



Debottlenecking Gas Processing Facilities - G-33

COURSE

About the Course

This course will cover how to establish a methodology for performing a debottlenecking study of a gas processing facility, as well as how to identify and evaluate debottlenecking options for specific equipment types and process systems.

The course will be primarily structured in a workshop format. The first part of the course (~1 day) will focus on defining the scope and establishing a logical methodology for performing a debottlenecking study. The remainder of the course (~4 days) will be spent determining the current capacities of an existing facility's major equipment and processing units, followed by identification and evaluation of the relevant debottlenecking options. A hypothetical 200 MMSCFD gas processing plant will be used as the basis for the study work. The plant is a mechanical refrigeration (propane) plant featuring inlet fluids reception facilities, condensate stabilization, inlet compression, amine gas sweetening, cooldown/NGL recovery including a de-ethanizer and propane refrigeration system, glycol injection and regeneration, and sales gas compression. Major process support/utility systems will be covered at a high level.

Debottlenecking cases of 230 MMSCFD and 260 MMSCFD will be evaluated. Three different scenarios will be considered for the expansion cases:

1. The expansion gas is *the same* as the original design "medium" feed composition
2. The expansion gas is *leaner* than the original design feed gas
3. The expansion gas is *richer* than the original design feed gas

The duration of the course will not allow for coverage of all possible gas processing configurations but "modules" for major process/equipment types that are not part of the case study plant, eg. TEG dehydration, will be provided as part of the course materials and covered during the week.

Much of the course content will be applicable to both onshore and offshore facilities, with the offshore facilities generally being somewhat less complicated. The general approach to debottlenecking and most of the equipment-specific module content will also be relevant to smaller field gas processing facilities as well as the gas-handling parts of an oil processing facility. An actual debottlenecking study could take several months to complete. This 5-day course will cover the main elements of a debottlenecking study without getting too deep into the details.

It is assumed that course participants have a solid understanding of how gas production and processing facilities work, including the commonly used processes and equipment involved.

Target Audience

Process/Facilities engineers with 5–15 years of experience, Facilities Engineering team leaders/supervisors, and Senior Facilities operational personnel.

You Will Learn

- How to establish a logical debottlenecking study methodology
- How to confirm that your existing facility is of a good design and in good condition, before looking at debottlenecking potential
- What the operational performance requirements are for the different major equipment types used in gas processing facilities, ie. what determines “capacity”
- Potential capacity vs efficiency tradeoffs
- How to quantify the capacity of the different major equipment types used in gas processing facilities. If there are several potential limits possible for a given type of equipment, which is controlling?
- What the typical debottlenecking options are for each equipment type, how to quantify their potential impact on capacity, and basic option selection considerations.
- Equipment “design” vs equipment “rating.” When and how to use which approach.
- How to differentiate between “hard” capacity constraints and “soft” capacity constraints for the different equipment types
- How to identify potential safety issues when pushing capacity limits
- What software tools are available to assist with the calculations involved

Course Content

- Review of the “Base Case” plant configuration and debottlenecking scenarios.
- Debottlenecking study methodology
- Establishing a baseline starting point
- Equipment/process module format:
 - Brief review of fundamentals
 - Main capacity limits and how to quantify them
 - Typical debottlenecking options and how to quantify them
 - Debottlenecking option selection considerations
 - Group time to work the selected case
- Modules covered:
 - Separation equipment
 - Reciprocating and centrifugal compressors
 - Amine sweetening units and their components
 - Columns, eg. fractionation and absorption
 - Heat exchangers (mostly shell & tube and air-cooled)
 - Glycol injection and regeneration systems
 - Centrifugal pumps
 - Fractionation facilities, separation requirements, condensers, reboilers
 - Plant piping
 - Glycol dehydration systems

- Relief and flare systems
- Main utility systems

Product Details

Categories: Midstream

Disciplines: Gas Processing

Levels: Intermediate

Product Type: Course

Formats Available: In-Classroom

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