

DEMAND MANAGEMENT SCREENING TEST

Charlestown Zone Substation

Current Supply Arrangements

Charlestown Zone Substation consists of two 25MVA 33/11kV transformers. It is supplied from Merewether Subtransmission Substation (STS) via two 33kV feeders.

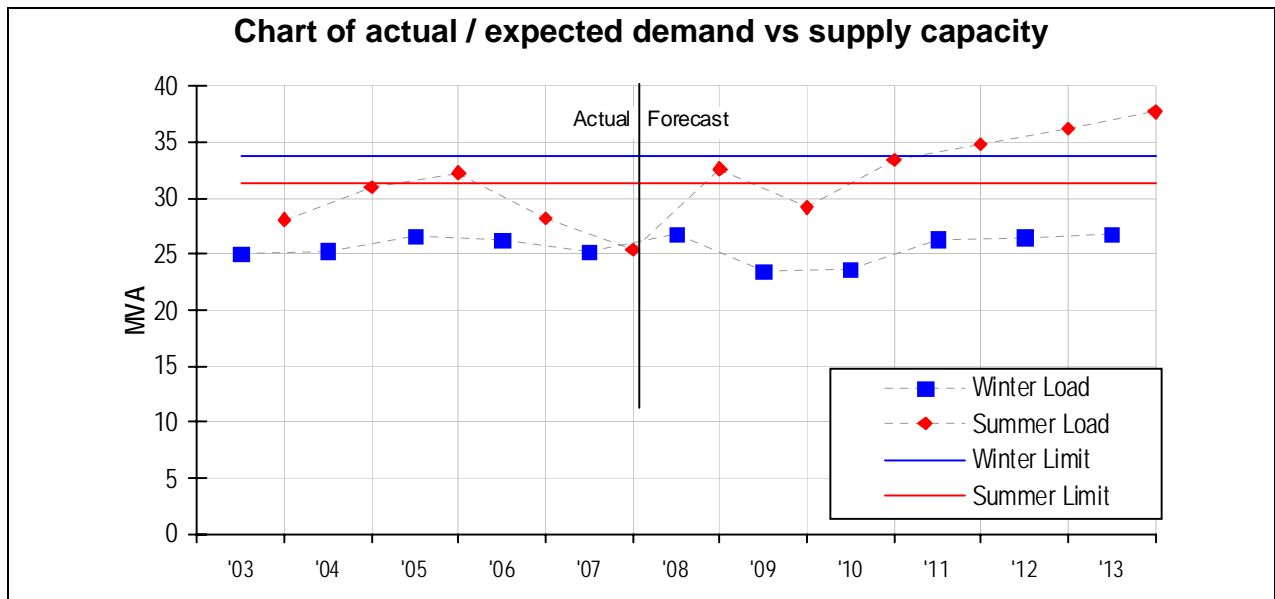
There are aged asset issues at both Charlestown Zone Substation and the adjacent Dudley Zone Substation.

These substations supply the following suburbs in the north east Lake Macquarie area – Charlestown, Dudley, Whitebridge, & Kahibah.

Supply Capacity and Demand Forecast

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

The capacity of Charlestown Zone Substation is limited to 31.3MVA in summer and 33.7MVA in winter. We forecast that demand would exceed capacity by 2.1MVA in summer 2010/11, rising to 6.4MVA by 2013/14.



The switchgear at Charlestown Zone Substation is approaching the end of its serviceable life, with switchgear due for replacement in 2012-2017, and transformers within 10-20 years. Switchgear at Dudley Zone Substation is due for replacement before 2011.

Supply Strategy Option

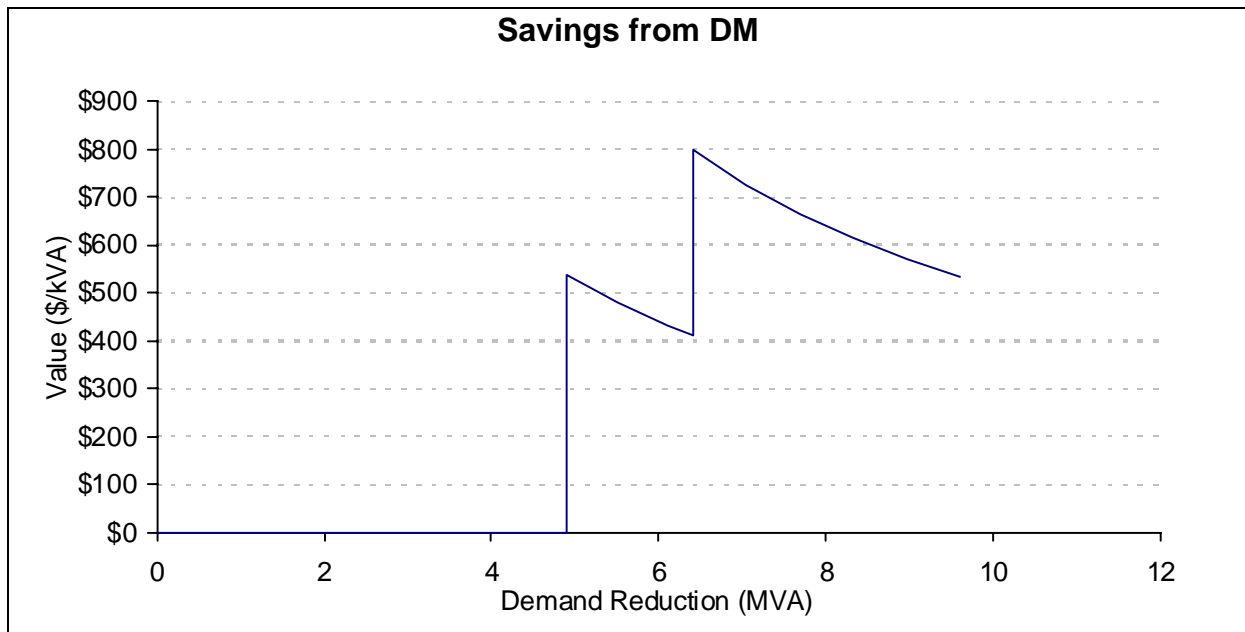
The proposed supply side investment is construction of a new 132/11kV Charlestown Zone Substation, with retirement of the existing Charlestown and Dudley Zone

Substations. The total cost of this project is estimated at \$40.5m, with commissioning proposed in 2012. A decision on this investment must be made by June 2009.

Required Demand Management Characteristics

If demand could be reduced by 4.9MVA before summer 2012/13, then the investment could be deferred by one year. This reduction represents 14% of the total demand on Charlestown Zone. A one year deferral would lead to savings of \$2.64m, or \$539/kVA, which is high.

If demand could be reduced by 6.4MVA before summer 2013/14, then the investment could be deferred by 2 years. The value of this deferral is \$5.11m, or \$799/kVA, which is high.



Note that if the 11kV switchgear replacement at Dudley Zone Substation is still required before the deferred commissioning date of Charlestown Zone Substation, then the actual deferral values will be lower than those stated above.

The demand reduction requirement is moderate in absolute terms and high in relative terms. The deferral value is very high, but the timeframe for a decision is relatively short. We are aware of a potential opportunity at a major shopping centre that may be suitable for providing demand management.

On balance, it is considered reasonable to expect that the investment could be deferred by implementing demand management.

Recommendation

Based on this analysis it is considered reasonable to expect that it might be cost-effective to postpone the proposed supply-side solution by implementing demand management strategies. A further demand management investigation will be undertaken.