Regulatory Test – Final recommendation report

Proposed Installation of a New 33kV Capacitor Bank at Stanthorpe

12 September 2014

Ergon Energy Corporation Limited

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EXECUTIVE SUMMARY

Ergon Energy Corporation Limited (Ergon Energy) is responsible (under its Distribution Authority) for electricity supply to the Stanthorpe area in southern Queensland.

Ergon previously identified limitations in the electricity distribution network supplying the Stanthorpe area. These limitations were identified based on previous projected load growth and the security criteria that Ergon was applying at that time.

Ergon Energy published a Request for Information relating to this previously identified emerging network constraint on 14 November 2013. Three submissions were received by the closing date of 28 January 2014.

Ergon Energy published a Consultation and Draft Recommendation on 8 May 2014. No submissions to the Consultation and Draft Recommendation were received by the closing date of 16 June 2014.

Four feasible solutions to the emerging network constraint have been identified:

Option 1	Network Solution – Install Capacitor Bank
Option 2	External Party A – Load Curtailment & Customer Generation
Option 3	External Party B – 4.4MW of Diesel Generation
Option 4	External Party C – 4.8MW of Diesel Generation

In accordance with the requirements of the National Electricity Rules (NER), this is now a Final Report which includes Ergon Energy assessment of all identified options and details of the actions recommended to be taken.

Since publication of the draft recommendation, Ergon Energy has been working towards improving the reliability and condition of the existing 110KV line. As part of this operational work significant refurbishment of the 110kV line is taking place, and to support this work a 33kV voltage regulator is being installed on the existing 33kV line which supplies back up supply to Stanthorpe. As a result of the installation of this voltage regulator, coupled with changes to the Security Criteria which came into effect on 1st July 2014, as well as revised load forecasts, Ergon Energy has identified that there is no longer a need, and as such it would not be prudent and efficient to proceed with any of the options outlined in the Consultation and Draft Recommendation.

Although not directly related to this recommendation, Ergon Energy has previously consulted on the proposed construction of a new 110kV line between Warwick and Stanthorpe. In the interest of the Regulatory process and to advise the community, Ergon Energy provides the following information in relation to these works:

Based on current growth forecasts for the Stanthorpe area, Ergon Energy's new security criteria, and the reliability performance expected on the 110kV line, Ergon Energy no longer identifies a need to build a new 110kV line from Warwick to Stanthorpe. As a result of this, Ergon Energy is proposing to discontinue the line easement acquisition and instead will continue to focus on improving the capacity and reliability performance of the existing 33kV and 110kV lines supplying the Stanthorpe area.

1. INTRODUCTION

This Final Report is based on:

- the Request for Information consultation undertaken by Ergon Energy to identify potential solutions to address the distribution network limitations; and
- an analysis of feasible options in accordance with the AER's Regulatory Test.

This project has been considered under the reliability limb of the Regulatory Test.

Information relating to the consultation about this project is provided on our web site:

http://www.ergon.com.au/community--and--our-network/network-management-and-projects/regulatory-test-consultations

For further information, please email: regulatory.tests@ergon.com.au

2. BACKGROUND AND PURPOSE

2.1. Background

If technical limits of the distribution system will be exceeded and the rectification options are likely to exceed $10M, Ergon Energy is required under the NER[1] to notify Registered Participants,[2] AEMO and Interested Parties[3] within the time required for corrective action and meet the following regulatory requirements:

- Consult with Registered Participants, AEMO and Interested Parties regarding possible solutions that may include local generation, demand side management and market network service provider options[4].
- Demonstrate proper consideration of various scenarios, including reasonable forecasts of electricity demand, efficient operating costs, avoidable costs, costs of ancillary services and the ability of alternative options to satisfy emerging network limitations under these scenarios.
- Ensure the recommended solution meets reliability requirements while minimising the present value of costs when compared to alternative solutions[5].

Ergon Energy is responsible for electricity supply to the wider Stanthorpe area (under its Distribution Authority) and had previously identified emerging limitations in the electricity network supplying the Stanthorpe area.

Since the commencement of this report, as mentioned above, various policies, regulations and load forecast have changed which has materially changed the initial assumptions. This information has only recently been able to be considered by the project.

