

Is Your Cooling Tower Losing Water?

Remit

A major Melbourne CBD building was concerned with water losses from their cooling system. RMP AquaKlar were engaged to quantify the losses and provide remedial recommendations.

Methodology

Water meter data was not available. Actual water losses were therefore calculated based on water chemistry and known tower design data and operational characteristics. These could then be compared to a 'best case' scenario to allow for an informed decision regarding the most cost effective remediation strategy.

Findings

The cooling tower was located on the building roof in an exposed location.



Significant water losses – water 'blown' out of the tower

Date	Make Up Quality (From City West Water)		Cooling Tower Data		Calculated Cycles of Concentration		Max Cycles of Conc	
	TDS	Chloride	TDS	Chloride	TDS	Chloride	TDS (@1200max)	Chloride (@ 300max)
04-Feb	74	18	480	200	6.5	11.1	16.2	16.7
17-Mar	74	18	405	235	5.5	13.1	16.2	16.7
31-Mar	74	18	385	475	5.2	26.4	16.2	16.7
15-Apr	74	18	445	165	6.0	9.2	16.2	16.7
28-Apr	74	18	460	180	6.2	10.0	16.2	16.7
13-May	74	18	505	195	6.8	10.8	16.2	16.7
26-May	74	18	535	215	7.2	11.9	16.2	16.7
10-Jun	74	18	225	100	3.0	5.6	16.2	16.7
23-Jun	74	18	555	210	7.5	11.7	16.2	16.7
08-Jul	74	18	790	205	10.7	11.4	16.2	16.7
Median:	74.0	18.0	470.0	202.5	6.4	11.3	16.2	16.7

Summary of Water Chemistry

During the site visit it was evident the cooling tower was subject to water losses due to water being blown out of the tower basin even when only a moderate wind was blowing.

The water treatment service reports were reviewed and tabulated for the previous 12 months.

Based on this data and tower characteristics the water losses were estimated and then compared with design.

Conclusion

It was calculated **over 160 tonnes of water** was being lost from the cooling tower every year. Replacement of the splash eliminators proved to be a cost effective solution with a **pay back** period of **less than 2 years**. The repair also improved the environmental credentials of the building.

	AquaCool	AquaCool
Make:	MSS080A	MSS080A
Model:	42	42
Design Flow (L/sec):	29.5	29.5
Design Inlet Temperature (oC):	35	35
Design Outlet Temperature (oC):	965.58	965.58
Estimated Max Heat Rejection (kW):	0.3	0.3
Maximum evaporation rate (L/sec):	1,500	1,500
Hrs per year operation:	58%	58%
Operational loading	909	909
Operational Evaporative water usage (m3/yr)	5	16
Cycles of Concentration:	1,136	969
Calculated Water Makeup Rate (m3/yr):		

Water Loss Calculations