Oil Field Processing: Stabilization and Sweetening Operations

Course general description:

This intensive five-day training course provides comprehensive instruction on oil stabilization and sweetening operations in oil field surface facilities. The course focuses on the fundamental principles, equipment operation, process control, and safety protocols essential for producing on-spec crude oil and gas products. Through a combination of theoretical knowledge and practical applications, participants will develop the skills necessary to operate and monitor stabilization and sweetening processes effectively while maintaining safety and quality standards.

Audience:

This course is designed for:

1. Oil and gas process operators
2. Production technicians
3. Field operators
4. Operations trainees
5. Junior process engineers
6. Maintenance technicians transitioning to operations

Course objectives:

1. Understand the principles of crude oil stabilization and gas sweetening processes
2. Operate and monitor stabilization columns and sweetening units
3. Control process parameters for optimal performance
4. Implement sampling and testing procedures
5. Apply safety protocols in handling hazardous materials
6. Troubleshoot common operational issues
7. Maintain process documentation and records
8. Respond to process upsets and emergencies

Course duration:

5 days

Course location:

Cairo-Dubai-Istanbul

Course contents:

Day 1: Fundamentals of Oil Stabilization

- Basic Concepts – Introduction to crude oil properties, vapor pressure, and phase behavior.
- Product Specifications – Understanding RVP and quality requirements for stabilized crude.
- Stabilization Process – Overview of stabilization principles, process types, and flow diagrams.
- Key Operating Parameters – Importance of temperature, pressure, and equipment in stabilization.
- Practical Exercises – RVP measurement, phase behavior demonstrations, and case studies.

Day 2: Stabilization Equipment and Systems

- Stabilization Columns – Design, internals, tray vs. packed columns, and reflux systems.
- Supporting Systems – Heat exchangers, condensers, pumps, compressors, and storage.
- Pre-Heating & Feed Systems – Importance of feed conditioning and energy efficiency.
- Control and Performance – Key operational challenges and troubleshooting techniques.
- Practical Exercises – Equipment troubleshooting, control loop demonstrations, and case studies.

Day 3: Gas Sweetening Fundamentals

- Sour Gas Processing – Principles of H_2S and CO_2 removal, amine system overview.
- Chemical Reactions – Key reactions in absorption, regeneration, and treatment.

- Sweetening Equipment – Design of absorption columns, reboilers, and filtration systems.
- Safety & Environmental Considerations – Regulations, emissions control, and risk mitigation.
- Practical Exercises – Amine testing, equipment monitoring, and safety drills.

Day 4: Process Control and Optimization

- Control Fundamentals – Process control theory, key variables, loops, and instrumentation.
- DCS Operations – Digital control systems, interface management, and automation.
- Optimization Strategies – Energy efficiency, quality control, and performance monitoring.
- Troubleshooting & Diagnostics – Common issues, fault identification, and solutions.
- Practical Exercises – Control system simulations, optimization exercises, and case studies.

Day 5: Safety and Quality Management

- Process Safety – Hazard identification, PPE, and emergency shutdown procedures.
- Environmental Compliance – Regulations, emissions monitoring, and sustainability.
- Quality Control Systems – Ensuring consistency in crude stabilization and sweetening.
- Final Assessment – Written exam, course evaluation, and knowledge review.
- Certification & Closing – Presentation of certificates and feedback session.

Methodology:

- 50% lectures & concepts
- 10% Videos
- 15% Case studies
- 15% Exercises & Quizes.
- 10% Discussions

Course code: (TPR0019)