SIMULATION OF OIL & GAS FIELD TREATMENT PROCESSES

PRACTICE OF HYSYS AND ProII SIMULATION SOFTWARE

OBJECTIVES

To give a **comprehensive knowledge** of the common Oil & Gas field treatment processes, by a deeper understanding of the different elementary process operations, and to provide practical skills for the use of the HYSYS and ProII process simulation software.

On completion of the course, participants:

- acquire an excellent understanding of the different process operations, used in **most Oil & Gas processes:** flash separation, compression, expansion, heating or cooling, mixing, pumping, etc, and the parameters governing these elementary operations,
- are able to better analyze the most common Oil & Gas process schemes, **identify the key parameters, and know their influence on the process performances,**
- acquire a first experience in the creation of a new Process Flow Diagram (PFD), and the optimization of an existing process scheme,
- are able to simulate an industrial unit, at different operating stages, in order to **identify the designing case,**
- know how to get thermodynamic data from the database of the process simulation softwares: phase envelope, critical point parameters, hydrate formation risk area, different physical properties…

COURSE CONTENT

SOFTWARE PRESENTATION — 0.25 day

Software simulation principle
Presentation of the different pieces of equipment: pumps, compressors, heat exchangers, turbines, turbo-expanders, distillation columns, valves, gas and liquid pipes…
Choice of the thermodynamic model: PR, SRK…
Definition of pseudo-components, used to represent heavier components

SIMULATION OF A PROPANE CRYOGENIC LOOP — 0.75 day

Case of a simple loop
- Analysis of the loop operating conditions
- Influence of the different parameters: condensation and vaporization temperatures, propane loop rate…

Improvement of the loop performances by the addition of an intermediate expansion
- Optimization of the intermediate expansion pressure
- Comparison of results

Use of the propane enthalpy diagram to validate the software results
- Representation of the loop on propane enthalpy diagram, for each of the two cases
- Manual calculations of the process performances
- Comparison of the results to the outputs of the software

Influence of the propane purity and consequences of an air ingress

SIMULATION OF A CRUDE OIL FIELD TREATMENT UNIT — 1 day

Main field treatments for crude oils: stabilization, sweetening, desalting and dehydration, associated gas compression and treatment…
Study of an offshore crude oil field treatment unit, based on a Multiple Stage Separation (MSS) process scheme
Optimization of the operating parameters: pressures and temperatures of separators, suction and discharge condition of compressors, pumping needs for export by pipe…
Identification and adjustment of the controlling parameters, for each of the stabilized oil product specifications (rate, RVP, impurities content…) in order to meet the different quality requirements

SIMULATION OF A NATURAL GAS FIELD TREATMENT UNIT — 1 day

Main field treatments for natural gases: dehydration, sweetening, liquid extraction, compression and export…
Study of an offshore natural gas dehydration, liquids extraction and compression unit
Optimization of the operating parameters: first separator operating conditions, dehydration parameters, cooling temperature for a sufficient liquid extraction, compression needs upstream the export pipe…
Identification and adjustment of the controlling parameters, for each of the export gas specifications (rate, condensate content, water content…) in order to meet the different quality requirements
Analysis of hydrate formation risks: identification of the risky areas to protect by the injection of hydrate formation inhibitors

SIMULATION AND PROGRESSIVE BUILD-UP OF A PROCESS SCHEME FOR NATURAL GAS LIQUID EXTRACTION — 1 day

Progressive build-up of the Process Flow Diagram of a Natural Gas Liquid Extraction unit
Three processes are studied:
- External refrigeration loop
- Joule-Thomson expansion valve
- Turbo-Expander

For each case, optimization of the process performances, by suggesting, simulating and validating several modifications of the Process Flow Diagram
Comparison of the performances of the three optimized cases

SIMULATION OF NATURAL GAS LIQUID FRACTIONATION UNIT - DISTILLATION PROCESS — 1 day

Principle of separation by distillation process and main operating parameters
Simulation of a natural gas distillation unit
Characteristics of the main equipment and specific constraints

The course is based on several case studies, covering most of the Oil & Gas field processes.
It could be organized in French fo a single company (in-house training).

E-520

▲ Who should attend?

Personnel looking for a deeper understanding of the different transformations involved in the Oil & Gas field treatment processes. Technical/Process department or engineering staff, involved in the development of new field.

▲ Duration

5 days

▲ Dates & Location

May 25-29, 2009
Rueil-Malmaison (Paris)

▲ Registration

Fees: **€ 2,320**

Contact:
exp.rueil@ifptraining.com
Fax: (+33) 1 47 52 74 27

▲ Course Coordinator

Mohamed SKHIRI

Ref. **PROD / HYSYS**

ifp enspm FORMATION INDUSTRIE IFP ■ TRAINING