

DEMAND MANAGEMENT SCREENING TEST

Balgowlah

Current Supply Arrangements

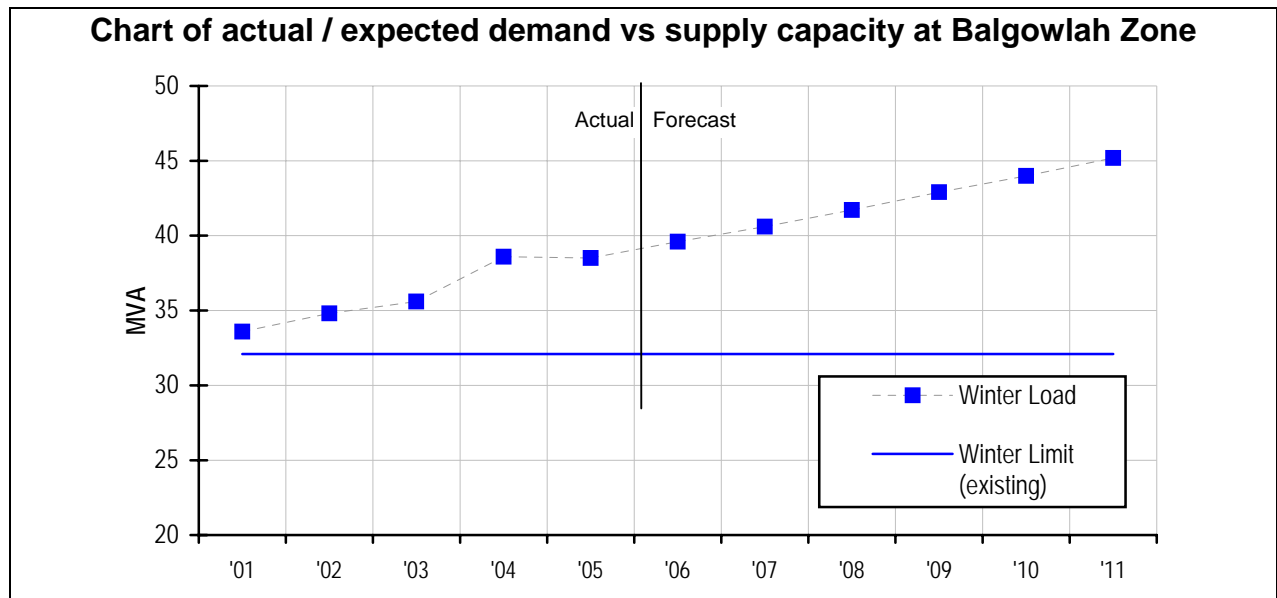
Balgowlah zone substation consists of two 33/11kV transformers. It is currently supplied via a 33kV feeder S01, with backup supply from feeder S10, both from Warringah Sub Transmission Station. S01 is also the backup feeder to Killarney zone substation.

While it can supply up to 40.6MVA, the maximum recommended load on Balgowlah substation is limited by the transformer ratings to 30.8MVA in summer & 32.1MVA in winter. The 33kV feeder S01 supplying Balgowlah zone substation (and providing backup for Killarney zone substation) can supply 47.2MVA in winter and 41.4MVA in summer.

The Balgowlah zone substation supplies Balgowlah, North Balgowlah, Seaforth, Clontarf, Balgowlah Heights, Fairlight and Manly Vale. The Killarney zone substation supplies Forestville and Killarney Heights.

Supply Capacity and Demand Forecast

The Balgowlah zone is primarily residential and the peak load is during winter from 7pm to 9pm. This winter peak is the only season in which Balgowlah zone substation is forecast to be of concern. The forecast peak demand for the Balgowlah zone in winter 2006 is 38.8MVA, which exceeds the acceptable load on the substation. The winter peak demand is forecast to continue to grow, as shown in the chart below.



Feeder S01 (to Balgowlah zone) provides back up to Killarney zone, hence in an emergency feeder S01 would need to provide the total load of both zones. This total load will be 57.2MVA in winter 2006 which is well above the feeder's recommended capacity of 47.2MVA. This total load is also forecast to continue to grow.

Balgowlah zone substation has major equipment which is approaching the end of its useful life. All major equipment at the substation is recommended for replacement within the next ten years, and all switch gear within 5 years.

