

BOILER WATER TREATMENT, ANALYSIS, DEMINERALIZATION AND DESALINATION

Course Objectives

Gain an understanding of the techniques of boiler water treatment/desalination and analysis. This will include sections on basic chemistry, filtration, purification and cooling systems, as well as practical water testing.

Course Description

This course has been designed to provide a broad overview of the water treatment process necessary for most industrial uses and for the power generation industry in particular. The course will discuss in detail the various options and parameters as regards water treatment.

Who Should Attend

This course is primarily aimed at those in the Power Generation industry who require an understanding of the techniques of boiler water treatment/desalination and analysis. All Attendees should have a sound chemical and engineering background.

Course Outcome

At the end of this course you will be able to understand

- Boiler water treatment
- Basic chemistry
- Filtration
- Purification and analysis
- Water testing methods
- Desalination
- Demineralization

Course Outline

Day 1

Introduction

Overview

- Steam generation and boiler water treatment
- Basic Water Chemistry
- Water sources, impurities, and chemistry
- Water Analysis in a boiler treatment context
- Pre-treatment essentials
- Overview of technologies to prepare feed water
- Filtration
- Ion-exchange (softening ; demineralisation)
- Reverse Osmosis & other membrane systems
- Electrodionisation (EDI)
- Boiler Water Treatment Internals
- Feed water and boiler water quality guidelines: ASME & ABMA ; EPRI
- Impact of water treatment plant performance on boiler chemistry
- Low pressure vs. high pressure boiler chemical treatment (chelants, phosphates, other)

Day 2

- Coordinate phosphate-pH control
- Phosphate treatment, equilibrium phosphate treatment
- All volatile treatment, other treatment philosophies
- How to evaluate phosphates (bid selection)
- Use of boiler water test equipment covering the following parameters
- Ion Exchange
- Resin Exhaustion
- Regeneration
- Degasifiers
- Filter demineralisation
- Steam Purity
- Carryover – effects and causes, prevention
- Steam purity guidelines
- Measurement of steam purity (best practice)
- Steam turbine deposition, erosion, corrosion
- What is cation conductivity? Its pros and cons
- Steam sampling

BOILER WATER TREATMENT, ANALYSIS, DEMINERALIZATION AND DESALINATION (REF:OTSWTBA001)

Day 3

- Cooling Water Treatment
- Corrosion
- Erosion
- Scale
- Biological Fouling
- Chlorine Injection Systems
- Desalination technologies
- Thermal/membrane
- Fouling and cleaning of desalination plant
- Water testing
- Electrochlorination
- Course Review and Feedback