Demand Management Screening Test

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Epping Zone Development

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DEMAND MANAGEMENT SCREENING TEST

Epping Zone Development

Current Supply Arrangements

Epping Zone Substation consists of three 33kVA transformers which supply parts of Macquarie University, Epping and West Pymble. There are two 11kV feeders within Epping Zone (feeders 9 and 19) which are the focus 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 two adjacent interconnected feeders. This should be achieved without the interconnected feeders exceeding their maximum rated load and 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 then 5000 should be less then 4 hours.

Supply Capacity and Demand Forecast

The period of peak demand occurs during summer and is comprised of mainly commercial and residential loads, however there are some industrial loads present. The demand in this area is forecast to grow at 0.7% for both winter and summer.

There are currently plans for extensive development at Macquarie University and the surrounding area. The unconfirmed (unconnected) load is likely to be somewhere in the order of 13.5-25MVA and is expected from 2009-2014. An additional 17MVA is expected by 2023. These loads have not been included in the feeder analysis shown below.

Currently feeder 19 exceeds 80% of its maximum rated capacity during normal conditions. During an outage condition the loads on feeders 9 and 19 cannot be picked up by the adjacent feeders without exceeding their maximum rated load. The relevant feeder ratings and load details are outlined below.

Scenario	Limiting Pick Up Feeder	Capacity Limit (MVA)	Forecast Summer Load (MVA)						
			10/11	11/12	12/13	13/14	14/15	15/16	16/17
Normal Condition Feeder 19	n/a	5.1	5.4	5.4	5.5	5.5	5.5	5.6	5.6
Outage on Feeder 9	Fdr 14	5.8	6.1	6.1	6.2	6.2	6.2	6.3	6.3
Outage on Feeder 19	Fdr 2	6.4	6.8	6.8	6.9	6.9	7.0	7.0	7.1

Supply Strategy Option

The supply strategy option involves reconfiguring the feeder ties between feeder 19, 9 and 14 to provide a further pickup option to feeder 19 and a better pickup option for feeder 9. A change of open point is also required to reduce the load on Panel 19 feeder. The planning estimate for this project is $1.9M. The planned project completion date is December 2011.

A decision on this investment is required at least 12 months prior to the completion date, or no later than December 2010.

Required Demand Management Characteristics

A demand reduction of 0.74 MVA by summer 2011/12 would allow the investment to be deferred for 1 year. The potential savings for a 1 year deferral is $0.29M which is equivalent to $390/kVA.

Due to the low summer growth rate, any subsequent deferral after the first year would require an additional 90kVA of demand reduction per year. For a 6 year deferral, 1.11MVA would be required in summer 2017/2018. The potential savings for a 6 year deferral is $0.76M which is equivalent to $686/kVA.

The demand reductions would need to occur in specific locations to ensure that the limiting sections were subject to the demand reduction. The demand reduction required in proportion to the total load on the feeders is 6% in the first year and a further 1% in each subsequent year.

This demand reduction required is low in overall terms and as a proportion of the existing load on the feeders. The potential savings for short term deferral are low in absolute terms and moderate in terms of $/kVA. The savings for a long term deferral become moderate in absolute terms and high in terms of $/kVA.

In view of the small amount of demand reduction required and the potential for moderate savings, it is reasonable to expect that this investment could be cost effective to defer using demand management options.

Considering the expected but as yet unconfirmed university load is very large, the preferred supply side solution is not likely to prevent any future capital investment required to meet this load. Therefore this unconfirmed load should have no bearing on the outcome of this screening test.

Recommendation

Based on this analysis it is considered reasonable to expect that it may be cost-effective to postpone the proposed supply-side solution by implementing demand management strategies. A demand management investigation should be undertaken involving site visits and public consultation.