2.2. Purpose of this "Final Report"

The purpose of this Final Report is to:

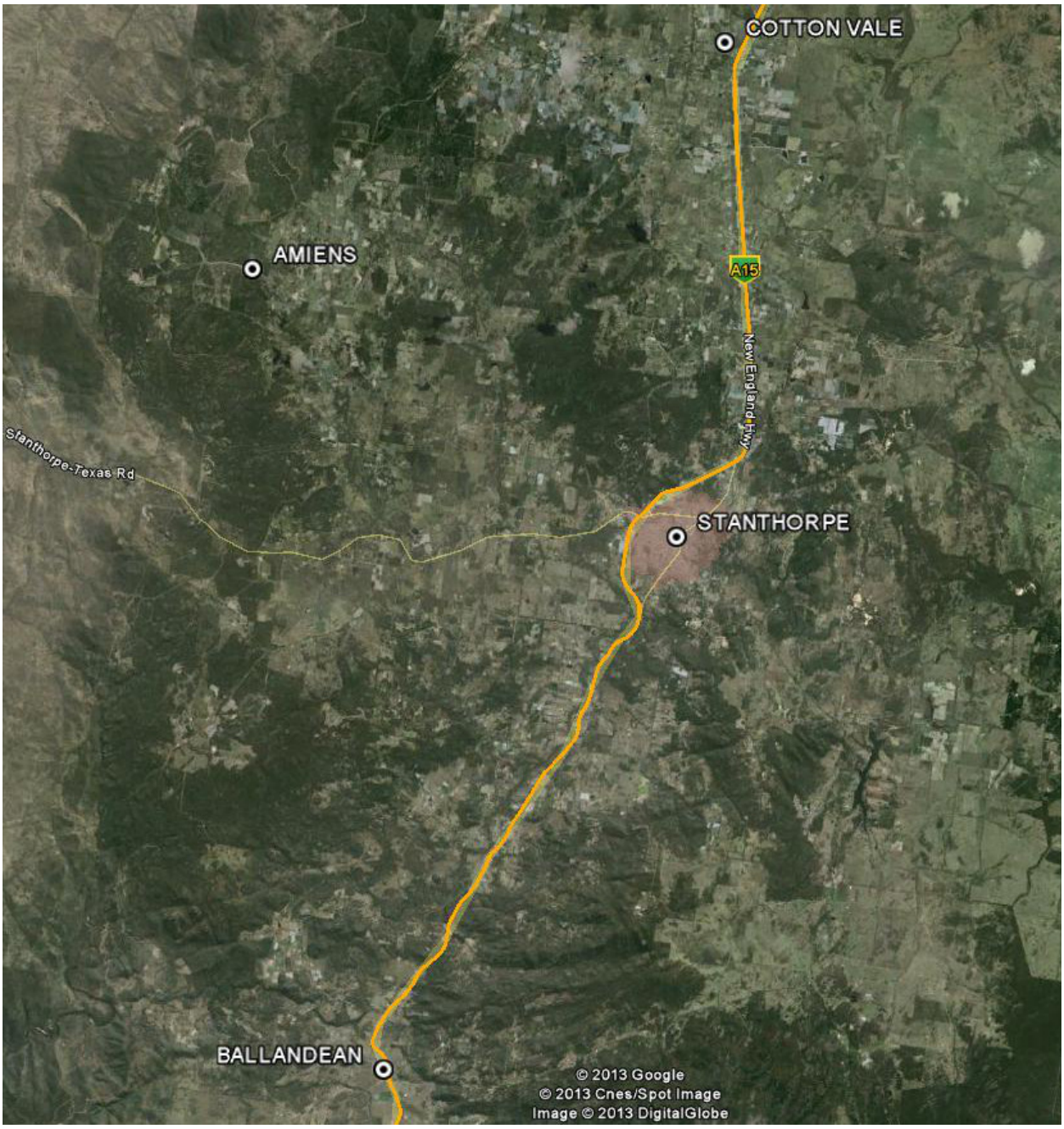
- Provide information about options identified and considered.
- Report the solution Ergon Energy has decided on.

