Understanding LNG Terminals and Terminal Operations

Understanding this link in the LNG chain in the context of the global LNG industry is an essential part of LNG training. Participants learn about LNG terminal planning, construction, operations, storage, and shipping from LNG experts with decades of experience.

Instruction methods include presentations with interactive discussions and group exercises, as well as assignments during the course and a final exam on the last day of the course.

Course Topics

**LNG Basics**
Properties; thermodynamics; flashing; boil-off; overview of export and import plants; LNG trade movements; LNG value chain; pricing.

**Liquefaction**
Historical timeline; block flow diagram, description of major units; licensed technologies, equipment and power.

**Receiving Terminals**
Basic design issues; historical timeline; terminal economics; interchangeability

**Offshore LNG**
Definitions of FPSO and FSRU; full floating LNG chain; drivers for moving LNG offshore; 3-D videos of FPSO and FSRU concepts; offshore LNG transfer.

**Transforming a Terminal Concept into a Plan**
Defining the plant’s purpose; basic plant components; site selection; plant size optimization; containment types; recondensing and storage tanks; pressure control during cargo transfer.

**How a Plant Operates**
Understanding and riding the pump curve; controlling plant sendout; boil-off generation (heat leak, viscous dissipation, pump work); recondenser 201—why it works and how it works; in-line compressors.
Designing an LNG Terminal: 40 Issues to Consider

Hire experts; write documentation; develop contingency plans; design in sufficient valves; determine commissioning methods; plan for corrosion coupons; perform a valve tightness test; plan on zero sendout; 32 additional considerations.

Plant Commissioning

Importance of appropriate design; purge, gas in, and cooldown; sequence of events and critical path planning; initial operation; contingency planning; modes of operation; plant concerns: dead legs, short stem valves, shock cooling; taking equipment out of service; tuning equipment.

Plant Safety

Scenarios; hazardous situations; hazard detection; emergency response; emergency prevention philosophy; procedures (LOTO, MOC, permits, and others).

Measure Once—Measure Right

Volumetric measurement; calorific measurement; energy measurement; factors causing errors; cost of errors; trust and verify (industry practices); principle of mass balancing.

Plant Contingency Planning

Cold spot on tank; critical lines out of service; tsunamis and earthquakes; loss of utilities; gas supply; electric supply; outlet pipeline; loss of key personnel; import of high-nitrogen LNG.

Consequences of Varied LNG Composition Inventories

Boil-off gas management; density management; switching from BOG to vaporizer for fuel; customer consequences; stabilization for interchangeability.

Understanding Fill- and Nitrogen-Induced Rollover

Fill-induced rollover; nitrogen-induced rollover; warnings of stratification; bottom layer reaching bubble point.

It’s Really Not All About LNG—Flare, Utility, ESD Systems, Etc.

Flare systems; nitrogen systems; water and sewer systems; electrical supply; export piping and metering system; system capabilities; community and government relations.

HAZOP Revisited

Risk management; likelihood and severity matrix.

To Truck or Not to Truck

Density temperature relationship; associated risk; portable pipelines; deferment of capital expenditures; system emergency response.

Shipping

LNG tanker design, LNG shipping costs, tanker and terminal safety, LNG Shipyards, the LNG tanker fleet, LNG shipping demand, cargo containment systems, propulsion, shipboard line cool down, ship and terminal interface including, vessel and terminal security, stability, ship to shore communication and custody transfer.

Review Exam

Final exam for the course.

Get more details at gastechnology.org/training