

## **DEMAND MANAGEMENT REVIEW**

### **Brandy Hill Zone Substation**

#### **Current Supply Arrangements**

Wallalong zone substation is a single transformer 33/11kV substation. It was constructed in 1987, with a single 5MVA transformer, a single 33kV circuit breaker and a single 11kV circuit breaker.

The zone substation has a licence capacity limit of 4.52MVA in both summer and winter. Based on current forecasts, demand would exceed this level by summer 2012/13.

Condition analysis has determined that the circuit breakers at Wallalong zone should be replaced prior to 2012.

Due to the limited capacity of Wallalong zone substation, much of the Wallalong load area is currently supplied by long 11kV feeders from adjacent zone substations at Raymond Terrace, Thornton, and a Country Energy substation to the north. There are emerging capacity and voltage regulation problems with this existing 11kV feeder arrangement and a continuation of this approach would lead to unacceptable reliability exposures.

Wallalong zone is supplied via a 33kV feeder system from Beresfield Subtransmission Substation (STS). Capacity of the Thornton to Wallalong tee section, which supplies both Wallalong zone and Country Energy loads to the north, is 9.8MVA. Based on current forecasts, demand would exceed this level by summer 2009/10.

The licence capacity at Beresfield STS is 142.9MVA in summer and winter. Based on current forecasts the load would exceed this level in summer 2014/15.

#### **Supply Strategy Option**

The preferred supply side option is to build a new 132/11kV zone substation at Brandy Hill consisting of two 37MVA transformers.

The site of the proposed Brandy Hill zone is located to take advantage of a new 132kV feeder which will be built by Transgrid, which reduces the cost of proposed substation substantially.

Approximately 8MVA of 11kV load will be transferred onto the new zone substation from Raymond Terrace zone, 4MVA from Thornton zone, and 4MVA from Country Energy areas to the north.

The cost of the project is estimated at \$20.4m. To meet the required completion date of December 2011, a decision must be made by August 2009.

## **Consideration of Demand Management Alternatives**

A project to replace the circuit breakers at Wallalong zone is required to be completed before the end of 2012, so irrespective of demand levels a solution is required in that timeframe.

In order to replace the circuit breakers the entire zone must be rebuilt, and there is insufficient space at the current site for a new substation built to a standard design.

The existing loads in the Wallalong area total more than 10MVA and an “n-1” solution is required by our licence conditions to supply loads of this size.

The proposed Brandy Hill 132/11kV zone substation is the least cost option identified for replacing the aged assets at Wallalong zone and supplying the overall load in the Wallalong area.

In taking advantage of cost reduction opportunity from using the new 132kV Transgrid line, the substation will be built to the standard 132kV design consisting of two 37MVA transformers, which is the smallest capacity option for a substation of this voltage level. If the demand was lower, it would not result in a change to the basic design or a reduction in project cost.

## **Conclusion**

There is no option for deferral of the project timing using demand management as it is driven by replacement requirements. In addition there are no less expensive project options available that would be enabled through implementing demand management alternatives.