

## **DEMAND MANAGEMENT SCREENING TEST**

### **Medowie zone substation**

#### **Current Supply Arrangements**

Williamstown 33/11kV zone substation is located to the south of Port Stephens, and is fed via 2 feeders from Tomago 33kV sub-transmission substation.

Williamstown zone substation was built in 1963 and supplies the areas of Williamstown, Campvale, Medowie, Salt Ash and also supplies Williamstown Airport.

The system under consideration consists of two 11kV feeders (34989, 34983) which supply the Medowie area.

11kV feeder 34989 feeds a load a long way from Williamstown zone substation and requires regulators to boost the voltage to maintain the voltage at an acceptable level.

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. The licence conditions also require that the voltage on the feeder be at least 95% of the nominal voltage during system normal conditions.

The Medowie load currently exceeds the licence capacity, and the voltage level is below what is acceptable.

#### **Supply Capacity and Demand Forecast**

Williamstown zone substation demand peak load occurs during summer evenings.

Loading on Williamstown zone substation is forecast to exceed licence capacity by summer 2017/18, and the load on the 33kV network is also forecast to exceed the licence capacity of the 33kV network in summer 2017/18.

A project to build a third 11kV feeder from Williamstown zone to supply the Medowie area and associated 11kV network rearrangement is in development, and this work is planned to be completed in 2011. The forecast loading on the 11kV feeders assumes this project has been completed.

Williamstown zone substation was built in 1963, and due to the age and condition of the majority of the 33kV the circuit breakers they rescheduled to be replaced before 2014. The 11kV switchboard at Williamstown zone substation is currently a temporary arrangement, and a permanent switchboard is required before 2015.

The worst case outage for the Medowie load area is described in the table below for summer 2013/2014. The worst case scenario outage is when the trunk section of 34995 is out of service.

SS-00038  
SJ-00044

	Rating (MVA)	Load	Demand Management Requirement
Feeder 34983	7.6	6.6	0
Regulator 1	3.8	5.5	1.7
Feeder 34989	7.6	13.0	5.4
Regulator 2	3.8	12.3	8.5
Feeder 34995	7.6	0	0
Regulator 3	3.8	0	0
Total		19.6	10.2

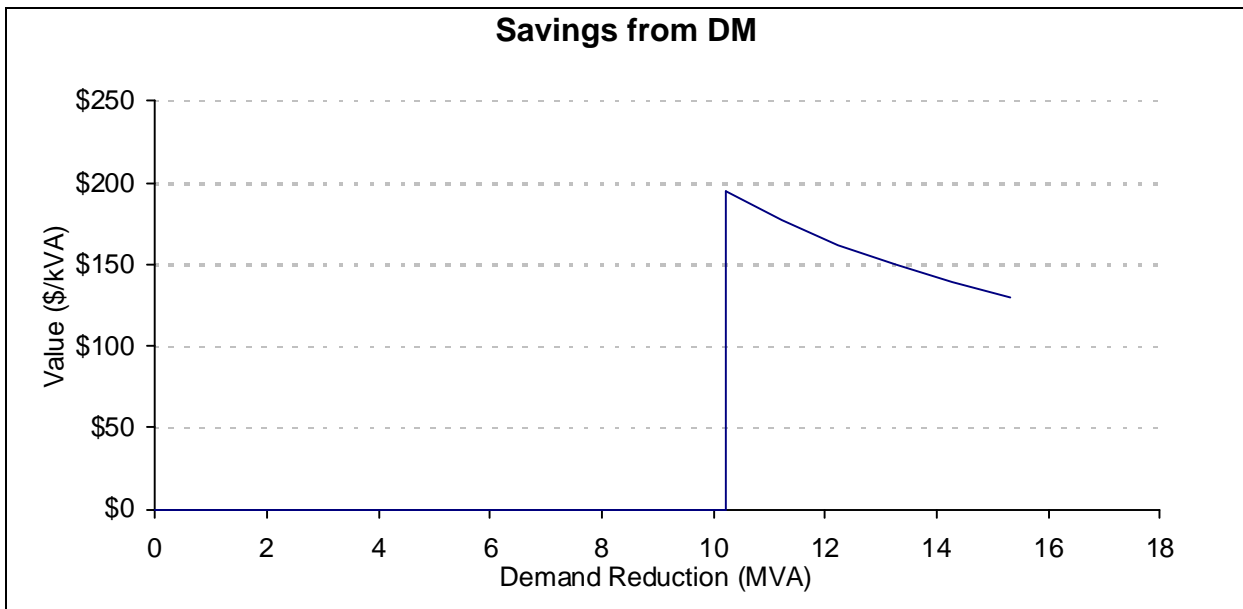
### Supply Strategy Option

The preferred supply strategy is to build a new 33/11kV Medowie zone substation, including the replacement of the 33kV circuit breakers and building a permanent 11kV switchboard at Williamtown zone substation. The planning estimate for this project is \$22.2M.

The agreed project completion date is September 2013 and a decision on this investment must be made by August 2010.

### Required Demand Management Characteristics

To achieve a one year deferral 10.2 MVA of demand reduction is required for summer 2013/14. This represents 52% of the total load on the relevant feeders, which is very large. The potential savings are approximately \$2M, or \$195/kVA, which is moderate.



The demand reduction requirement is very large in absolute terms and as a proportion of total demand on the feeders. The timeframe for a decision is short and the load is predominately residential, which increases the difficulty of achieving the required load reduction

It is therefore not considered reasonable to expect that this investment could be cost effectively deferred via demand management options.

SS-00038  
SJ-00044

## **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.

There would be value in reducing the demand for the seasons 2011/12 and 2012/13 seasons, as the load is forecast to exceed the licence limits. An investigation should be conducted to determine if demand management could achieve this cost effectively.