[1] Clause 5.6.2(f)
[2] As defined in the NER
[3] As defined in the NER
[4] NER clause 5.6.2(f)
[5] In accordance with the AER's Regulatory Test Version 3, November 2007

3. EXISTING SUPPLY SYSTEM TO THE STANTHORPE AREA

3.1. Geographic Region

The geographic region covered by this Final Report is broadly described as the Stanthorpe area as shown on the map below.



3.2. Existing Supply System

Stanthorpe T60 Bulk Supply substation is supplied via a single 110kV line from Warwick T58 Bulk Supply substation. From here, supply is distributed to the Stanthorpe area.

Stanthorpe, Ballandean, and the surrounding area 11kV customers are supplied by Ergon Energy's Stanthorpe Town and Pozieres 33/11kV substations. These substations are supplied from the 110/33kV transformers at Stanthorpe T60 Bulk Supply substation. Stanthorpe T60 is supplied via one overhead 110kV line from Warwick T58 Bulk Supply. In the draft recommendation it was explained that as a back-up, the 33kV system from Warwick can supply 7MVA of load. However, following the installation of a Voltage Regulator to facilitate the refurbishment of the 110kV line, capability of 33kV line has been increased to approximately 10MVA and as a result the previously identified limitation has been reduced to an acceptable level.

4. OPTIONS CONSIDERED

4.1. Consultation Summary

During its planning process, Ergon Energy identified that action would be required to address a distribution network limitation related to supply to the Stanthorpe area.

On 14th November 2013 Ergon Energy released a Request for Information providing details on the network limitations in the Stanthorpe area. That paper sought information from Registered Participants, AEMO and Interested Parties regarding potential solutions to address the anticipated limitations.

Ergon Energy received three submissions by 28th January 2014, being the closing date for submissions to the Request for Information paper.

On 8 May 2014, Ergon Energy released a Consultation and Draft Recommendation Report. Ergon Energy received no submissions to the Consultation and Draft Recommendation Report, by 16 June 2014, being the closing date for submissions.

4.2. Non-Network Options Identified

In order to satisfy the Regulatory Test, Ergon Energy sought to identify demand side options or demand side/network combinations that address the network limitations at a lower total present value than the proposed network solution.

To be considered an alternative demand side option, the proposed solution was required to:

- Have the capacity to defer the proposed network solution by reducing demand below the identified constraint limits;
- Cost less than the savings gained by deferring or removing the proposed network solution; and
- Meet all applied service standard requirements.

This analysis identified no feasible demand side alternative options.

4.3. Distribution Options Identified

In addition to the consultation process to identify possible non-network solutions, Ergon Energy carried out studies to determine the most appropriate distribution network solutions, based on the security criteria and forecast growth, and network capability at that time, it was considered that a "do nothing" approach was unacceptable. Four corrective solutions were identified, details of which are contained in the following Section 5.

5. PROPOSED SOLUTIONS

This section provides an overview of the solutions identified, with full details of the financial analysis contained in Section 7. Figures shown below do not include Ergon Energy overheads.

5.1. Option 1 – Install 6MVAr Shunt Capacitor Bank by October 2015

Option 1 – Install Capacitor Bank		
Completion Date	*Augmentation*	*Capital Cost*[6]
October 2015	Install a new 6MVAr 33kV capacitor bank at T60 Stanthorpe BSS, including associated 33kV CB bay.	$ 740,000

The installation of the capacitor bank as proposed was considered to have the following benefits:

- Increase the supply capacity of the voltage constrained 33kV line from its present 7MW to 10MW
- Provide improved voltage levels at the T60 Stanthorpe 33kV bus when the Middle Ridge to Warwick 110kV line 736 is out of service at high load times
- Provide ongoing benefit after the 10yr study period

Disadvantages of this option are:

- Some customers may not have supply restored in a timely manner for an unplanned outage to the 110kV line at high load times
- Would not be completed by November 2014

5.2. Option 2 – External Party A – 3.8MW of Demand Response & Customer Generation

Option 2 – External Party A		
Completion Date	*Augmentation*	*Total Annual Cost over Ten Years*[7]
November 2014	Customer Contracts & Customer Generation Deployment (includes 20hrs pa run time)	$ 510,000 pa

