TECHNICAL
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School of Engineering

COURSE PROGRAMME

000106

Oil Production and Processing Facilities

The Oil Production and Processing Facilities training course will cover the oil processing and conditioning of a surface facilities system.



Learn from the Best in the Business!

Course overview

Foundation level

Why take this course

The Oil Production and Processing Facilities training course will cover the oil processing and conditioning of a surface facilities system. Participants will learn about the concept of the oil production and processing system. This course will cover the system all the way from the wellhead to the delivery of a specific oil product.

Delegates of the course will learn how select and evaluate processes and equipment used to meet fluid specifications and how to apply physical and thermodynamic property correlations. They will also learn about the principles of the design and evaluation of oil production and processing facilities, how to perform equipment sizing calculations for major production facility equipment, and evaluate processing configurations for different applications.

Who it is for and how it helps

Process/facilities engineers and senior operating personnel involved with the design and operation of oil and produced water processing facilities.

What you will learn

- Utilize fundamentals of Oil & Gas production techniques
- Explain operating principles and conditions of oil, water and gas treatment
- Understand the technology of main equipment and the difference of offshore production techniques
- Ascertain fundamentals of process control
- Draw and explain a typical safety system layout
- Explain main metering techniques, corrosion issues, its prevention and monitoring

Curriculum

Modules 01–05

01 Well effluents behavior

- Different types of well effluent.
- Main characterization parameters.
- Liquid/vapor equilibrium of pure substances and mixtures.
- Effluent behavior.
- Constituents that pose problems for storage, transport or commercialization.
- Main specifications to conform with and required treatments.

02 Reservoir & drive mechanism

- Reservoirs: types, exploration techniques.
- Drive mechanisms.
- Enhanced Oil Recovery (EOR): aim and principle of the main techniques.

03 Drilling, completion & well performance

- Drilling principle.
- Offshore drilling.
- Main completion equipment.
- Well performance.
- Needs for artificial lift: principle of artificial lift by pumping, gas lift

04 Well effluent transportation, flow-assurance & gas hydrates prevention

- Gathering network design and operation: main flow assurance issues; multiphase flow, flow patterns; hydrates formation prevention strategies, hydrates inhibition.

05 Crude oil processing

- Crude stabilization by Multi Stage Separation (MSS).
- Management of foam issues.
- Crude dehydration and desalting.
- Emulsion treatment.
- Crude sweetening (H2S removal).

Curriculum

Modules 05–10 · Module 05 — continued

- Case studies of oil treatment and associated gas compression process schemes.

06 Production & injection water treatment

- Quality requirements for production water. Environment related constraints.
- Main produced water treatments: API oil-water separators, plate separators, flotators, hydrocyclones
- Reasons for water injection.
- Quality requirements and necessary treatments: chlorination, filtration, oxygen removal, sulfate removal.
- Revision of process schemes for production and injection water treatment.

07 Gas processing & conditioning

- Gas dehydration: TEG units, solid desiccants (molecular sieves) units.
- Gas sweetening.
- Acid components (H2S and CO2) removal: amine units, molecular sieves, membranes.
- Natural Gas Liquids (NGL) extraction: use of cryogenic refrigeration, Joule-Thompson expansion, turbo-expander.

08 Liquefied natural gas

- Fundamentals of Liquefied Natural Gas (LNG) technology.

09 Case of offshore developments

- Offshore production structures: jacket, semi-submersible, spar, TLP, FPSO
- Storage and offloading vessels (FSO, FPSO, FPU).
- Deep offshore developments.
- Examples of subsea architecture.
- Flow assurance in (deep) offshore developments.
- Main preservation techniques and pigging solutions.

10 Rotating machinery

- Fundamentals of pumping circuits and gas compression.

Curriculum

Modules 10–14 · Module 10 — continued

- Operating principles, technology, selection criteria, performances and operating conditions of centrifugal & volumetric pumps and centrifugal & reciprocating compressors.
- Gas turbines.
- Turbo-expanders.

11 Thermal equipment

- Heat exchangers, air coolers, furnaces: types, operation, technology.

12 Fundamentals of corrosion

- Different types of corrosion, prevention and monitoring.

13 Electrical systems - instrumentation & process control - safety systems

- Electrical power generation.
- Electrical power distribution network and equipment.
- Field instrumentation; controllers; control loop structures.
- Distributed Control System (DCS).
- Safety Instrumented Systems (SIS): ESD, HIPS, Fire & Gas System.

14 Metering & allocation

- Importance of metering and production allocation.
- Production accounting & material balance.
- Introduction to material balances: liquid and gas balances.
- Transactional metering of liquids and gas.
- Multi-phase metering: advantage, principle and fields of application.

Programme instructor



Михаил Арабов

Инструктор по подготовке и переработке нефти и газа Михаил Арабов помогает нефтяникам и газопереработчикам улучшить производственный процесс и достичь долгосрочных преимуществ для своих компаний. К.х.н., доцент Астраханского государственного технического университета, Михаил обладает более чем 40-летним опытом работы в различных сферах нефтяной и газовой промышленности.

Михаил является автором пяти изобретений и более 100 рационализаторских предложений, которые были успешно внедрены на газоперерабатывающем заводе. Он также опубликовал более 100 научных статей в центральных и местных изданиях, направленных на улучшение работоспособности оборудования, экономию ресурсов и создание экологически безопасных технологий.

Михаил Арабов - высококвалифицированный специалист в области добычи, переработки нефти и газа. Он автор учебного пособия «Техника и технология добычи и подготовки нефти, газа и утилизации пластовых сточных вод» и множества научных трудов.

Михаил получил высшее образование и степень кандидата химических наук. Он окончил Томский политехнический институт по специальности «Инженер-технолог редких и рассеянных элементов», а также Астраханский Государственный университет, где получил дополнительное образование в области механики бурения и нефтепромыслового оборудования.

Михаил имеет богатый опыт работы в нефтегазовой отрасли, включая должности главного инженера по проектированию и строительству заводов по сжиженному газу, заведующего кафедрой «Машины и оборудование нефтяных и газовых месторождений», а также руководителя проекта по строительству морской буровой ледостойкой платформы для месторождения на каспийском море. Также в свое время работал начальником теплоцеха и установок по стабилизации углеводородного конденсата, нефти, утилизации пластовых сточных вод.

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Participation and contacts

Joining the programme

Contact the Academy and quote course code 000106 to confirm dates, delivery format, prices and enrolment terms.

Training for your team

Tell us your business goals, the roles and number of participants, and your preferred dates and location. This will help us discuss the right training option.

Preparing for the programme

The published programme does not specify any prerequisites. Contact us before enrolling to confirm how to prepare.

Discuss your training needs

mail@tecedu.org
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