About the Course

This is the LNG-industry version of our popular G-4 course, with expanded coverage of refrigeration and LNG technologies. The course includes in-depth information on basic natural gas conditioning and processing. This is mainly the core G-4 Campbell Gas Course curriculum in an LNG context with the expanded refrigeration coverage. The course covers relevant details of both the mixed refrigerant (APCI) and cascade (ConocoPhillips) processes in LNG liquefaction. Reference is made to other liquefaction processes including Mixed Fluid Cascade Process, Dual Mixed Refrigerant Process, and Nitrogen (single or dual) Cycles being developed for FLNG projects. This is followed by higher level coverage of the LNG value chain consisting of a gas liquefaction section; LNG run-down to LNG storage; loading berth for LNG export; LNG shipping; and LNG receiving and regasification terminals. Versions of this course have been taught in many of the world's base-load and peak-shaving LNG plants, such as Australia, Indonesia, Malaysia, Norway, Qatar, UK, and West Indies.

See detailed schedule for the Virtual sessions here

"Liked structured approach to looking at main components of gas conditioning." - Project Engineer - Australia

"Very engaging facilitator. He knew the topic very well!" - Graduate Engineer, Australia

Target Audience

Personnel involved with natural gas processing and LNG production, as well as anyone interested in a solid technical understanding of the principles of an LNG plant.

You Will Learn

- The basics of LNG gas conditioning and processing
- Selection and evaluation processes used to dehydrate natural gas, remove heavy components and other contaminants, and extract NGLs for LNG plants
- Physical/thermodynamic property correlations and principles, including heating values, etc. as applied to gas processing facilities and LNG plants
- Fundamentals of propane, propane-precooled, mixed refrigerants, and cascade systems used in LNG plants
- Key points in other LNG liquefaction technologies
- How to perform and review equipment sizing for major process equipment
- Solutions to operating problems and control issues in LNG and gas processing facilities

Course Content

- Basic gas technology principles
- Terminology and nomenclature
- Physical properties of hydrocarbons
- Qualitative phase behavior
- Vapor-liquid equilibrium
- Water-hydrocarbon system behavior, hydrates, etc.
- Thermodynamics of LNG processes
- Separation equipment
- Gas treatment, CO2, and H2S removal
- Dehydration of natural gas (TEG and Molecular Sieve)
- Heat transfer and exchangers
- Pumps and compressors
- Refrigeration systems
- LNG liquefaction technologies
- Fractionation
- Other facilities topics relevant to LNG
- Course summary and overview

VIRTUAL SCHEDULE

Week 1	Virtual Instructor-led Class	Virtual Class Hours (Approx.)	Online Learning Modules (Approximate hours)
Day 1	Orientation, Introduction, Gas Processing Overview, LNG Value Chain	2.5	Gas Processing Overview 1.75 hours Gas Processing Fundamentals 2.25 hours Hydrocarbon Phase Behavior 3.40 hours Water-Hydrocarbon Phase Behavior 2.00 hours + 0.25 hours optional content
Day 2	Process Engineering Fundamentals Workshop Standard Conversions,	4.0	
Day 3	Process Engineering Fundamentals Workshop	4.0	

	Fluid Flow 2.75 hours + 0.75 hours optional content		Fluid Flow 2.75 hours + 0.75 hours optional content
Day 4	Hydrate Inhibition Workshop	4.0	Basic Thermodynamics and Applications of Energy Balances 1.75 hours
Day 5	Multiphase Flow Workshop	4.0	
Week 1 Total	**Virtual Classes: 22.5 hrs**		**Online Learning: 14 hrs + 1 hrs optional**

Week 2	Virtual Instructor-led Class	Virtual Class Hours (Approx.)	Online Learning Modules* (Approximate hours)
Day 1	Thermodynamic Workshop	4.0	Heat Transfer Equipment 2.25 hours Sepa5ration Equipment 1.5 hours Rotating Equipment: Pumps and Compressors 4.50 hours Mechanical Refrigeration 2.00 hours NGL Extraction 1.50 hours Fractionation 1.80
Day 2	Heat Transfer Equipment Workshop	4.0	
Day 3	Separation Workshop	4.0	
Day 4	Rotating Equipment (Pumps and Compressors) Workshop	4.0	
Day 5	Mechanical Refrigeration Workshop Additional Refrigeration Processes	4.0	
Week 2 Total	**Virtual Classes: 20 hrs**		**Online Learning: 14.50 hrs**

Week 3	Virtual Instructor-led Class	Virtual Class	Online Learning Modules
Day 1	NGL Extraction and Fractionation Workshop	4.0	
Day 2	Dehydration and Gas Treating/Sulphur Recovery Workshop	4.0	TEG Dehydration 1.50 hours + 0.50 hours optional content
Day 3	Storage and Loading LNG Shipping Storage and Loading	4.0	Molecular Sieve Dehydration 1.50 hours
Day 4	Import Terminals LNG Safety LNG Shipping	4.0	Acid Gas Removal 2.75
Day 5	Group Exercise Course Close Out	4.0	
Week 3 Total	**Virtual Classes: 20 hrs**		**Online Learning: 6 hrs + .5 hr optional**