This option involved delivery of the following work:-

- Contract 1.3MW of existing customer generation
- Demand response contracts to provide curtailment of 0.5MW of existing customer loads
- Installation of ten 200kVA customer generators & associated contracts
- Installation of remote monitoring & control facilities
- This solution to be used during an outage to the 110kV line

The Option 2 programme of works as proposed would have the following benefits:

- Can be implemented by November 2014
- Will allow timely supply restoration to more non-contracted customers than Option1

Disadvantages of this option are:

- Has a cost that is about 4 times higher than Option 1

[6] Does not include overheads
[7] Does not include overheads

5.3. Option 3 – External Party B – 4.4MW of Diesel Generation

Option 3 – External Party B			
Date Req'd	*Augmentation*	*Capital Cost*[8]	*Operational Cost*
October 2014	Purchase land – 2000m^2 approximately	$ 160,000	
May 2015	External party to establish 4 x 1.1MW diesel power station including LV switchroom & step-up TFs		$726,000 per year *(based on 10yr contract, excludes cost of fuel)*
May 2015	Construct approximately 2.5km of overhead 11kV line to the generation site & 11kV CB bay at Stanthorpe Town zone sub	$ 400,000	
May 2015	Establish HV Switchgear at generation site (including building)	$ 270,000	

This option involved delivery of the following work:-

- Purchase of land for the proposed generation site (approximate size = 2000m^2 at a cost of $80 per sqm)
- Required network connections (assumption – 2.5km of 11kV line, plus CB bay at substation)
- Establish a HV switchroom at the generation site
- External Party B to install 4 x 1.1MW diesel power station. Ergon Energy to pay for fuel costs.
- This solution to be used during an outage to the 110kV line

The Option 3 programme of works as proposed would have the following benefits:

- Will allow timely supply restoration to more customers than Option1

Disadvantages of this option are:

- Significantly higher cost than Options 1 & 2
- Potential for negative reaction from the community and the council due to perceptions of noise & air pollution as the site is on the edge of Stanthorpe

[8] Does not include overheads

5.4. Option 4 – External Party C – 4.8MW of Diesel Generation

Option 4 – External Party C			
Date Req'd	*Augmentation*	*Capital Cost*[9]	*Operational Cost*
November 2014	External party to establish 4 x 1.2MW diesel power station including the site, HV switchgear & 20hrs run time per year.		$1,320,000 per year *(based on 10yr contract)*
November 2014	Establish connection from the power station to the nearby Ergon 11kV network	$ 200,000	

This option involved delivery of the following work:-

- External Party C to install 4 x 1.2MW diesel power station. Including the site & HV switchgear.
- Required network connections (assumption – isolator, recloser, metering unit & associated of 11kV line)
- This solution to be used during an outage to the 110kV line

The Option 4 programme of works as proposed would have the following benefits:

- Will allow timely supply restoration to more customers than Options 1, 2 & 3
- Can be implemented by November 2014

Disadvantages of this option are:

- Significantly higher cost than Options 1, 2 & 3
- Potential for negative reaction from the community and the council due to perceptions of noise & air pollution as the site is on the edge of Stanthorpe

[9] Does not include overheads

6. FINAL DECISION & RECOMMENDATION

Based on the conclusions drawn from the analysis of options provided and given improved network capability, changes to growth forecasts, and Ergon Energy's new security criteria, it is recommended that Ergon Energy does not proceed with any of the identified options.

7. ADDENDUM 1 - ADDITIONAL INFORMATION

Ergon Energy has previously made public an intention to establish a 2nd 110kV line from Warwick to Stanthorpe to increase the supply security and reliability to the Stanthorpe area customers. As part of the proposed establishment of this new 110kV line Ergon commenced a process, which included stakeholder engagement and consultation, to acquire a line easement between Warwick and Stanthorpe for this future new 110kV line.

Based on current growth forecasts for the Stanthorpe area, Ergon Energy's new security criteria, and the reliability performance expected on the 110kV line, Ergon Energy no longer identifies a need to build a new 110kV line from Warwick to Stanthorpe. As a result of this, Ergon Energy is proposing to discontinue the line easement acquisition and instead will continue to focus on improving the capacity and reliability performance of the existing 33kV and 110kV lines supplying the Stanthorpe area.