



## Case Study

Thermax Chemicals is one of the leading water treatment chemical suppliers. Headquartered at Pune, in India, Thermax has global sales of its high quality chemicals.

### Background

A cooling tower is a heat rejection device which extracts waste heat from the plant processes and through cooling of the heat extracting water stream to a lower temperature, releases waste heat to the atmosphere. The type of heat rejection in a cooling tower is termed "evaporative" cooling as it allows a small portion of the water being cooled to evaporate into a moving air stream to provide significant cooling to the rest of that water stream. However because of evaporation, water quality decreases and also causes scales, corrosion, fouling, and microbiological contaminations.

To counter these effects, most water treatment chemical suppliers provide a number of chemicals for treating corrosion, scaling, fouling, and microbiological problems. They dose these chemicals based on adhoc measurement of process parameters such as pH, conductivity, etc., or through a PLC programme at regular intervals.

### Challenge

These conventional dosing systems have the following limitations:

- System takes time bound as opposed to need based "blow downs" and "feed" cycles of water
- No application based logic control
- No real time monitoring of water quality
- Measurements such as corrosion & fluorescence are not possible
- PLC integration done with different sensors and electrical switch gears
- Chemical consumption is fixed and normally not as per requirement
- Require significant manpower to keep testing all parameters

### Solution

To overcome these limitations of the conventional method, a dynamic automatic chemical treatment controller Web Master One from Walchem, USA, is installed on a cooling tower at Thermax. The Web Master One is a revolutionary solution for managing cooling water chemical dosing.

#### How does it work?

- "Web Master One" determines and measures on-line the key parameters like pH, ORP (oxidation reduction potential), conductivity, etc.
- Based on input parameters, controller system takes appropriate corrective actions online like feed, blow down, etc.
- Communicates the accurate process value to the users, to permit proper follow-up and troubleshooting
- Fluorometer (the little dipper) sensor is a single-channel fluorometer, which is installed directly into the process stream. It provides a 4 – 20 m signal output proportional to the concentration of the fluorophore being measured. It is used with data collection of systems to monitor and control the level of treatment chemicals to be used.
- Corratator sensor measures the instantaneous corrosion rate and pitting tendency in conductive liquid by electrochemical technique of linear polarization.
- Remote communications will provide notifications and online monitoring and a portal by which the conditions of the controller in the cooling tower can be viewed.



Walchem WebMaster® ONE



Walchem WebMaster® ONE at Thermax

## Result

- Reduction in chemical dosage by 22%
- Increase in cycles of concentration (COC) to 4 - 5 as compared to 2.5 - 3.5 COC with the old method; this has resulted in around 30% reduction on blow down water
- Elimination of fouling and scaling costs
- Elimination of chemical cleaning costs, reduction in down time and maintenance cost by over 30%
- Automatic triggering of system status reports and data-log files at periodic intervals
- Reduction of building infrastructure cost by conserving water, energy and chemicals
- Significant reduction in manpower to test parameters