Integrating green solutions for Cooling Systems at

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COOLING EFFICIENCY TECHNOLOGIES

SBR
The Non-Chemical Water Treatment for Cooling Tower

Case Study by CET Enviro

Cognizant, Chennai – Water Treatment

Details of Cooling Tower Treatment before SBR & Problems

- Total Cooling Tower capacity – 1125 TR x 5 Nos.

- RO Water was used as Make up in Cooling Towers.

- 6 Types of Chemicals were used

1. Acid
2. Caustic
3. Anti Scalant
4. Anti Corrosion
5. Oxidising Biocide
6. Non-Oxidising Biocide

- Blowdown water was send to STP Treatment where the chemicals in water were decreasing efficiency of STP.

- Cooling Tower was running on lower conductivity meaning huge Blowdown.

- Water Scarcity in Chennai meant that they had to use their Air Cooled Chillers to cater the peak demand which meant high energy consumptions.

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3 x SBR 2000 were commissioned in January 2020.

LSI Calculation – During Start of SBR

LSI analysis at the time of installation

Immediately after installation we got all water sample tested and did the LSI calculation (shown below)

Observation

- The makeup water normal water and the STP water is *Acidic in Nature with Negative LSI* which shows the nature of water to be corrosive. After the SBR electrolysis the water is converting to basic with a positive LSI making the entire system safe to work.

Cognizant Technology Solutions - Chennai						
Tested in - Chennai Metex Lab Pvt Ltd						
Date of Collection of Sample - 10/12/2019						
Date of Submission of Sample - 11/12/2019						
Date of Completion of Test - 18/12/2019						
Water	pH	Conductivity	Ca2+	HCO3-	Water temperature	**LSI**
Name		Micro S/cm	mg/L	mg/L	°C	
Cooling Tower	8.86	4420	155	408	25	**1.4**
SBR Outlet	8.67	4110	147	388	25	**1.2**
Makeup Normal	7.67	513	46	198	25	**-0.14**
STP	6.7	2460	91	151	25	**-1.2**

Report-1

STP AS MAKE-UP WATER

0% in beginning

100% Now

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Cooling tower – BEFORE & AFTER SBR

Take Away:- Cooling tower basin having algae in large content since beginning gradually getting clean with the SBR Operation

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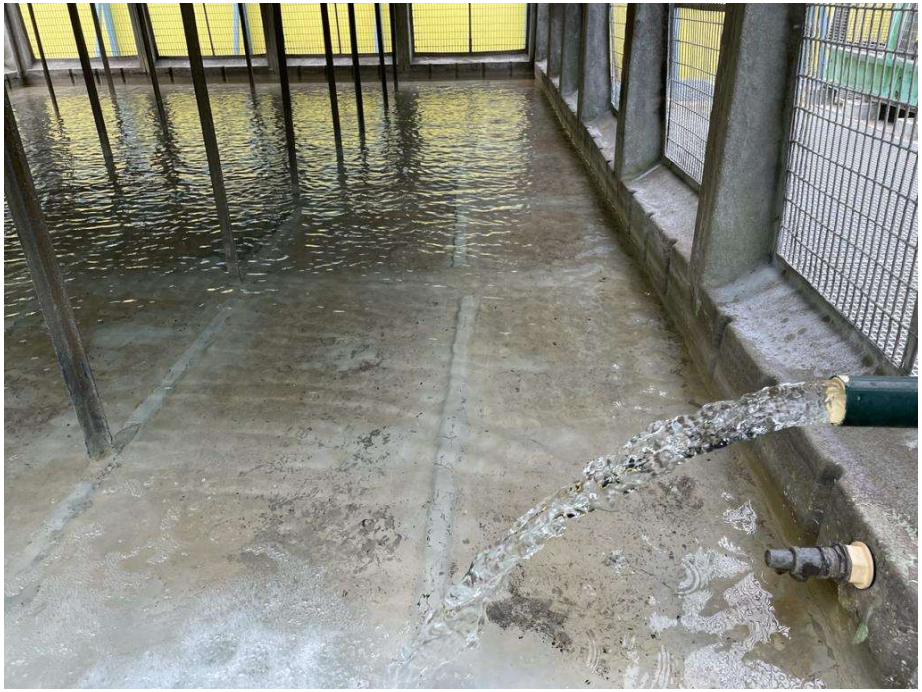
Cooling tower – AFTER 8 weeks of SBR



Take Away:- 8 weeks post commissioning of the SBR cooling towers became completely clean with no signs of Scaling, Fouling & Corrossion

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LSI Calculation for Cooling Tower water with SBR

Observation

- The cooling tower water after electrolysis though the Conductivity has reached the double mark to the previous one the LSI is 0.7 which is basic and well saturated water.

Cognizant Technology Solutions - ELCOT Sholinganallur Chennai						
Tested in - Care Laboratories						
Date of Collection of Sample - 30/1/2020						
Date of Submission of Sample - 30/1/2020						
Date of Completion of Test - 3/2/2020						
Water	pH	Conductivity	Ca2+	HCO3-	Water temperature	**LSI**
Name		Micro S/cm	mg/L	mg/L	°C	
Cooling Tower	7.95	7884	176	830	25	**0.7**

Report-2

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ADVANTAGES & SAVINGS – ACHIEVED

NO CHEMICALS USAGE – INCREASED WORKPLACE SAFETY.

WATER SAVINGS & CONSERVATION.

REDUCED MANUAL INTERVENTION

STP WATER USED AS MAKE UP – (100% WATER SAVINGS)

INCREASED COOLING TOWER PERFORMANCE

ENVIRONMENT FRIENDLY

ENERGY SAVINGS of 19.35 Lacs by SBR per year

Rs 30 Lacs Saving on Chemicals Usage yearly

Yearly WATER SAVINGS of 39,638 KL

Award Received from CII in August 2021

ACHIEVED TOTAL SAVINGS Rs 87.40 Lacs every year

A Presentation by: