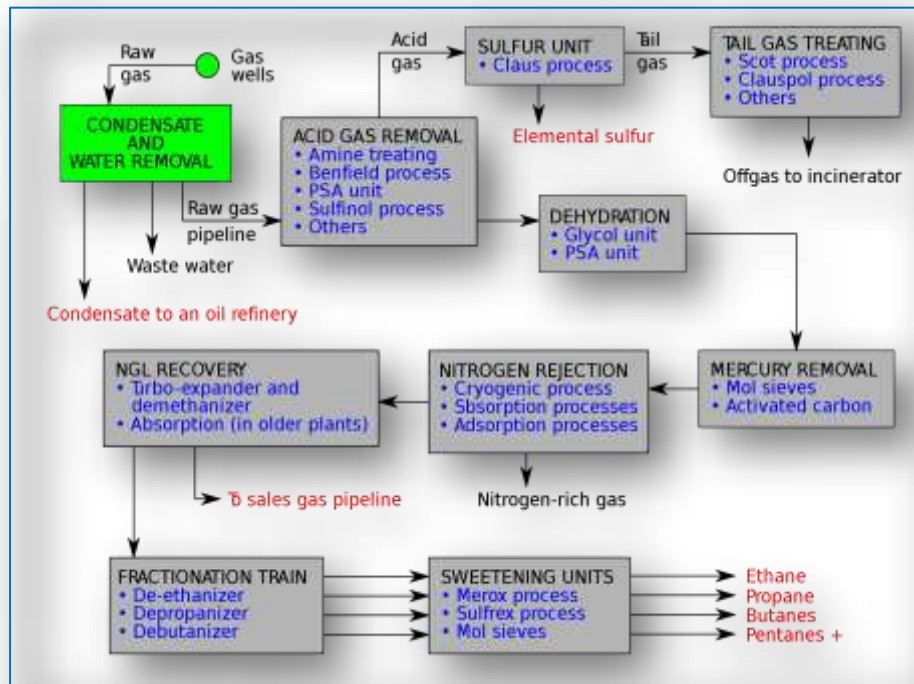




PCE133

Gas Condensate Network Layout & Operations Development

Course Introduction:

It typically takes several years for young university graduate engineers to master practical methods used in the process industry to solve problems. Gas condensate Layout/Design and Operations Development Practices is an intensive course for young process engineers to bridge the gap between university education and practical process design and troubleshooting in a short time of five days. After participating in the course, participants will know the most important layout/design practices and will be able to perform the necessary calculations to design and troubleshoot process units.

The course will be interactive involving all participants. The ICTD well experienced instructor illustrates the concepts with examples from his practical experience that he weaves into his lectures appropriately.

Course Objectives:

At the end of the course, participants will be able to perform the following:

- ✓ Vaporizer and steam drum heat balance
- ✓ Design pressure, temperature and flange class for all equipment in Stripper system
- ✓ Size all pipes and nozzles in Stripper feed circuit and list hydraulic cases
- ✓ Pressures at all points between a high and low pressure separator
- ✓ Size the Stripper feed flow meter, and permanent pressure drop
- ✓ Steam consumption in ejector
- ✓ Flashing liquid flow rate through a hole in a vessel
- ✓ Control valve size in the Stripper feed circuit
- ✓ Size and layout of recycle compressor suction drum
- ✓ Feed drum elevation from pump NPSH
- ✓ Feed pump motor size
- ✓ Compressor head, horsepower and outlet temperature
- ✓ Number of Stripper feed-bottoms exchangers
- ✓ Relief loads for the following cases; Fire case, Blocked liquid outlet, Inlet control valve fails open, Steam reboiler tube failure, Fractionator power failure and how the results can be quickly checked for relative accuracy

Who Should Attend?

This course is intended for all managers, section heads, team leaders, supervisors and engineers in the field of chemical, process, operation, production, maintenance, mechanical and layout/design. This course is also suitable for operators and technicians who wants to gain knowledge and involved in operation and design in processing unit.

