

## OIL & GAS PROCESSING

### GUIDED WORK EXPERIENCES



*PetroSkills Guided Work Experiences (GWEs) enable technical professionals to deliver a tangible work product through specific deliverables and performance measures. GWEs have been developed by industry experts and deliver the on-the-job connection between knowledge and action.*

#### First Principles

- Complete material balance on operating facility
- Determine actual flowing conditions for a given stream in a gas plant
- Troubleshoot actual vs design operating data
- Determine phase diagram for inlet stream to a separator

#### Water / Hydrocarbon Phase Behavior

- Estimate water content for inlet gas stream under varied temperature
- Estimate Hydrate formation temperature (HFT) for gathering system.
- Select the most appropriate hydrate inhibitor
- Determine the optimum hydrate inhibitor injection rate for gathering system
- Determine the optimum hydrate inhibitor injection rate for propane refrigeration NGL extraction

#### Product Specification

- Determine Sales Gas and NGL specifications and nomination rates
- Optimize purity product operating compositions according to sales agreements.

#### Fluid Hydraulics

- Size facility piping for the inlet to a gas plant operating at ~1000 psia
- Size facility piping for an amine system
- Determine frictional losses to the inlet to a pump
- Determine current operating vapor velocities and check against erosional velocity guidelines
- Estimate the inlet stream momentum value on the inlet to a separator
- Estimate the line size for a high gas-oil ratio gathering system

#### Acid Gas Removal / Amine Testing

- Troubleshoot plant operations vs solvent vendors' guidelines
- Recommend chemicals, maintenance based on amine sample analysis

#### Separators

- Size a slug catcher
- Size a production separator, including nozzle sizing, and internals selection
- Troubleshoot a facility separator suffering from liquid carry over
- Analyze a vendor's bid for a separator (process specifications)
- Debottleneck a separator



*PetroSkills Guided Work Experiences (GWEs) enable technical professionals to deliver a tangible work product through specific deliverables and performance measures. GWEs have been developed by industry experts and deliver the on-the-job connection between knowledge and action.*

## Gas Dehydration - TEG

- Determine new minimum lean TEG required and circulation rate for changing inlet gas temperature and pressure
- Determine the amount of stripping gas required to achieve desired lean TEG concentration
- Troubleshoot a TEG contactor that is not making dry gas specification
- Review TEG sample analysis, make recommendations based on chemical addition and maintenance required
- Resolve TEG foaming issues
- Analyze a vendors bid for a TEG skid unit (process requirements only)

## Gas Dehydration - Mole Sieve

- Determine the life factor for your molecular sieve beds
- Estimate the remaining useful life of your molecular sieve bed
- Maximize the remaining useful life of your molecular sieve bed by utilizing stand-by time

## Heat Exchangers

- Determine UA of heat exchanger in the field, compare to clean and fouled UA.
- Determine if fouling is occurring over time in a heat exchanger
- Troubleshoot and optimize BAHEs on plant trip / start-up / shut-down
- Estimate minimum thermal performance of tube heat exchanger (plugged tubes)

## NGL Extraction / Refrigeration

- Evaluate propane refrigeration system for specified use
- Estimate the size of a new refrigeration unit based upon a required process cooling duty
- Troubleshoot a propane refrigeration system
- Troubleshoot a refrigeration NGL extraction plant - issues with MEG / hydrocarbon emulsions
- Troubleshoot a refrigeration NGL extraction plant - issues with hydrocarbon carry over from cold separator
- Analyze vendors bid for a turbo-expander skid (process conditions only - heat exchanger sizing validation)

## Fractionation

- Optimize performance and operation of a fractionation train
- Determine optimal reflux rate for current column operating conditions

## Oil / Water Separation

- Troubleshoot three-phase separator
- Analyze a vendors bid for a three-phase separator (process performance only)

## Oil Treating / Stabilization

- Estimate the required size for an electrostatic heater treater
- Analyze a vendors bid for a heater-treater (process conditions only)
- Determine the optimal number of stage separations for crude oil stabilization