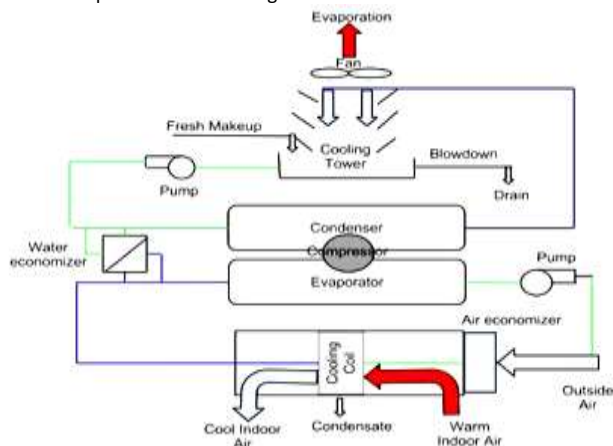


**JUSCHEM Presents 2 days Highly Interactive workshop on
“Dynamics of Cooling water Treatment, heat transfer monitoring across heat exchanger/condenser
and cooling tower”**

Introduction

This training has been developed to assist facility managers with the operation of their cooling water systems and to improve their understanding of the water/energy nexus with the goal of reducing energy, water and chemical consumption of the cooling systems through improved operations. By reinforcing strong operational practices, introducing new concepts and raising overall awareness of cooling tower operations, it is expected that a system will more likely be operated at or near peak efficiency. Evaporative cooling towers are very popular as they provide the most cost effective cooling technology for condenser cooling, commercial air conditioning and industrial processes. In spite of these concerns, treatment and control of cooling tower water is commonly neglected, which is then responsible for substantial problems due to downtime, equipment damage, loss of process control, high water use, environmental violations, safety hazards, and increased energy usage. This training is intended to provide the cooling water user with a advanced knowledge of cooling water management so that problems resulting from corrosion, scale, deposition, and biological fouling can be avoided. Reduction of operating costs from increased efficiency in use of energy and control of both makeup water and sewerage use will be discussed.



The training seminar will feature:

- Water Chemistry and understanding the propensity of scale and corrosion
- Heat Transfer monitoring across heat exchanger/condenser and understanding the effect of deposit or scale formation
- Heat Transfer monitoring across cooling tower and RCA
- Effect on energy consumption in HVACs due to a thin layer of scale or biofouling or bad tower performance
- What to monitor, what should be the KPI or leading indicators for to understand efficiency of heat transfer systems
- Reaching higher COC to save water and chemicals

Training Methodology

This training seminar will be conducted along workshop principles with formal lectures and interactive examples, which will result in the active participation of all delegates. There will be ample opportunities for active, open discussions and sharing professional experiences on various industrial applications.

Objectives

By the end of this training seminar, the participants will be able to:

1. Identify leading indicators of heat transfer inhibition and can take proactive action to avoid costly shutdowns or equipment failures, and the impact on plant reliability
2. Understand the cost-effectiveness of Preventive/Predictive Maintenance program through chemistry applications
3. Apply techniques of optimisation of water consumption
4. Make the important decision on the basis of the cost and benefit analysis
5. Create monitoring systems with trending to assess the cooling water treatment

Organizational Impact

On completion of this seminar the delegates will be able to analyze the operation and maintenance of various dynamics within the cooling water system and water chemistry and suggest potential improvement in saving energy, fuel, water and most importantly life of equipment where required.

The knowledge gained in this seminar will:

1. Enable the delegates to optimize the energy/fuel consumptions in HVAC, Condenser or any heat exchanger are directly impacting energy consumption.
2. Give the delegates skill to analyze efficiency and effectiveness of cooling water systems and heat exchangers
3. Reduce Corrosion, biofouling/algae or scale formation in cooling water system
4. Give better insight to the increase life of heat exchangers
5. Avoid downtime of production due to scale corrosion or bio-fouling

Personal Impact

1. Improved confidence when solving problems of heat transfer
2. Better understanding of how optimized the circulating water treatment
3. Better knowledge of heat transfer
4. Improved personal skills of taking proactive action
5. Better ability to troubleshoot difficult situations

Who Should Attend?

This training seminar is suitable to a wide range of professionals but will greatly benefit:

1. Operation, technical production & service professionals
2. Technical professionals responsible for maintenance and repair of equipment
3. Professionals involved in inspection and reliability
4. Technical professionals dealing with risk assessment and integrity analysis
5. Technicians dealing with regulating and metering and other measurements
6. Water Chemistry / Power Plant Chemistry professionals
7. Centralized AC/HVAC operation incharge

Agenda

Day 1

- Cooling Tower Operations Checklist
- Cooling Water Systems
- Typical Cooling Towers Components
- Measuring Performance
- Operation
- How Water is used in a Cooling Tower System
- Relationship between Makeup, Blowdown, Evaporation and Drift
- Relationship Between Cycles of Concentration and Makeup Demand
- Water Treatment Requirements
- Chemicals
- Monitoring Your System
- Water Quality
- System Concerns
- Maintaining Equipment
- Maintenance Checklist
- New Technology Introduction
- Stability indice calculator
- Terms and Definitions
- Types of cooling water systems
- Terminology and calculation method: blowdown (bd), makeup, (mu) cycles (c), windage (w), recirculation rate (r)
- Understanding corrosion and scale formation
- Water management program requirements
- Obtain maximum energy efficiency and equipment life by minimizing problems due to corrosion, scale, deposition, and biological growth
- Be cost effective considering the total water system capital and operating costs
- Water chemistry control
- The economics of cycles

Day 2

- Saturation index by hand calculator
- Methods for controlling cycles
- Chemical feed control
- Calculation of operating parameters
- Biological control
- Operator attention
- Corrosion
- Corrosion monitoring
- Corrosion inhibitor chemistry
- Soft water notes
- Scale
- Chemical scale inhibitors
- Ph adjustment
- Deposition
- Biological fouling
- Biocide chemistry
- Chemical program selection
- Zero blowdown which requires use of bypass filtration to control deposition.
- Vendor Management
 - Selecting a Vendor
 - Contract Types
 - Evaluating a Vendor
- Summary and discussion
- Heat Transfer across the cooling tower
- Heat transfer across heat exchangers
- Heat transfer across condensers
- Log mean temperature difference and its importance
- Overall heat transfer coefficient
- Monitoring of heat transfer efficiency across heat exchangers
- Monitoring of Cooling tower efficiency
- Relation with flow and pressure to the HT parameters
- Software to monitor heat transfer for prediction of scaling

Expert Profile Mr. S Banerjee – Mr. S Banerjee is a seasoned power plant Chemistry and water treatment professional with in-hand experience of 25 yrs after passing M.Sc. Applied Chemistry from Government Engineering College, Jabalpur in 1995. He has worked with India's Pioneer Water Treatment Company and with Giant Private Power Generators in India viz. Tata Power, Adani Power, Jindal Power, LPGCL as HOD Power Station Chemistry and Environment. He has both experiences of sub critical and super critical power plants, commissioning-O&M and troubleshooting of water treatment plants, boiler water, cooling water, stator water and waste water. He was also associated with a reputed Institute of Power Technology as a faculty on Water treatment and Power Plant Chemistry. He has presented many papers on water treatment, power plant chemistry and water management in national seminars and magazines and also **written a Book "Practical Guide to Thermal Power Station Chemistry"**. He has trained more than 1000 industrial professionals in last 900 days.