

DEMAND MANAGEMENT SCREENING TEST

Rhodes Zone Substation

Current Supply Arrangements

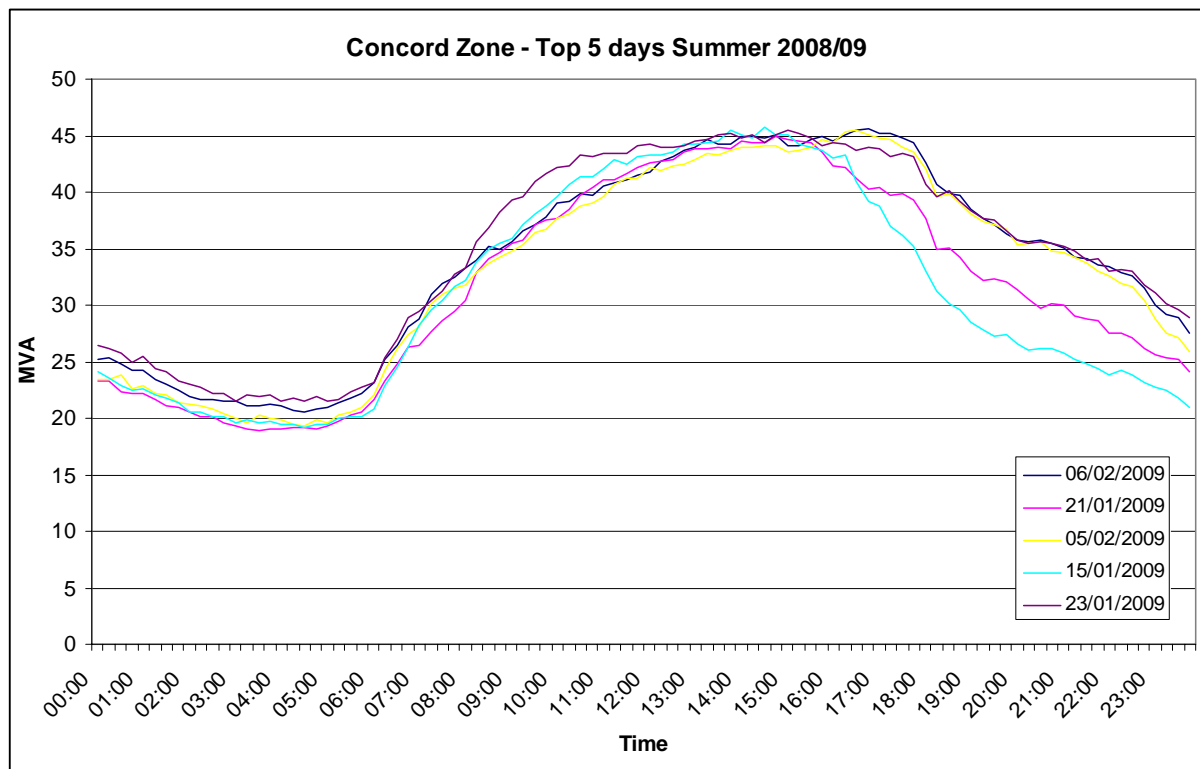
The Rhodes area is a peninsular that is currently supplied from Meadowbank zone substation via four submarine 11kV feeders and six 11kV feeders from Concord zone substation.

Concord zone substation consists of four 33/11kV transformers and is supplied by four 33kV feeders from Homebush STS.

The present capacity of Concord zone substation is limited by the rating of the 33kV feeders, resulting in a licence capacity of 46.9MVA in summer and 52.6MVA in winter.

Supply Capacity and Demand Forecast

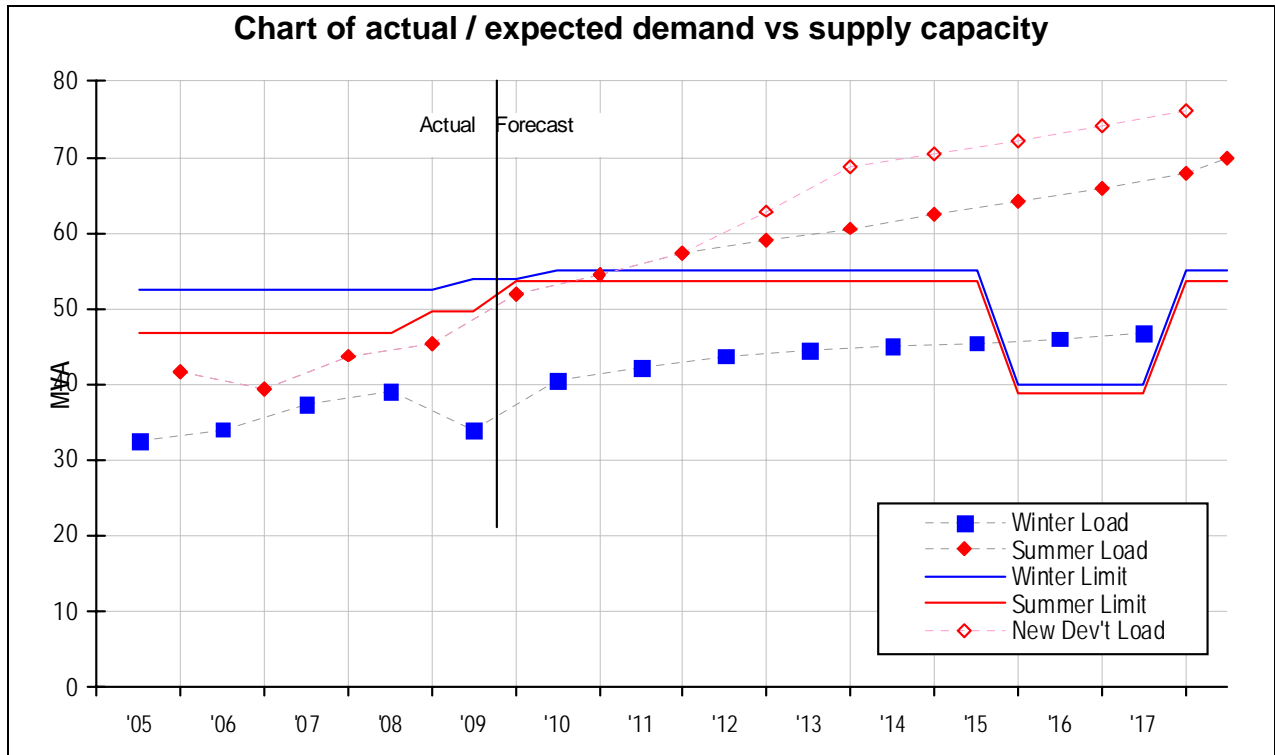
Summer is the critical season for this zone substation. The load is a mix of residential and commercial customers.



We forecast that underlying demand would rise to 60.6MVA in summer 2013/14, and 62.4MVA in summer 2014/15. In addition to this, substantial residential development is planned over the next two to three years which we expect to add up to 8MVA of additional load by summer 2013/14.

Minor works planned at Concord Zone will increase its effective capacity to 53.7MVA by summer 2009/10.

The 11kV switchgear at Concord zone substation is approaching the end of its serviceable life, and is planned to be replaced by 2017. While this work is in progress, the effective capacity at Concord will be reduced by 15MVA from October 2015.



The submarine cables from Meadowbank are loaded to their licence capacity, so no additional load from Rhodes can readily be supplied from Meadowbank.

Supply Strategy Option

The preferred supply side option is to build a new 132/11kV Rhodes zone substation with a licence capacity estimated to be 78MVA. This is estimated to cost \$42.6M

