



Operation & Maintenance of Ion Exchange, Reverse Osmosis/Ultra Filtration

CREATIVE CONCEPTS



Water Treatment Plant Design

Johannesburg 13th - 17th May 2024

R10,000.00 Per Delegate

This course is designed in consideration with the requirements of Water Treatment Plant Chemists, Operators, Design & Project Engineers and Maintenance Engineers and Technicians at:

- Electricity Generation Power Plants (Thermal Power Plants)
- Textile Industries
- Paper and Pulp Industries
- Food and Beverages
- Hotel and Corporate Sectors
- Municipal Water Purification Plants and Distribution Companies

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- **Water Treatment Plant Laboratory**
- **Chemists**
- **Water Treatment Plant Engineers**
- **WTP Formans/Supervisors**
- **Design/Project Engineers**
- **Maintenance Staff**
- **Any Other Engineers who are Interested in Understanding the Design and Operation/Maintenance of Water Treatment Equipment.**



5 Day CPD Certified Training



CREATIVE CONCEPTS

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TRAINING OBJECTIVES

By attending this Course for this extensive duration, the participants will get knowledge of:

- How to assess/Analyse the existing Water Treatment Plant Performance that they have,
- How to design or check the existing Plant Design and validate,
- How to design: Clarifiers, Sand and Activated carbon filters, Ion Exchange Caution/Anion/Mixed beds units and Reverse Osmosis Units,
- How to understand the exact sizing, designing and maintenance aspects of the WTP expansion needs,
- How to improve performance (saving of manpower and operation costs) of any Ion Exchange/Reverse Osmosis Plant.
- How to be aware of the environmental facts of any water treatment plant.
- Introduction of Zero Liquid Discharge and Effluent Treatment Methods of Waste Water



TRAINING METHODS

The course has been designed to roughly have a 50-50 split between theoretical and practical sessions. Modern training techniques are utilised, and delegates are encouraged to use this opportunity to learn as much as possible, in an environment conducive to the sharing of knowledge. The material is of such a nature, that the descriptions flow freely, and questions are encouraged at any time. Every major section of the work is followed by a typical practical session which may be found to be useful in a water treatment plant.

Delegates will be provided with extra material on hard drives pertaining to the subject matter which can be used to hone skilled acquired during the workshop. At the end of each day, an additional wrap-up session is included, to ensure full understanding of all course material covered. All practical exercises will be tailor-made to ensure that it ties in within the line of work of the delegate.

SEMINAR OUTLINE

Day One : The Water Chemistry in details

- What Is water, its Source and Characteristics
- The Physical, Biological and Chemical impurities of water
- The Water Analysis and its interpretation
- The mg/l and ppm what is it? and meaning of mg/l as CaCO₃ (with Exercise)
- Langelier Saturation Index (LSI) and scaling potential of water
- Brackish and Saline water
- pH, its measurement and relation with mg/l of Alkali and acids (with exercise)
- pH and Alkalinity relations, what is P and M alkalinity ?
- Alkalinity and hardness Relations
- Temporary and permanent hardness
- Hardness and Total Dissolved Solids relation

Day Two

Day Two

- The Coagulation and flocculation of Raw water
- The equipment needed for settling/Clarifying of Water
- The Design of Clarifiers including the Flash Mixers, Flocculation Chamber and Clarifier
- The Design Of Sand filter and the significance of Sand Under bed layering.
- The Design Of Activates Carbon filters and the Under bed Layering, significance of Activated Carbon Iodine Value and Adsorption capacity
- The Ion Exchange resins their structuring and difference in Cation and Anion resins
- Design Of Softners, Cation/Degasser/Anion Exchangers

Day Three^{dy}

Day Three

- The Internal Distributors Of Filters and Ion Exchange Units and their design
- The Design of Mixed bed Ion Exchange Units
- The design of Weak acid and Weak base ion Exchangers
- The Maintenance of Ion Exchangers and resin Cleaning
- The Symptoms of Resin fouling with Biological /Chemical foulants
- Different Regeneration methods with different Chemicals (HCl or H₂SO₄) and their impacts on Water quality and Saving of Chemicals (OPEX), the use of ventury ejection systems in Ion Exchange resin Regeneration

