

DEMAND MANAGEMENT SCREENING TEST

Balgowlah North Zone Development

Current Supply Arrangements

Balgowlah Zone substation is located west of Manly and consists of two 33/11kVA transformers. The 11kV feeders 1, 3, 4, 7, 10, and 14 from Balgowlah North Zone supply the areas of Balgowlah, North Balgowlah, Balgowlah Heights and Seaforth. These feeders are the subject of this document.

The licence conditions require that a feeder's load does not exceed 80% of its maximum rated load under normal system conditions. This feeder system is designed so that if any one feeder experiences an outage, the loads on that feeder can be picked up by either of the other two interconnected feeders. This should be achieved with a maximum of 3-5 switching operations as stipulated in the licence requirement that 11kV customer interruptions in urban areas with a population of greater than 5000 should be less than 4 hours

Supply Capacity and Demand Forecast

The peak demand on the 11kV feeders occurs during winter night and is predominately a residential type load. The area is forecast to grow at 2.5% for winter.

Five feeders (1, 7, 14, 10, and 3) are forecast to exceed 80% of their maximum rated load during normal system conditions. These five feeders plus feeder 4 are also forecast to exceed 100% of their rated load during outage conditions.

The following table details the loads on the relevant feeders.

Normal Conditions (80% licence capacity):

Feeder	Capacity Limit (MVA)	Forecasted Load (MVA)					
		Winter 2011	Winter 2012	Winter 2013	Winter 2014	Winter 2015	Winter 2016
1	5.2	5.6	5.7	5.9	6.0	6.1	6.3
7	6.1	5.8	5.9	6.0	6.2	6.3	6.5
14	4.8	5.4	5.5	5.7	5.8	5.9	6.1
10	5.3	5.8	6.0	6.1	6.3	6.4	6.6
3	5.4	5.2	5.2	5.3	5.4	5.4	5.5

Outage Conditions (100% licence capacity):

Outage on	Pickup Feeder	Capacity Limit (MVA)	Forecasted Load Emergency Load (MVA)					
			Winter 2011	Winter 2012	Winter 2013	Winter 2014	Winter 2015	Winter 2016
Feeder 1	14	6.1	7.3	7.5	7.7	7.9	8.1	8.3
Feeder 4	1	6.6	9.0	9.2	9.4	9.7	9.9	10.2
Feeder 7	1	6.6	6.5	6.7	6.8	7.0	7.2	7.4
Feeder 10	14	6.1	7.9	8.1	8.3	8.5	8.7	8.9
Feeder 10	3	6.7	7.5	7.6	7.7	7.8	7.9	8.0
Feeder 14	1	6.6	6.7	6.8	7.0	7.2	7.4	7.5

Supply Strategy Option

The preferred option involves establishing two new 11kV feeder panels from Balgowlah North Zone as well as major network reconfiguration.

The planning estimate for this project is \$6.4M. The agreed practical completion date is June 2012. A decision on this investment must be made by June 2011.

Required Demand Management Characteristics

Assuming a best case, a total of 5 MVA of demand reduction is required on the feeders by winter 2012 to allow a 1 year deferral. This represents 17% of the total load on the feeders. A 1 year deferral has a potential saving of \$0.41M, which corresponds to \$82.15/kVA.

For a 2 year deferral, 5.3 MVA of demand reduction is required by winter 2013. The potential saving for a 2 year deferral is \$0.71M which equates to \$150/kVA.

For a 3 year deferral, 5.7 MVA of demand reduction is required by winter 2014. The potential saving for a 3 year deferral is \$1.15M which equates to \$202/kVA.

This analysis assumes that a demand reduction that resolves one scenario is located in a section of the feeder that would also be effective in resolving other scenarios. If the demand reduction could not be achieved in these optimal locations, the total demand reduction needed would be larger,

The demand reduction required is large and represents a significant proportion of the existing load on the feeders. The potential savings are relatively small and represent low to moderate value in terms of \$/kVA. Demand reduction is also traditionally difficult to achieve in residential areas.

Given the large demand reduction required combined with the small savings, it is not reasonable to expect an effective DM option can be found in an investigation.

Recommendation

Based on this analysis it is not considered reasonable to expect that it may be cost-effective to postpone the proposed supply-side solution by implementing demand management strategies.