



N613: Natural Gas Processing - Dehydration, Refrigeration, and Fractionation

Tutor(s): Dale Kraus

3 Days

Competence Level:
Awareness



Classroom Course

Summary

This course is designed to familiarize technical professionals with the design and operation of several common gas plant processing blocks. Day one will be spent on dehydration systems used in typical field gathering and plant facilities, including a review of options available. Day two will focus on mechanical propane refrigeration systems typically used in Hydrocarbon Dew Point and NGL Recovery systems, including a review of design and performance enhancements. Day three will focus on tower operations and troubleshooting used in absorption and fractionation services, with optimization and key performance indicators discussed for each tower in each application.

Learning Outcomes

Participants will learn to:

1. Describe the design of a glycol dehydration unit.
2. Determine the water content of natural gas.
3. Review the operation and potential problems of a glycol dehydration unit.
4. Describe the types of gas processing pumps.
5. Briefly review desiccant dehydration systems.
6. Discuss the components of a refrigeration system.
7. Review the operating problems and possible solutions in a refrigeration system.
8. Describe the various liquids recovery options.
9. Review absorption and fractionation towers.
10. Review de-ethanizer and stabilization tower operation and typical operating problems.
11. Discuss product specification and pricing.

Duration and Training Method

This is a three-day classroom course with lectures, examples and exercises. Participants will earn 2.4 CEUs (Continuing Education Credits) or 24 PDHs (Professional Development Hours).

Who Should Attend

The course is intended for engineers, technologists and operators involved in the operation and optimization of gas processing facilities.

Prerequisites and Linking Courses

There are no prerequisites for this course.

Related courses on oil and gas field surface facilities include N611 (Introduction to Crude Oil Gathering and Processing), N612 (Introduction to Natural Gas Gathering and Processing) and N609 (API 650, 653 and 620 Storage Tanks).



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Course Content

Day One - Dehydration

1. Water Content of Natural Gas
2. Hydrate Formation, Prevention and Handling
3. Glycol Dehydrator Sizing
4. Optimization of a System
5. Operational Issues
6. Troubleshooting
7. Environmental Safety Considerations

Day Two - Refrigeration

1. Basic Operation and Design of Refrigeration Circuit
2. Capacity Control
3. Equipment Options
4. Power-Reducing Modifications
5. Troubleshooting H/C Dew Point Control Problems
6. Gas Expander - Propane Refrigerant Comparison

Day Three - Absorber and Fractionation Towers

1. Basic Design
2. Tower Internals
3. Capacity Control and Issues
4. Turn-Up and Turn-Down Problems
5. Amine Systems and Filtration
6. Stabilization vs. Oil Treating