TECHNICAL EDUCATION ACADEMY

Operational Risk Management Center

COURSE PROGRAMME

000673

HSSE099 - Efficient Water Treatment Operations: Diagnostics, Compliance, and Maintenance

In the dynamic and demanding oil and gas industry, efficient water treatment is a cornerstone of sustainable operations.



Learn from the Best in the Business!

Course overview

Duration: 5 days / 40 hours · Intermediate level

Why take this course

In the dynamic and demanding oil and gas industry, efficient water treatment is a cornerstone of sustainable operations. The Efficient Water Treatment Operations: Diagnostics, Compliance, and Maintenance training programme equips industry professionals with the technical knowledge and practical skills to optimize water treatment processes, ensuring compliance with environmental and safety regulations while maintaining operational excellence.

This comprehensive programme dives deep into advanced water treatment technologies such as membrane filtration, ion exchange, and UV disinfection, offering participants the expertise needed to diagnose and troubleshoot common system issues, from scaling and fouling to chemical imbalances. Participants will also gain valuable insights into preventive maintenance techniques, including condition-based monitoring and energy efficiency strategies, to enhance the longevity and reliability of water treatment systems.

Beyond operational efficiency, the programme emphasizes regulatory compliance and sustainable practices, guiding participants through the intricacies of local and international standards. Practical exercises and case studies simulate real-world scenarios, ensuring learners are equipped to address challenges in complex industrial environments confidently.

Whether you are a water treatment operator, process engineer, or HSE officer, this training programme provides the tools and knowledge to drive efficiency, ensure safety, and achieve sustainability in water treatment operations.

Who it is for and how it helps

This course is designed for professionals involved in water treatment operations within the oil and gas industry, including:

- Water Treatment Operators responsible for daily system operations and maintenance.
- Maintenance Technicians focused on system upkeep, repairs, and preventive maintenance.
- Process Engineers involved in designing, optimizing, and troubleshooting water treatment processes.
- HSE Officers overseeing compliance with environmental and safety regulations.
- Facility Managers managing the overall efficiency and sustainability of industrial operations.
- Project Engineers working on the implementation of water treatment systems in oil and gas projects.

What you will learn

- Explain key methods like coagulation, membrane filtration, and ion exchange in water treatment
- Calculate and apply cost-effective chemical dosing techniques for improved water quality
- Manage startup, shutdown, and daily operations of water treatment plants efficiently
- Utilize SCADA and other control systems for remote monitoring and diagnostics

Course overview — continued

- Identify and resolve common problems like scaling, fouling, and mechanical failures
- Create and implement schedules for equipment calibration, cleaning, and repairs
- Identify opportunities to enhance the energy performance of water treatment operations
- Navigate local and international water treatment standards and environmental guidelines
- Apply best practices for safe handling of chemicals and respond to contamination or system failures
- Implement waste management and sustainable water treatment strategies in line with industry standards

Curriculum

Modules 01–05

01 Fundamentals of Advanced Water Treatment

- Overview of water treatment processes and their importance in oil and gas operations
- Introduction to water quality parameters and measurement techniques
- Basics of water treatment technologies: coagulation, flocculation, sedimentation
- Fundamentals of filtration: sand, membrane, and activated carbon
- Role and mechanisms of UV disinfection

02 Membrane Technologies and Chemical Applications

- Reverse osmosis and ultrafiltration: design, operation, and troubleshooting
- Ion exchange systems: principles, applications, and limitations
- Chemical dosing: calculations, optimization, and safety protocols
- Controlling scaling, fouling, and biofilm in membrane systems

03 Operating and Automating Water Treatment Systems

- Startup, operation, and shutdown procedures for water treatment systems
- Pump and valve operations: types, maintenance, and troubleshooting
- Integration of SCADA and automation for remote monitoring and control
- Monitoring critical operational parameters: flow rates, pressure, and levels
- Handling storage tanks and reservoirs effectively

04 Diagnostics and Troubleshooting Techniques

- Identifying common issues in water treatment systems
- Diagnostic techniques for pumps, membranes, and filters
- Troubleshooting chemical dosing, scaling, and fouling issues
- Managing power outages, alarms, and system failures
- Tools and methodologies for root cause analysis

05 Preventive Maintenance and Optimization

- Creating a preventive maintenance schedule
- Cleaning and maintenance best practices for filters and membranes

Curriculum

Modules 05–06 · Module 05 — continued

- Monitoring and maintaining pumps, motors, and valves
- Cost-effective chemical usage and energy efficiency improvement strategies
- Condition-based monitoring and predictive maintenance techniques

06 Regulatory Compliance and Safety in Water Treatment

- Overview of water treatment regulations (local and international)
- Ensuring compliance with water quality and environmental standards
- Health and safety protocols for water treatment facilities
- Emergency response and risk management in water treatment
- Sustainable practices and waste management in water treatment

Programme instructor



Elsayed Absi

A highly experienced Mechanical Maintenance Leader, Reliability Specialist, and Technical Trainer with more than 35 years of international experience in the oil and gas industry, working across Nigeria, Egypt, Yemen, and Syria with major Oil and Gas Companies like ExxonMobil, Total, Shell, Spie. Throughout his career, he has held senior technical and leadership roles in maintenance management, reliability improvement, preventive maintenance optimization, shutdown planning, rotating equipment, and field operations support.

He brings deep practical knowledge of mechanical systems, maintenance strategies, spare parts management, SAP/CMMS, root cause failure analysis, inspection planning, and equipment integrity. His professional background combines both hands-on field expertise and strategic maintenance leadership, making his teaching highly practical, industry-focused, and relevant to real working environments.

Alongside his engineering and maintenance career, he has extensive experience as a classroom trainer and on-the-job instructor, where he developed training materials, prepared assessments, coached technicians and engineers, and supported workforce competence development. He is passionate about sharing knowledge with students and helping them build a strong technical foundation, understand real industrial practices, and develop the confidence needed for successful careers in mechanical maintenance and engineering.

His teaching approach focuses on linking theory with practical application, with special attention to safe working practices, troubleshooting, preventive maintenance, rotating equipment, hydraulic and pneumatic systems, and maintenance planning.

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Participant ratings

Programme evaluation based on participant feedback

Overall programme rating — 4.6 / 5

Clarity of learning objectives	**4.3 / 5**
Confidence in applying knowledge and skills	**4.4 / 5**
Achievement of learning objectives	**4.3 / 5**
Relevance of content to job tasks	**4.1 / 5**
Suitability of difficulty for the level of preparation	**4.1 / 5**
Increase in knowledge	**4.4 / 5**
Skills development	**4.4 / 5**
Willingness to recommend the programme to colleagues	**4.3 / 5**

20 responses

Joining the programme

Contact the Academy and quote course code 000673 to confirm dates, delivery format, prices and enrolment terms.

Training for your team

Tell us your business goals, the roles and number of participants, and your preferred dates and location. This will help us discuss the right training option.

Preparing for the programme

The published programme does not specify any prerequisites. Contact us before enrolling to confirm how to prepare.

Discuss your training needs

mail@tecedu.org
www.tecedu.academy

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