CASE STUDY

THERMAX

Advanced Cooling Water Treatment for First-of-its-kind Order

Overview

A leading manufacturer of starch derivatives having a specific requirement of water savings in plant was approached by Thermax to conduct water balancing survey in plant along with our channel partner- Technochem Engineers. We conducted a walkthrough audit to understand water circuit and to know the actual consumption of water in cooling tower & other utilities.

Customer was using raw water as a makeup of cooling tower. After the analysis of RO reject water, it was recommended to use that water as cooling towers make up water with Thermax cooling water chemicals.

Challenges

Customer was using raw water as a makeup of cooling tower and was facing biological fouling in heat exchangers and wanted to improve COC.

Major difficulty was having steady operations which required strong program to tolerate high TDS/ chlorides, organic fouling, recycle stability and load reduction on ETP.

Make Up Water Parameters

Parameter	Thermax Used RO Reject Rater (50KL)	Existing Supplier Used Raw water
pH	8.0	7.0 – 7.5
TDS (ppm)	562	198
T-Hardness (ppm)	495	105
T-Alkalinity (ppm)	350	110
Cl (ppm)	55	10

Cooling Water Parameters

Parameter	Thermax Used RO Reject Water (50KL)	Existing Supplier Used Raw Water
pH	8.0	7.7
TDS (ppm)	1126	558
T-Hardness (ppm)	1020	380
T-Alkalinity (ppm)	160	80
COC	5.0	2.4

Thermax Solution

For scale & corrosion inhibition, Maxtreat-7770 and Maxtreat-7015 were suggested.

Maxtreat Cl-5 was used as bio-dispersant to control biological growth.

Biocides: Maxtreat-652 and Maxtreat-7960 were provided to tackle organic fouling.

Comparative Analysis

Biological Load

Plate-type Heat Exchanger (PHE) Before Treatment

Plate-type Heat Exchanger (PHE) After Treatment

Water Savings

Parameter	Thermax	Existing Supplier
Blowdown (M^3/Day)	69	183.7
Water savings (M^3/Day)	115	0.0
Make up water (M^3/day)	344.5	459.2
COC	5.0	2.5

Result

Thermax operated cooling tower on very high hardness and TDS without any issues of deposition in condenser with advanced CWC treatment obtaining following results:

- 50 m^3/day RO reject taken for makeup
- COC improved from 2.5 to 5.0
- PHE fouling tendency reduced drastically
- Economical treatment program

Benefits

Thermax Chemicals Treatment	Existing Supplier Chemicals Treatment
Used 50 KL/day RO reject in CT	Used raw water in CT
Increase the COC from 2.5 to 5.0	Maintain COC- 2.5 in CT
Physically found no biological growth in cooling tower	Observed slime & algae formation in CT
Run the cost effective treatment over existing treatment	Higher treatment costs
Maintain the water balance in plant by using the RO reject in cooling towers	Using raw water