transmission network by installing a second transformer at East Terrace before the end of November 2025.

A step load for a major SA Power Networks customer involving the supply of the State government's proposed electric train network has not been included in the revised forecast. Should this step load be included on top of the forecast, the load in the ACR region would exceed the 270 MVA long-time emergency cyclic loading of the East Terrace transformer within the next regulatory control 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 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 $23 million.

This estimate is based on the installation of a second 225 MVA 275/66 kV transformer at East Terrace substation along with all associated substation works and the installation of Neutral Earthing Reactor's at East Terrace on both transformers and at Magill on Transformers #2 and #3 to ensure that the phase to earth fault level in the Eastern suburbs and in the ACR is managed and kept under the value of the three phase fault current rating of plant and equipment and the substation earth grids.

The methodology used for developing the forecast cost estimate was 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 $13.7 million.[25]

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.

[25] This represents 5 per cent of the MAR for the first year of the regulatory control period. Refer Chapter 12.