Supply Strategy Option

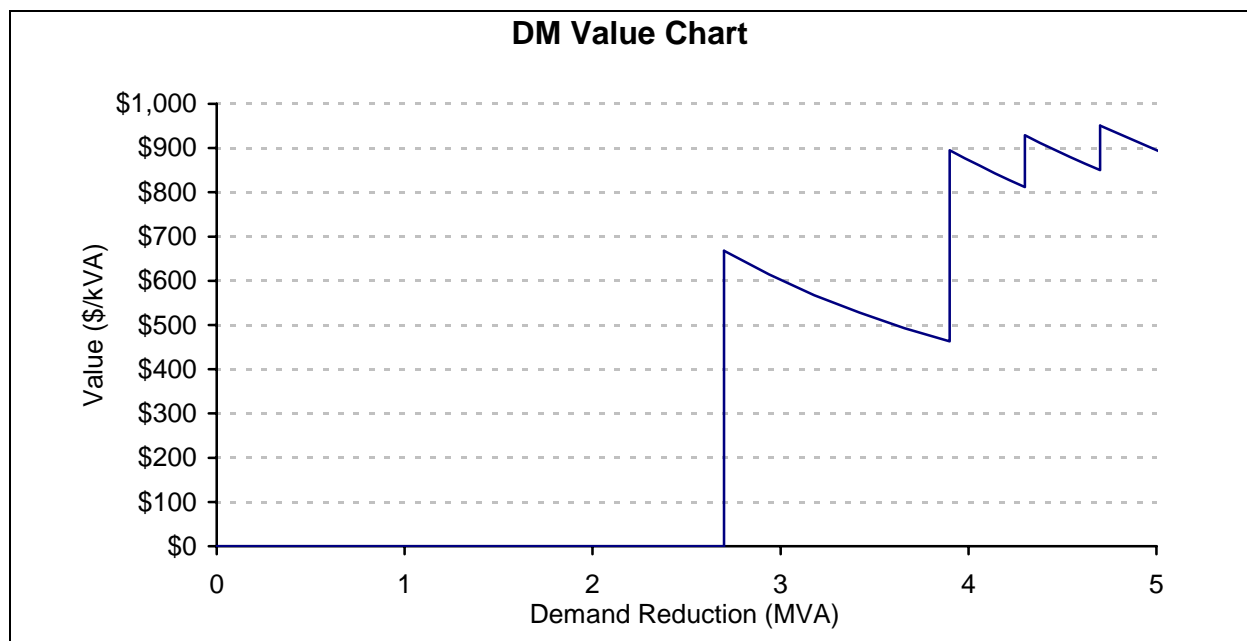
The default supply system solution includes three parts:

- A) Transfer 10MVA of the load in Balgowlah to the Harbord zone substation at a cost of \$4.5million. A final decision on whether to do this needs to be made as soon as possible, with commissioning proposed for the end of 2006.
- B) Install a new 33kV feeder in parallel to S01 at a cost of approximately \$7million. A final decision on whether to do this needs to be made by late 2006, with commissioning proposed for winter 2007.
- C) Construct a new 132/11kV zone substation to replace the existing Balgowlah zone substation at a cost of approximately \$25million. A final decision on whether to do this must be made by about mid 2007, with commissioning planned by the end of 2009.

Required Demand Management Characteristics

An analysis of a number of different scenarios has shown that at a minimum, a demand reduction of 2.7MVA in Balgowlah before winter 2009 would defer the construction of the new 132/33kV substation by 1 year, making a saving of approximately \$1.8million (\$668/kVA). A DM investigation would have until mid 2007 to determine whether this much reduction is possible. This scenario would not defer any of the other parts of the supply strategy.

The analysis also showed that larger amounts of demand reduction could defer various parts of the supply options by different numbers of years. The values of some of these scenarios are shown in the graph below:



Recommendation

Based on this analysis it is considered reasonable to expect that it may be cost-effective to postpone the proposed new substation and possibly the new feeder by implementing demand management strategies. None of the scenarios analysed showed that it would be reasonable to expect that it may be cost-effective to postpone the 10MVA load transfers.

A demand management investigation will be undertaken involving a desktop investigation of existing residential demand management programs, and a public consultation. The investigation will focus on deferring the zone substation and the new feeder (parts B and C), and not on deferring the 10MVA load transfers (part A).

We have also identified a requirement to address load growth on certain 11kV feeders in Balgowlah zone. Any demand management solutions for the 11kV feeder loads may also contribute to reducing critical loading at Balgowlah zone and these investigations will be conducted jointly.