DEMAND MANAGEMENT SCREENING TEST

Establishment of SOPA 132/11kV Zone Substation

Current Supply Arrangements

The Sydney Olympic Park precinct is currently supplied by 11kV feeders from Homebush Bay and Flemington zone substations. Auburn and Lidcombe zone substations are located nearby and load has been transferred from these zones to Flemington and Homebush Bay zones in the past.

Homebush Bay zone substation was designed as a three transformer 132/11kV zone substation, although it is currently equipped with two 50MVA transformers. The licence capacity is 67.8MVA in both summer and winter and is limited by the requirement to not exceed the substation firm rating by more than 88 hours in a year.

The capacity of Flemington zone substation is limited by the incoming underground feeders in summer and the rating of the four transformers in winter. Its licence capacity is currently 114.7MVA in summer and 119.3MVA in winter, based on the requirement to not exceed the substation firm rating by more than 88 hours in a year. Flemington zone substation will have its licence capacity reduced to 77.7MVA in summer and 82.7MVA in winter due to a change in the rating policy for 132/11kV four transformer substations.

Supply Capacity and Demand Forecast

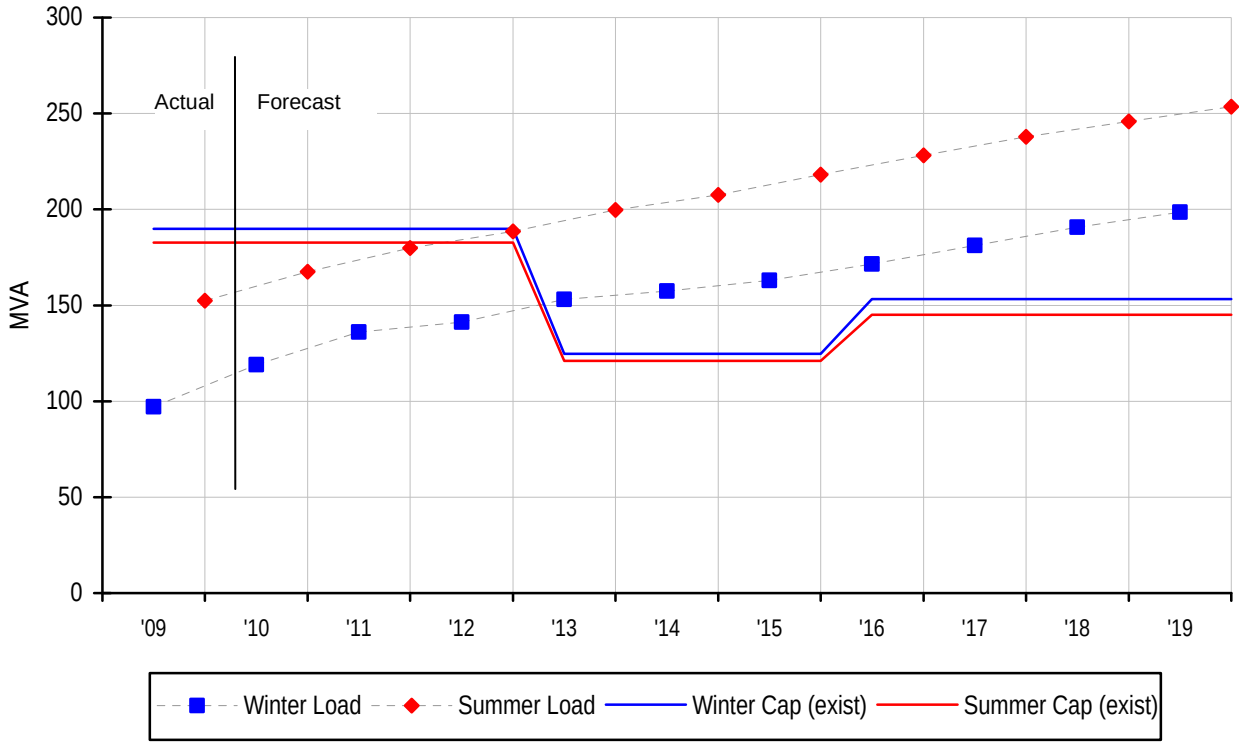
Sydney Olympic Park Authority (SOPA) has existing loads of 15MVA on Flemington and Homebush Bay zones. SOPA has confirmed expected spot load increases of 26MVA, with a further 20MVA proposed. In addition, a proposed multi-purpose development west of Sydney Olympic Park has confirmed an initial requirement for 3MVA, and is expected to ultimately require approximately 30MVA.

