Sour Gas Sweetening Units: Comprehensive Technology and Operations Management

Course general description:

This intensive 4-day training program provides a comprehensive exploration of sour gas sweetening technologies, covering critical aspects of design, operation, and management of gas processing systems. Participants will gain in-depth technical knowledge about removing acidic components (H_2S and CO_2) from natural gas streams, focusing on fundamental principles, advanced technologies, operational strategies, and critical maintenance techniques.

Audience:

This course is designed for:

1. Process engineers
2. Plant operators
3. Maintenance professionals
4. Production managers
5. Technical service engineers
6. Gas processing professionals
7. Project engineers
8. Consulting engineers

Course objectives:

By end of the course participants will gain:

1. Understand fundamental principles of sour gas treatment
2. Analyze different gas sweetening technologies
3. Design and evaluate gas sweetening processes
4. Implement effective operational control strategies
5. Develop comprehensive troubleshooting techniques
6. Apply safety and environmental considerations
7. Optimize unit performance and reliability

Course duration:

4 days

Course location:

Dubai

Course contents:

Day 1: Introduction to Sour Gas Treatment

1. Overview of sour gas chemistry, including acid gas properties and characteristics.
2. Sources of sour gas in the oil and gas industry and their environmental and safety implications.
3. Key mechanisms involved in acid gas removal and chemical reactions in gas sweetening.
4. Understanding thermodynamics, mass transfer principles, and solvent selection criteria.
5. Hands-on tutorial on chemical reaction calculations and a case study on sour gas characterization.

Day 2: Gas Sweetening Technologies and Design

1. Detailed review of amine-based and chemical absorption processes for gas sweetening.
2. Exploration of physical absorption methods and membrane separation technologies.
3. Introduction to emerging gas sweetening techniques and unit design considerations.
4. Equipment selection, process flow configurations, and mass/energy balance calculations.

5. Practical tutorial on design parameter calculations and a case study comparing gas sweetening technologies.

Day 3: Operational Control and Performance Optimization

1. Discussion of key operational parameters, control, and monitoring techniques.
2. Evaluation of instrumentation, control systems, and performance metrics for efficiency.
3. Solvent management, corrosion control, and fouling prevention strategies.
4. Optimizing equipment reliability and assessing economic performance.
5. Hands-on tutorial focused on performance optimization and a case study on improving operational efficiency.

Day 4: Troubleshooting, Maintenance, and Advanced Topics

1. Identifying common operational problems and diagnostic techniques for troubleshooting.
2. Root cause analysis and failure mode identification to enhance operational performance.
3. Preventive maintenance strategies and safety/environmental compliance considerations.
4. Review of regulatory requirements and advanced monitoring technologies.
5. Future trends in gas sweetening and the comprehensive final examination with course review

Methodology:

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

Course code: (TPRS010)