TECHNICAL EDUCATION ACADEMY

School of Engineering

COURSE PROGRAMME

000101

RPCH002 - Natural Gas

This course provides a comprehensive review of the techniques involved in natural gas production, processing and transport, complemented with an overview of natural gas valorization channels.



Learn from the Best in the Business!

Course overview

Foundation level

Why take this course

This course provides a comprehensive review of the techniques involved in natural gas production, processing and transport, complemented with an overview of natural gas valorization channels.

Who it is for and how it helps

Professionals from all sectors, involved or interested in the natural gas industry.

What you will learn

- Explain fundamentals of natural gas composition, characteristics, production and field processing
- Understand technical issues and specific constraints of natural gas transport and storage
- Review the various end-user markets available for valorizing natural gas
- Grasp key natural gas chain economic issues

Curriculum

Modules 01–04

01 Natural gas: types & production techniques

- Types and characteristics of natural gas fields. Production techniques.
- Different types of natural gases (condensate, wet or dry gas) and characterization parameters.
- Constitution of natural gas well effluent, properties and specific hazards.
- Case of associated gases: recovery techniques, characteristics, composition, etc.

02 End uses of natural gas - Main quality requirements

- End uses of natural gases: fuel (domestic and industrial uses), conversion into other energy types (electricity production and cogeneration), automotive fuel (Natural Gas for Vehicles - NGV and conversion into liquid automotive fuels GTL), chemical valorization, etc.
- Quality requirements for commercial natural gases and associated products (ethane, LPG, condensates) - Examples of quality standards.

03 Natural gas processing

- Gas dehydration (drying) and Hydrate formation inhibition:
- System behavior. Moisture content of a saturated gas.
- Applications: moisture content of different gases having various compositions.
- Hydrate formation inhibition by injection of inhibitors: MeOH, MEG, DEG, LDHI, etc.
- Gas dehydration: TEG units, Molecular Sieves, etc.
- Application: summary design of TEG unit.

04 Gas sweetening: removal of acid components (H2S and/or CO2)

- Different techniques applicable for gas sweetening:
- Chemical solvent processes. Amine units (MEA, DEA, DGA, MDEA, etc.).
- Physical solvent processes.
- Hybrid (physico-chemical) solvent processes.
- Overview of other techniques.
- Conversion of H2S: sulfur production (CLAUS process) and tail gas processing.
- Application: summary design of an amine unit.

Curriculum

Modules 05–09

05 Natural Gas Liquids (NGL) extraction (removal of heavy components)

- External refrigeration loop.
- Joule-Thomson expansion.
- Turbo-Expander.
- Application: calculation of cryogenic loop used for NGL extraction.

06 Examples of gas field development schemes:

- Gas fields development options: onshore or offshore processing, single-phase or multiphase export pipelines, “Wet” or “Dry” development.
- Other treatments: mercury removal, conversion or adsorption of mercaptans (RSH), etc.

07 Transport of natural gas in liquid phase - LNG option

- Liquefaction processes: principle, typical operating conditions, technology.
- LNG tanks: Single or Double or Full Containment (self-standing, membrane). Hazards.
- LNG transport: LNG carriers (MOSS spheres, Membrane, ...), export and receiving terminals.
- LNG regasification at the receiving terminals, options for refrigeration duty recovery.

08 Transport & storage of natural gas in gas phase

- Gas pipes: technology, capacities, equipment, recompression units, operating conditions, etc.
- Underground storage (old reservoirs, aquifers, salt domes, etc.). Required treatments at outlet.

09 Natural gas economics

- Resources, production and markets.
- Natural gas marketing: competition of other energy sources and consequences on gas contracts (prices and duration), cost of transport and its impact on the structure of the gas chain.
- Future of the natural gas.

Participation and contacts

Joining the programme

Contact the Academy and quote course code 000101 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
www.tecedu.academy

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