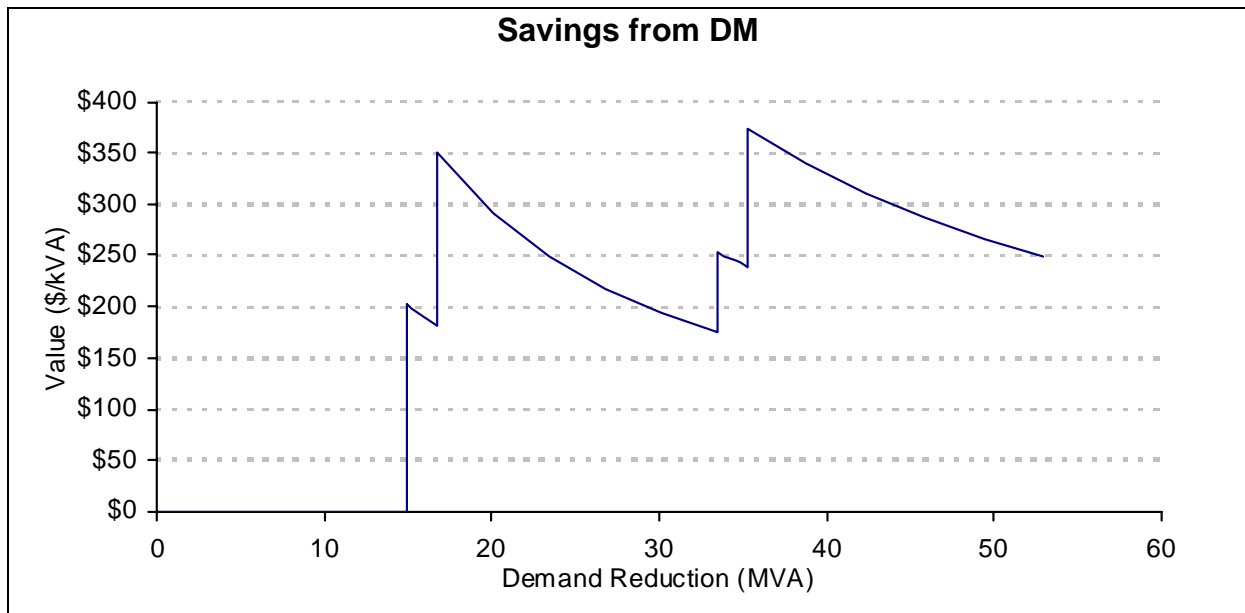
The target completion date is October 2013 and in order to achieve this, a decision on this investment must be made by 1st March 2010.

Required Demand Management Characteristics

If demand could be reduced by 14.9MVA before summer 2013/14, then the need for the investment could be deferred until summer 2014/15. This reduction represents 22% of the total demand on Concord zone. The saving from this deferral would be \$3.0m or \$203/kVA.

If demand could be reduced by 16.7MVA before summer 2014/15, then the need for the investment could be deferred until summer 2015/16. The saving from this deferral would be \$5.8m, or \$350/kVA.

For summer 2015/16 and beyond, the need to replace the 11kV switchgear makes the required reduction much larger. In summer 2015/16 we would need to reduce demand by 33.5MVA, which represents almost half the load on the substation.



The Demand Management and Planning Project (DM&PP) investigated and identified demand management opportunities in the Sydney metropolitan region at large customer sites. The DM&PP identified three large customers and identified a total of approximately 900kVA of demand reductions, at an estimated cost of \$1.3 million, or \$1,464/kVA.

The demand reduction is very high in both absolute and relative terms. There are no obvious present opportunities of this size. The potential savings are significant, and moderate to high in relative terms. It is very unlikely that cost effective demand reductions of more than one fifth of the total load on Concord zone substation could be found.

Recommendation

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

Forecast Load above Licence Capacity

The load at Concord zone substation is forecast to be above the level of the applicable licence criteria for the summer 2010/11, 2011/12 and 2012/13 seasons. Reductions in the demand during these seasons would remove or reduce the amount and duration of the load above the design level, reducing the possibility that customers would supply if a major system failure occurring during peak load times.

The amount by which the forecast peak load would exceed the licence capacity in the relevant seasons is listed below.

Year	MVA
2010/11	0.8
2011/12	3.5
2012/13	9.2

The amount of load above the licence capacity (in MVAh) has been calculated at Concord zone for the 2010/11, 2011/12 and 2012/13 summer seasons. The calculated load at risk (in MVAh) for the supply area is shown below.

Year	MVAh
2010/11	0.9
2011/12	42
2012/13	307
Total	350

Analysis of Value

If no action is taken, load would be above the licence capacity until the new Rhodes zone substation is built.

