TECHNICAL
EDUCATION
ACADEMY

School of Engineering

COURSE PROGRAMME

000100

RPCH003 - Liquefied Natural Gas Fundamentals

This course contrasts the technical and commercial differences between LNG and natural gas to point out benefits and constraints that arise from the LNG option.



Learn from the Best in the Business!

Course overview

Foundation level

Why take this course

This course contrasts the technical and commercial differences between LNG and natural gas to point out benefits and constraints that arise from the LNG option. It will examine the technical process of producing LNG, plant design considerations, global comparisons along with the design of regasification terminals.

A description is given of the elements in the 'gas chain' which apply to LNG and of drivers that would lead to optimisation of design and commercial operation, and the range and role of relevant parties to a successful LNG project. LNG safety is covered in detail, along with ways and means by which a new entrant to a proposed LNG project may ensure an investment that meets expectations.

An introduction to terminology and practical 'rules of thumb' should further enhance the participant's ability to immediately contribute to a successful gas project – and to ask the right questions to test and improve the viability of a proposed project.

New initiatives in floating LNG technology, both liquefaction and regasification, will be examined. Floating regasification projects are contrasted with land-based projects. Actual case histories will be used frequently to demonstrate learning points.

Who it is for and how it helps

Professionals involved or interested in the LNG industry: technical and managerial staff in the LNG industry, equipment providers, personnel from engineering companies, etc.

What you will learn

- Understand the technical procedures for turning natural gas into LNG, its regasification and safety considerations
- Review LNG plant and terminal design, storage and shipping consideration
- Identify recent developments in FLNG technology
- Discover the unique characteristics of LNG that broaden yet constrain the commercial and technical links in the 'gas chain'
- Generate various options for LNG market development proposals
- Discover risk and risk mitigation strategies to aid decision making
- Analyse LNG sales agreements and tactics to more effectively negotiate contract terms
- Discover perspectives of the investor, the operator, the customer and government towards LNG projects
- Recognise political and diplomatic implications of international trade in LNG, including recent trends

Curriculum

Modules 01–05

01 Introduction and overview

- Insight into the fundamental principles governing the successful development and operation of an LNG project.

02 Technical characteristics of natural gas and LNG

- An introduction to the unique physical characteristics of NG and LNG is presented so that technical and commercial opportunities and constraints may be understood and contrasted with other liquid and gaseous fuels

03 Gas liquefaction

- Capital costs and economies of scale, cost trends and benchmarks
- Technology and typical processes, lead and construction times
- Storage requirements
- Typical EPC contracts, their operation and examples

04 LNG shipping

- Capital costs and operating conditions of LNG carriers, benchmarks, typical designs, lead and construction times
- Vessel size and constraints
- FoB vs. DeS
- Fleet management issues
- Discussion of degree of technical and commercial flexibility in LNG delivery schedules and associated contractual terms
- Examples of delivery arrangements are examined from buyer and seller perspectives

05 LNG terminals and end-users

- Capital costs and benchmarks, typical designs, lead and construction times
- Storage requirements
- Upset conditions and responses
- Capacity/storage optimisation
- Special issues involving power generation

Curriculum

Modules 06–09

06 LNG safety

- The cryogenic temperature of LNG and the generation of large quantities of gas on vaporisation require significant and different safety requirements for the safe handling, storage and use of LNG.
- LNG and other fuels.

07 Market identification and development

- The three levels of market identification, costs, compatibility of gases, and conversion to reticulated natural gas
- History of LNG market development and their pricing mechanisms
- Outline of LNG sales and purchase agreements; related contract terms and conditions and their evolution

08 International competition for LNG markets

- Current intense competition for markets placed in a historical context
- Analysing the effect on pricing formulae and contract terms
- The short-term trade – 'the spot market' – regional pricing conventions and their robustness
- Examining signs of price convergence
- Analysing market share data and relative positions of LNG participants

09 LNG business development

- Understanding key factors that generate a successful LNG market
- Examples of the dynamic balance between supply and demand with reference to substitute and 'swing' fuels
- Project 'realities' – including reputation issues and sponsors' track record
- Project governance
- Drivers behind project participation and role of the state
- Examples of successful and sub-optimal participation by small and larger new-entrants
- Necessity for independent advice, and ways and means to keep up to date

Curriculum

Modules 10–11

10 An integrated LNG project – 'rules of thumb'

- Typical default parameters frequently encountered in a successful LNG project
- International convergence in capital costs allows estimation of netbacks or margins at each element of the gas chain – local variations may call for explanation

11 LNG outlook and future trends

- The century of gas – the basis for expected future market expansions and extensions
- Discussion of limiting factors and time constraints
- Suggested pointers for early warning of likely and sustained market changes
- Potential forces which impact on commoditisation and/or price convergence
- Integration in US and Europe
- Examining the effects of potential LNG trade to west coast US

Joining the programme

Contact the Academy and quote course code 000100 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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