



# Training

**in Multiphase Separation with gravity separators, scrubbers, and knock-out drums.**

## Course objective

To provide knowledge on the correct technology selection, design and operation of separators, and scrubbers.

## Who should attend?

Engineers, operators, and technicians working on production units.

## Upon completion of the course, participants will know the following:

- Typical upstream separation system design
- Separator, scrubber, and knock-out drums design and internals technology selection principle
- Familiarization with key project documentation for separator package
- Operation and control of separators
- Typical operational experiences and troubleshooting

## Deliverables

- Training documentation
- Training execution
- Workshop participation

## Location

Selected NOV training centers or client preference. Training can also be offered online.

## Duration

2-3 days

## Contact

[wellstreamprocessing@nov.com](mailto:wellstreamprocessing@nov.com)

## Training course includes

- Training by experienced technology personnel
- 2-3 days training for up to 10 trainees
- Hard and soft copies of training material in English

## Course content

### Welcome

- Safety moment
- Review of agenda
- Course objectives
- Introduction of participants and their expectations

### General design considerations

- Upstream process system line-ups
- Operating conditions and their effect on separator design and performance
- Fluid chemistry, surface forces, and emulsions
- Basic equations relevant for design
- Level control
- Separators subject to motion
- Piping and nozzles
- Design practices

### General design of vertical separators and scrubbers

- Type selection
- Conventional natural gas scrubber design

### General design of horizontal production separators

- Type selection
- Conventional horizontal 2-phase or 3-phase separator design
- Design of Flare Knock-out Drum

### Separator internals and their proper use

- Inlet devices
- Baffles
- Coalescers and agglomerators
- Mist elimination
- Vessel desanding
- Vortex breakers

### Project specific equipment design or study case

- Design basis
- Process flow diagram
- Functional and physical description of equipment
- P&ID
- Vessel general arrangement drawing
- Internals general arrangement drawing
- Installation
- Operation and control
- Troubleshooting

### Evaluations

- Q&A session
- Review – have the learning objectives been met
- Evaluation of course