Peak demand reductions of 800kVA in summer 2010/11, 3.5MVA in summer 2011/12, and 9.2MVA in summer 2012/13 would reduce load to below the licence limit.

The basis for calculating the overall avoided distribution cost (ADC) is the difference in cash flows from delivering the supply side option three years earlier in 2010/11 when the load exceeds the licence capacity and the expected delivery date of 2013/14. This would be \$10.5m. An annual ADC is calculated according to the marginal benefit for each year. These results are shown below.

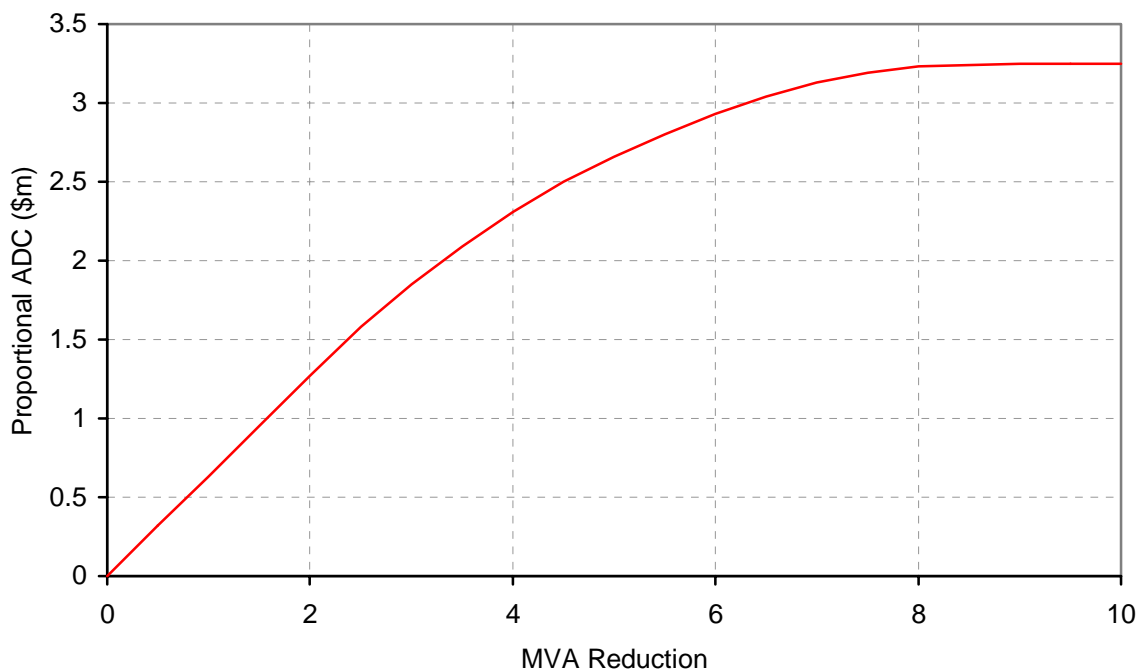
Year	ADC
2010/11	\$3.75 million
2011/12	\$3.49 million
2012/13	\$3.25 million
Total	\$10.5 million

For summer 2010/11 the load above licence capacity is 0.8MVA, which is low. The attributed ADC is \$3.75 million or more than \$4000/kVA which is very high.

For summer 2011/12 the load above licence capacity is 3.5MVA, which is moderate. The attributed ADC is \$3.49 million or \$1000/kVA which is high.

For summer 2011/12 the load above licence capacity is expected to be 9.2MVA, which is very large and likely to be only partly achievable. The attributed ADC is \$3.25 million.

The proportional ADC for demand reductions in summer 2011/12, calculated according to the IPART / AER methodology is shown in the chart below for various levels of reduction in demand.



For example, a 1 MVA reduction in demand at Concord zone substation in summer 2011/12 would reduce the amount of load above the licence limit from 302MVAh to 243MVAh – a 20% reduction. The applicable proportional avoided distribution cost would be \$630,000 or \$630/kVA.

Conclusion

The value available for the summer 2010/11, summer 2011/12 and summer 2012/13 seasons are high enough that it would be reasonable to expect it is possible to cost effectively reduce the load above the licence level at Concord zone substation.

An investigation will be undertaken to identify relevant DM options.