- How to minimize the waste water generation per regeneration
- The Function and application of Programmable Logic Control system(PLC) in Ion Exchange Plant Automatic Operation

Day Four

- What Is membrane Technology ?
- The Development of membrane Technology in 20th Century and its importance in Water treatment Industry
- The membrane V/S particle size Spectrum
- The Micron, Ultra, Nano and Hyper Filtration.
- Membrane Materials
- Reverse Osmosis membrane Configuration and Modern RO membrane material
- The Osmosis and Reverse Osmosis Explained
- The Ultra Filtration membrane Configuration and explanation of IN to OUT or OUT to IN UF configuration and Cross flow V/S Dead End Filtration
- FLUX and Membrane Area and it's impact on Membrane system Design.
- UF plant design
- Reverse Osmosis Plant design and understanding the meaning of Beat factor on last elements, SDI,LSI,the Flux and Area of membrane, Salt passage and Membrane rejection
- That is benchmark performance for Comparison of RO Plant performance deviation Study
- The RO Plant Design with the help of RO Software (Hydranautics or Filmtec)
- The various Aspects and Configuration of RO Membrane Arrangements (Staging and Passes)
- Design of BWRO

Day Five^{VRO}

Day Five

- The Discussion of Important design Aspects of RO Plant
- The Control system of RO plant, LPS/HPS and Control Valve design with CV value
- Maintenance of RO Plant
- Chemicals Cleaning for UF and RO plant
- Dosing Chemicals and Dosing Pump Calculations
- Overview of total Course and Clarifications
- Case study of participant's WTP Plant
- Q and A
- Feedback and Certificates.





CREATIVE CONCEPTS

REGISTRATION FORM

Authorising Person:

First Name:
Surname:
Company / Organisation:
Designation:
Phone:
Fax:
Email Address:
Company VAT NO:
Postal Address:
Postal code:
Person dealing with accounts:
Country:
Email Address:

Date:

Signature:

By completing and signing this form, the signatory accepts the terms and conditions as stated on the registration form

SUBSTITUTIONS:

Delegate substitution is always welcome at any time and do not incur any additional charges. Please notify us in writing of any changes at least 3 days before the date of the event.
- Please note that the speakers and topics were confirmed at the time of publishing, however, circumstances beyond the control of the organisers may necessitate substitutions, alterations or cancellations of the speakers and/or topics.
- As such, CREATIVE CONCEPTS reserves the right to alter or modify the advertised speakers and/or topics if necessary. Any substitutions or alterations will be updated and sent to you as soon as possible.
- Delegate substitution must be made in writing 7 days before the start of the event.

PAYMENT BY MEANS OF BANK TRANSFER

- Please state your full names clearly on the money transfer.
- Please note bank charges are of your own account and this should be included in your deposit.
- A copy of the bank deposit receipt should accompany your registration form and must be emailed and faxed.

Water Treatment Plant Design

13th - 17th May 2024 2024 (Johannesburg)

Tel: 0739782513 sales@creativeconceptstraining.co.za

R10000

PER DELEGATE

Cost, excl VAT pp

Please complete and return this form

CANCELLATION NOTICE:

By signing and returning this registration form, the authorising signatory on behalf of the stated company is subject to the following terms and conditions:
- Charge of 50% of the registration fees, plus R700 administrative charge will be made for cancellations received within at least 14 working days prior to the event.
- For any cancellations received in less than 7 days before the date of the event, the full fee will be payable and no refunds or credit notes will be given.
- If a registered delegate does not cancel and fails to attend the summit, this will be treated as cancellation and no refund or



Registration fees include the following entitlements: Entrance to session, registration pack, daily lunch and refreshments breaks

Registration Fees above excludes the following Entitlements: Travel Costs and accommodation

Delegate Attendance Information:

NOTE: Please provide information as you wish it to appear on your name badge and on the official participant database

Table with 5 columns: Title, Delegate Name & Surname, Position, Email, Phone. The table body is currently empty.