

Natural Gas Transport by Pipeline

Technology - Operation - Economics

2 days
Overview

NGTRANS-EN-P

LEVEL

Knowledge

PURPOSE

This course provides an overview of the technical and economic issues of natural gas transport by pipeline.

LEARNING OBJECTIVES

Upon completion of the course, participants will be able to:
gain an overview of the world map of natural gas pipeline networks,
review marketed gas pipeline design: route, sizing, material, compression stations positioning and design, etc.,
assess pipe laying organization, management, constraints, planning, and techniques,
understand gas transportation network maintenance and daily operations within the framework of regulations,
grasp fundamental issues of natural gas transport economics and third-party access.

WAYS AND MEANS

Highly interactive training by industry-specialist lecturers.
Numerous applications and illustrations.

LEARNING ASSESSMENT

Assessment by test at the end of the course.

PREREQUISITES

In order to be able to follow this training, trainees are asked to fulfill at least one of the criteria below:
either a Bac or equivalent level,
or to have a proven professional experience in pipeline transportation of LNG of at least 6 months.

Agenda

INTRODUCTION TO NATURAL GAS

0.25 d

From reservoir to end user.
Chemical composition and properties of natural gas. Comparison to other combustible gases.
World reserves.
Panorama of offer, demand and movements.

TRANSPORT NETWORK

0.25 d

Overview of worldwide networks.
Perspectives of the development of the European network.
Interaction with other blocks of the natural gas chain: storage, LNG terminals, compression stations,
network interconnections, delivery to the client.
Economical and technical comparison between transport by pipeline and LNG carriers.

DESIGN & CONSTRUCTION OF A GAS PIPE

0.5 d

Design standards: pressure, length, volume, diameter.

Fundamentals of metallurgy welding techniques and coating materials.

Pipe laying:

Different steps of pipe laying operations.

Cost/duration of pipe laying and compression station construction.

COMPRESSION

0.25 d

Characteristics of compressors: compression ratio, run-time frequency, environment-related issues (exhaust gases, noise, etc.), power types.

Types of compressor units: driver type (engine, electrical motor, gas turbine, etc.), reciprocating or centrifugal compressor.

Comparison between gas turbine and motor drivers, fuel gas and electricity power.

OPERATION OF A NETWORK

0.5 d

Maintenance, monitoring and technical management, risk prevention, safety regulations (law of August 4, 2006), cathodic protection, equipment maintenance, monitoring and controls, metering.

Network operation management: planning, execution, allocations and accounts.

ECONOMICAL ASPECTS OF GAS TRANSPORT BY PIPELINE

0.25 d

Investment costs (CAPEX).

Lifetime of a gas pipe.

Operation costs (OPEX).

Pricing for access of third parties to the gas transport network: analysis of the price breakdown in France.

Simulations of cost price per kWh delivered, for some typical cases.