Liquefied Natural Gas (LNG) Value Chain: Liquefaction, Storage, Shipping and Regasification

1 – 5 November 2027
London - Central London four-star



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Introduction:

Staff moving into liquefied natural gas LNG projects often understand only their own link of the chain, so feed gas specifications, boil-off losses, cargo scheduling and regasification send-out are planned in isolation and the cryogenic hazards are underestimated. This Core Concept course follows LNG from feed gas pre-treatment and liquefaction through full containment storage, carrier loading and shipping to regasification terminals and FSRUs, then covers LNG safety, contract and pricing basics and small-scale LNG. Participants walk through each facility type and produce an LNG Value Chain Map and Hazard Register for their own role.

Course Objectives:

- Explain LNG composition, cryogenic properties, volume reduction and heating value and relate them to feed gas specifications
- Describe the pre-treatment units that remove acid gas, water, mercury and heavy hydrocarbons ahead of the cold section
- Compare the published liquefaction processes and trace refrigerant cycles and main cryogenic heat exchanger duty on a process flow diagram
- Track boil-off gas generation in storage tanks, jetty lines and carrier cargo tanks and select handling routes such as compression, fuel use and reliquefaction
- Identify rapid phase transition, cryogenic embrittlement and vapour cloud hazards and match them to the safeguards found on LNG terminals and ships
- Interpret the main terms of LNG sale and purchase agreements and price indexation and compile an LNG Value Chain Map and Hazard Register

Target Audience:

- Process and mechanical engineers joining liquefaction, storage or regasification projects
- Operations and maintenance staff responsible for LNG tank farms, jetties and vaporiser trains
- Commercial and shipping staff who schedule cargoes, nominate volumes and administer LNG contracts
- Planning and supply chain staff who forecast send-out and coordinate carriers with terminals
- HSE advisers responsible for cryogenic hazard assessment at gas terminals
- Project and asset integrity staff moving from pipeline gas or oil into LNG assets

Course Outline:

Day 1: LNG Properties and the Value Chain from Gas Field to Market

- LNG Value Chain Block Diagram: Feed Gas, Liquefaction, Shipping and Regasification
- Methane-Rich Composition, Minus 162 Degree Boiling Point and the 1/600 Volume Ratio
- LNG Density, Higher Heating Value and Wobbe Index in Cargo Energy Accounting
- Flammable Range of 5 to 15 Percent and Why Liquid LNG Does Not Ignite
- Participant Role Baseline: Mapping Each Delegate's Link in the LNG Chain

Day 2: Feed Gas Pre-Treatment and Liquefaction Process Technology

- Acid Gas Removal Unit with Amine Solvent for CO2 and H2S Specification
- Molecular Sieve Dehydration and Mercury Guard Bed Removal
- Heavy Hydrocarbon and NGL Removal Ahead of the Scrub Column
- AP-C3MR and AP-X Propane Pre-Cooled Mixed Refrigerant Trains
- Cascade, Shell DMR, Linde MFC and Single Mixed Refrigerant Process Comparison

Day 3: LNG Storage, Boil-Off Gas and Carrier Loading

- Full Containment Tank Design: Prestressed Concrete Outer Wall and Nickel Steel Inner Tank
- Tank Rollover, Stratification Monitoring and Auto-Refrigeration Behaviour
- Boil-Off Gas Compressors, Recondensers and Fuel Gas Routing
- Jetty Loading Arms, Vapour Return Line and Ship-Shore Link Procedure
- Moss Spherical, GTT Membrane Mark III and NO96 and SPB Cargo Containment Systems

Day 4: Regasification, FSRUs and LNG Hazard Safeguards

- Open Rack, Submerged Combustion and Intermediate Fluid Vaporiser Selection
- FSRU Configuration: Onboard Regasification Skid, Risers and Send-Out Pipeline
- Rapid Phase Transition on LNG Spills to Water and Cryogenic Embrittlement of Carbon Steel
- Vapour Cloud Dispersion, Pool Fire Radiation and Spill Impoundment Sizing
- Emergency Shutdown, Gas and Cold Spill Detection and Cryogenic PPE Requirements

Day 5: LNG Commercial Basics, Small-Scale LNG and the Value Chain Walkthrough

- LNG Sale and Purchase Agreement Terms: Take-or-Pay, FOB and DES Delivery
- Oil-Indexed Versus Hub-Indexed Pricing with Henry Hub Linked Cargo Examples
- Small-Scale LNG: Peak-Shaving Plants, Truck Loading and LNG as Marine and Road Fuel
- Walkthrough Exercise: Liquefaction Train, Tank Farm, Jetty and FSRU Layouts
- LNG Value Chain Map and Hazard Register Drafting and Peer Review

Skills You Will Gain:

- LNG Property Interpretation
- Gas Pre-Treatment Specification
- Liquefaction Process Recognition
- Boil-Off Gas Management
- Cargo Containment Awareness
- Regasification System Selection
- Cryogenic Hazard Identification
- LNG Contract Literacy

Why Attend This Course:

- Leave with an LNG Value Chain Map and Hazard Register built from walkthroughs of liquefaction, storage, jetty and FSRU layouts
- Talk with process, shipping and commercial colleagues using the same terms for boil-off, send-out, cargo energy and delivery point
- Spot rapid phase transition, cold spill and vapour cloud scenarios before they appear in a design review or a site visit
- Compare LNG practice with engineers, operators and traders from producing, shipping and importing organisations

Conclusion:

Working safely and profitably in LNG depends on seeing how each link of the chain affects the next: feed gas quality sets liquefaction duty, tank heat leak sets boil-off, cargo containment sets shipping losses and vaporiser choice sets send-out. The course moves from LNG properties and the value chain, through pre-treatment and liquefaction technology, storage, boil-off and loading, to regasification, FSRUs and hazard safeguards. The final day adds contract, pricing and small-scale basics and produces an LNG Value Chain Map and Hazard Register for each participant.