Approximately half of the 11kV switchgear at Flemington zone substation is scheduled to be replaced by 2016 due to asset age and condition. This requires a temporary load transfer of approximately 45MVA away from Flemington zone substation between 2013 and 2016 to enable half of the 11kV busbar to be taken out of service. During this time the effective capacity of Flemington zone will be reduced to 53.2MVA in summer and 54MVA in winter.

In the following chart, the capacity is the sum of the licence capacities of Homebush Bay and Flemington zone substations. The load is the diversified sum of the loads at the two zones, and includes an estimate of the most likely scenario for proposed new spot loads in the area.

The load is forecast to exceed the licence capacity in summer 2012/13 by approximately 6.0MVA.

Chart of actual / expected demand vs supply capacity for the combined load on Homebush Bay and Flemington zone substations



Supply Strategy Options

Two supply side options are available to increase the capacity to the area:

- Establish a new 132/11kV SOPA Zone substation with two 50MVA transformers, and a licence capacity of approximately 78MVA. The cost of this project is estimated at $41 million.

- Install a 3rd transformer at Homebush Bay zone substation, resulting in an increase of its licence capacity to approximately 127.1MVA in both summer and winter. The cost of this project is estimated at $5.6 million.

Of these two options, only establishing a new SOPA zone substation will provide sufficient capacity to supply the forecast demand. Accordingly, the preferred supply side solution is to establish a new 132/11kV SOPA zone substation before winter 2013.

In addition, if all anticipated spot load increases occur, the load supplied by the new SOPA zone substation will exceed its licence capacity in summer 2014/15, at which point, installation of the 3rd transformer at Homebush Bay zone substation will also be required.

To meet the required completion date of winter 2013, a decision on this investment must be made by September 2010.

Required Demand Management Characteristics

To defer the need for an investment entirely would require a demand reduction exceeding 70MVA, which represents over a third of the load currently supplied from Flemington and Homebush Bay zone substations. Cost effective demand reductions are unlikely to be available in this magnitude.

Alternatively, if demand could be reduced by 18.3MVA in summer 2013/14, installing the third transformer at Homebush Bay zone substation would provide sufficient capacity to service the demand. SOPA zone substation would then not be required until summer 2014/15.

If, in addition to this, demand could be reduced by 25.8MVA in summer 2014/15, SOPA zone substation would not be required until summer 2015/16.

From summer 2016/17, Flemington zone substation is returned to service in its four transformer configuration following completion of the switchgear replacement project. This will increase the capacity of the system by approximately 25MVA. As a result, if demand could also be reduced by 36.3MVA from summer 2015/16 onwards, SOPA zone substation would not be required until summer 2018/19.

The demand reduction requirements expressed in MVA and as a percentage of the system load are summarised in the following table. These figures assume installation of a third transformer at Homebush Bay zone substation by winter 2013.

Season		Summer 13/14	Summer 14/15	Summer 15/16	Summer 16/17	Summer 17/18
Required demand reduction	(MVA)	18.3	25.8	36.3	21.1	30.9
	% of system load	9%	12%	17%	9%	13%

The savings achieved by deferring SOPA zone substation until 2014/15 is $3.4 million, or $184/kVA, which is moderate. However the required 18.3MVA reduction required to achieve this deferral is high in absolute terms and relative to the system load. The deferral value for each of the scenarios described above are summarised in the following table.

SOPA need in:	Required demand reduction	Total saving (real 2010 dollars)	$/kVA
Summer 14/15	18.3MVA	$3.4 million	184
Summer 15/16	25.8MVA	$5.7 million	220
Summer 18/19	36.3MVA	$11.7 million	322

Given the high demand reduction requirement and moderate savings from deferral, it is not considered reasonable to expect that demand management options could enable implementation of an alternative lower cost supply side solution.

However, it has been identified that there is approximately 6.0MVA of load at risk in summer 2012/13, prior to the expected completion date for the proposed supply side solution. Analysis indicates that the value of reducing this risk completely is

approximately $600/kVA, so it is likely that demand management options could cost effectively mitigate all the risk in that season. Given the high uncertainty around demand forecasts for summer 2012/13 at this point in time, it is recommended that this opportunity be re-analysed after the latest summer forecast is released in the second half of 2011.

Recommendation

Based on this analysis it is not considered reasonable to expect that it may be cost-effective to enable an alternative, lower cost supply-side solution by implementing demand management strategies.

However it is likely to be cost effective to implement demand management options to reduce load at risk in summer 2012/13. It is recommended that this opportunity be reviewed when the latest summer demand forecast is released in the second half of 2011.