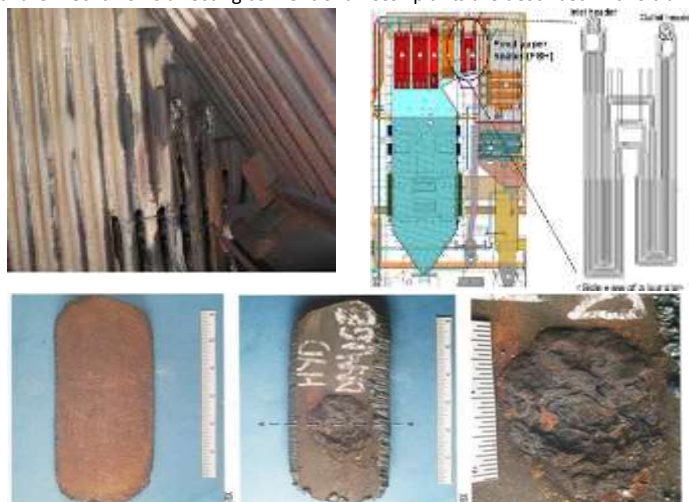


**JUSCHEM Presents 2 days Highly Interactive workshop on
“Causes, Identification and Mitigation of Boiler Tube Failure”**

Introduction

This is a two-day training course intended principally for engineers who are directly involved in the strategic management of boiler tubes, whether operationally or commercially, but it is of value to anyone concerned with maintenance or operational aspects of boiler tube failures. This course is will impart understanding on the principles of BTF management with respect to both the safe operation and availability of plant and the impact of operational changes on tubing integrity that ultimately influence maintenance planning. In conventional and combined-cycle plants, boiler tube failures (BTFs) have been the main availability problem for as long as reliable statistics have been kept for each generating source. Training on Boiler Tube Failure Mechanism and their Prevention involves an in-depth discussion of the various BTF and degradation mechanisms, providing plant owners and operators with the technical basis to address tube failures and create permanent solutions. Tube failures emanate from poor initial design, poor operation and maintenance, harsh fireside and cycle chemistry environments, and lack of management support for comprehensive reduction programs. A total of 35 tube failure mechanisms affecting conventional fossil plants are described in this training.



The training seminar will feature:

- 35 Mechanism of Boiler tube failures
- Correlate past failure with the pictures
- Corrective and Preventive action
- What to monitor, what should be the KPI or leading indicators for to understand the potential of BTF

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 cause of boiler tube failure 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 field monitoring
3. Apply techniques of inspection
4. Understanding will be developed for different damage mechanisms prevailing in boiler tube failures.
5. Gain a valuable working understanding of fundamental principles of degradation that occurs in short term and long-term operation of boilers.
6. Knowledge to increase the problem-solving attitude and take the first hand judgment on the boiler tube failures.
7. Attitude to analyse the difference in metal behaviour helps to decide better mitigation to the persistent boiler tube failure.
8. Achieve the knowledge required to conduct or supervise basic failure investigation.

Organizational Impact

Invention to improve reliability of company operations, cost savings, increase profitability. Tube failures occur in new and old units; in units that cycle and those that operate under base-load conditions; in supercritical, once-through, and drum units; and in units burning every sort of combustible material. The information and comprehensive approach presented will help organizations to approach and achieve world-class performance. On completion of this seminar the delegates will be able to analyze the various dynamics of Boiler Tube Failures and will be able to suggest corrective and preventive action to avoid costly downtime and improve life of equipment where required.

The knowledge gained in this seminar will:

1. 35 Boiler Tube failure mechanisms
2. Correlation with the environment (coal/ash/water)
3. Give the delegates skill to analyze the type of BTF and take preventive action
4. Give better insight to the increase life of Boilers
5. Avoid downtime of production due to BTF

Personal Impact

1. Improved confidence when solving problems of Boiler tube failure
2. Better understanding of what is impacting these failures
3. Better knowledge of Field Inspection methodologies
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. Mechanical Engineers of middle management level
2. Maintenance / Inspection Engineers
3. Process engineers
4. Boiler inspectors
5. Plant Engineers / Managers
6. QA / QC Engineers
7. Reliability Engineer
8. Metallurgical / Materials Engineers
9. HAZOP Engineers / Managers
10. Water Chemistry / Power Plant Chemistry professionals

Agenda

Day 1

- Introduction
 - Background
 - Purpose
 - Scope
- Tube Failure Mechanisms
 - Water-Touched Tubes
 - Screening Table for Water-Touched Boiler Tube Failures
 - Corrosion Fatigue
 - Fly Ash Erosion
 - Hydrogen Damage
 - Acid Phosphate Corrosion
 - Caustic Gouging
 - Waterwall Fireside Corrosion
 - Thermal Fatigue in Water-walls
 - Thermal Fatigue of Economizer Header Tubes
 - Thermal-Mechanical and Vibration-Induced Fatigue in
- Water-Touched Tubes
 - Thermal Fatigue Caused by Water Blowing
 - Flow-Accelerated Corrosion in Economizer Inlet Header Tubing
 - Soot blower Erosion in Water-Touched Tubes
 - Short-Term Overheating in Water-wall Or Evaporator Tubing
 - Low Temperature Creep Cracking
 - Chemical Cleaning Damage: Water-walls
 - Pitting in Water-Touched Tubes
 - Coal Particulate Erosion
 - Falling Slag
 - Acid Dewpoint Corrosion
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Day 2

- Steam-Touched Tubes
 - Screening Table for Steam-Touched Boiler Failures
 - Longterm Overheating/Creep in SH/RH Tubes
 - Fireside Corrosion in SH/RH Tubes SH/RH Fireside Corrosion
 - Dissimilar Metal Weld Failures
 - Short-Term Overheating in SH/RH Tubing
 - Stress Corrosion Cracking in Steam-Touched Tubes
 - Sootblower Erosion in SH/RH Tubes
 - Explosive Cleaning Damage in SH/RH
- Steam-Touched Tubes Continued
 - Thermal-Mechanical and Vibration-Induced Fatigue in Steam-Touched Tubes
 - Rubbing/Fretting
 - Pitting in Steam-Touched Tubes
 - Graphitization
 - Chemical Cleaning Damage in SH/RH Tubes
 - Maintenance Damage
 - Material and Manufacturing Flaws
 - Welding Defects
 - BTF Issues in Bubbling Bed FBCs
 - BTF Issues in Circulating Bed FBCs
- Fundamentals of Field Inspection
 - Safety
 - Tools.
 - Foreign Material Exclusion
 - Where to Look
 - What to Look for
 - Documentation.
 - Trending
 - Just Look Around

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."**

Few topics of Published Papers in International forums:

1. Reaching High COC in cooling water system to save water, energy and chemicals,
2. Flow Accelerated Corrosion and its prevention (emphasizing Oxygenated Treatment) and monitoring,
3. Monitoring of heat transfer in cooling water systems.
4. Significance of water and steam purity in Thermal Power Plant
5. Advanced Method to optimize RO membrane performance
6. Proactive Lead Fouling Indicator for all types of membranes
7. Using sensor data analytics – predictive modeling for improved effectiveness in Thermal Power Stations
8. Developing Organization Strategic Intents to Achieve Business Excellence through Hoshin Kanri Concept
9. Tracking, Tracing and Theft Evading: New Technologies Of Governance And The Mining Logistics Industries – Mining Industry