Course Outline:

Day 1:

INTRODUCTION

SIMULATION

- Methods for performing mass, enthalpy and entropy balances
- Flash calculation principles and common simulation pitfalls
- vaporizer and steam drum heat balance refreshments and networking design conditions proven and consistent approach in determining design pressure and temperature, and typical mistakes made by inexperienced engineers case study
- Incinerator blockage and flooding workshop
- Design pressure, temperature and flange class for all equipment in stripper system hydraulics
- Structured approach for performing fluid flow calculations to determine all pipe, instrument and equipment sizes, including reasonable assumptions used during front end design workshop size all pipes and nozzles in stripper feed circuit and list hydraulic cases

Day 2:

PIPING - PRESSURE DROP METHODS FOR LIQUIDS, GASES AND TWO-PHASE FLOW, INCLUDING FLOW REGIMES CRITERIA AND METHODS USED FOR INSULATION, TRACING, HOT TAPS AND VALVING

- Determine pressures at all points between a high and low pressure separator. Flow meters orifice and nozzle sizing and installation, including liquid, gas, two phase flow, permanent pressure drop and flow rate correction methods case study
- Gasoline rundown line sizing
- Degassing system blockage
- Size the stripper feed flow meter, and determine permanent pressure drop
- Calculate steam consumption in ejector
- Determine flashing liquid flow rate through a hole in a vessel control valves
- Control valve sizing and installation, including gas, liquid and two phase flow, positional, actuators and failure modes
- Determine the control valve size in the stripper feed circuit

Day 3:

VESSELS

- Vessel types, sizing and rating, including level configuration, inlet piping and vessel support
- Determine size and layout of recycle compressor suction drum refreshments and networking towers
- Typical tower simulation, efficiency and flooding criteria, including derating factors

- Tray layout and clearances at feeds and draws, including reboiler types and configuration case study
- Vacuum bottom pumps losing suction pumps
- Typical pump piping, spillback options, seal and warm-up systems, stuffing box pressure and NPSH requirements pump drivers
- Pump and motor efficiency, current and horsepower calculations and motor sizing workshop
- Determine feed drum elevation from pump NPSH. Determine feed pump motor size

Day 4:

COMPRESSORS

- Compressor types, capacity control methods, anti-surge controls and head/power calculation methods workshop
- Determine compressor head, horsepower and outlet temperature exchangers
- TEMA types and guidelines, typical pressure drops and U values, effective and approach temperature, winterization and typical layouts case study
- Condensate system backup workshop
- Estimate number of stripper feed-bottoms exchangers heaters
- Simulation practices, including inlet piping, excess air, approach temperature and flue gas corrosion
- Heater components, startup and shutdown, dryout, decoking, sootblowing, and typical fuel gas/oil piping layout

Day 5:

RELIEF VALVES

- Relief valve types, ASME 1 and 8 criteria for determining set and accumulated pressure and API 520/521 methodology for determining relief cases, including double jeopardy and instrumentation credit workshop
- Determine relief loads for the following cases: fire case, blocked liquid outlet, inlet control valve fails open, steam reboiler tube failure, fractionator power failure case study
- Surging ejector system metallurgy
- Common materials of construction, ASTM designations, refinery corrosion mechanisms and design criteria, including CUI, temper embrittlement and high temperature H₂, H₂S and sulphur corrosion

Course Certificate:

International Center for Training & Development (ICTD) will award an internationally recognized certificate(s) for each delegate on completion of training.

Course Methodology:

A variety of methodologies will be used during the course that includes:

- (30%) Based on Case Studies
- (30%) Techniques
- (30%) Role Play
- (10%) Concepts
- Pre-test and Post-test
- Variety of Learning Methods
- Lectures
- Case Studies and Self Questionnaires
- Group Work
- Discussion
- Presentation

Course Fees:

To be advised as per course location. This rate includes participant's manual, and-Outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Course Timings:

Daily Course Timings:

08:00 - 08:20	Morning Coffee / Tea
08:20 - 10:00	First Session
10:00 - 10:20	Coffee / Tea / Snacks
10:20 - 12:20	Second Session
12:20 - 13:30	Lunch Break & Prayer Break
13:30 - 15:00	Last Session