

Anatomy of LNG Shipping & Operations

21 - 25 June 2020
Madingley Hall • Cambridge

Organised by



Cambridge Academy of Transport

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Cambridge Academy of Transport

Registration Form

ANATOMY OF LNG SHIPPING & OPERATIONS

21-25 JUNE 2020

To register, please complete this form and send it by fax or email to Tulika Singh at the number given below.

PARTICIPANT 1: Title _____	First name(s) _____
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Enclosed is a cheque Please invoice my Company I wish to pay by Credit Card (details below)

Seminar Fees: The fee of **£4,290** includes UK Value Added Tax, tuition, accommodation, all meals, documentation and a full social programme. Payment can be made by cheque, bankers draft or inter-bank transfer. Cheques should be made payable to Cambridge Academy of Transport in Sterling drawn on a Bank in the United Kingdom. Our Bank details are:

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Course Programme

Anatomy of LNG Shipping & Operations
21 - 25 June 2020
Madingley Hall • Cambridge

Course Leader

**Paul Veldhuizen • Independent Consultant and former Head of Global LNG Operations •
Shell Gas & Power and Fleet Operations, • Shell Shipping & Maritime (STASCO Ltd)**

INTRODUCTION

**Sunday
21 June**

Welcome

Welcome, introductions, expectations, housekeeping

**Session 1
1445-1500**

Course Overview

- Introductions
- Expectations
- Course Overview

**Session 2
1500-1530**

MODULE I – LNG: THE BASIS AND THE BASICS

Physical Properties and Origins of Commercial LNG Trade

- Physical Properties of Natural Gas and LNG
- Liquefaction and Cryogenic Engineering
- Origins of commercial LNG and seaborne transport
- Early LNG projects and their evolution Coal, Oil, Gas and Renewables – overview

**Session 3
1530-1800**

Drinks Reception & Dinner

1800

MODULE II - CARRIER DESIGN & CHARACTERISTICS

**Monday
22 June**

Reflection, Programme for the day and Housekeeping

0830-0845

Containment Systems - Origins

- The Pioneers of LNG Shipping
- Membrane Systems

**Session 4a
0845-0945**

**Session 4b
1000-1115****Containment Systems – Evolution and Future Trends**

- Moss Containment System
- Different Membrane Containment systems
- Prismatic Containment
- Who Builds What
- Future Trends

MODULE III - PROPULSION SYSTEMS**Session 5a
1115-1245****Propulsion Systems – The Origins and Current State**

- Early Propulsion Systems – Steam Turbines
- Hybrid Steam and Gas Turbine
- Dual and Tri-fuel Diesel Electric
- Origins of on-board (full) cargo reliquefaction

**Session 5b
1400-1515****Propulsion Systems – Future Trends**

- Slow Speed Diesel propulsion with Gas Injection (MEGI)
- Further evolution of Main Engine Gas Injection: XDF
- The Otto vs Diesel Cycle and updated Win XDF Range
- Market trend in propulsion systems
- XDF Technology: A Game Changer?
- Future Trends

MODULE IV - TECHNOLOGY**Session 6
1530-1700****Vessel Efficiency, LNG as a Fuel and Alternatives**

- Decarbonising Shipping by 2050 – Future Pathways
- Energy Efficiency Design Index (EEDI) and Management Plan (SEEMP)
- LNG as Fuel: Enablers, Economics and Concerns
- Alternative Fuels: LPG, (Bio) Gas/Methanol, Hydrogen, Electric
- Slow Steaming and Just-in-Time Arrival (intro)

**Tuesday
23 June****Reflection, Programme for the day and Housekeeping****0830-0845****MODULE V – TERMINAL DESIGN AND OPERATIONS****Session 7
0845-1000****Design Features of Load and Discharge Terminals**

- Typical LNG Production Plant
- LNG Storage and Handling Facilities
- Discharge or Unloading Facilities
- Floating vs On-Shore
- Future Trends
- Other new developments beyond FLNG

**Session 8
1015-1100****FS(R)U and Floating LNG Production**

- Floating Storage and Regasification Units (FSRU)
- Floating Storage and Production
- Prelude Project
- FLNG

Logistical Challenges and Ship/Shore Interface**Session 9
1115-1245**

- Ports, Terminals: Size and Planning
- Annual Delivery Programme and Scheduling
- Ship/Shore interface
 - o line cooling, vapour return, communications
- Emergency shut-down systems
- Annual Delivery Programmes
- Scheduling: art or science?
- Impact of cool-down
- Unloading or Discharge Operations
- Emergency Shut-Down Systems
- Safety Procedures

MODULE VI - VESSEL OPERATIONS**Primary Features of LNG Cargo Handling Systems****Session 10
1400-1445**

- Trading and Tank Condition Cycles
 - o Nitrogen Purge
 - o Drying and Inerting Tanks
 - o Cooling-down
 - o Gassing-up
- Heel Retention

LNG Cargo Operations**Session 11
1445-1515**

- Ship/Shore Check List
- Pre-Cargo Preparations
- Cooling down
- Bulk Cargo Operations
- Topping Off, End of Discharge, Purging/Draining

Cargo Handling Equipment**Session 12
1530-1545**

- Cargo and Engine Control Spaces
- Equipment: Gauging Systems, Cargo Pumps, Compressors, Vaporizer and Oxidizer
- Bulk Cargo Operations
- Topping Off, End of Discharge, Purging/Draining, Heel Retention
- Ballast and Vessel Stability Tank preparation

Ship Management**Session 13
1545-1615**

- International legislation: Registry and Class
- Vetting, SIRE Inspections and Terminal Acceptance
- Officer Experience Matrix
- Insurance: H&M, P&I and cargo
- Ship vs Crew Manager
- Crew Composition, Recruitment, Remuneration and Retention

MODULE VII - VOYAGE & DEAL ECONOMICS**Session 14
1615-1700****Fundamental Cost and Revenue Criteria**

- Core components of Voyage Economics vs. Deal Economics
- Owners vs Charterer: Key Objectives
- Voyage vs. Time Charter
- Freight vs. Hire vs. Daily Value

**Wednesday
24 June****Reflection, Programme for the day and Housekeeping****0830-0845****Session 15
0845-1000****LNG Specific Voyage Economics**

- Freight Earning and Daily Value
- LNGC vs. conventional Voyage Economics
- Heel Retention and the Load and Discharge Cycle
- LNG Tramping

**Session 16
1015-1100****Voyage Economics Performance Analysis**

- Ensuring Performance: Owners vs. Charterer's Duties
- Typical LNG operating models and Critical Success Factors
- Speed and Consumption, "Utmost Despatch"
- Other Clauses in Charter Parties
- Monitoring and Performance Analysis Software
 - Speed and Consumption
 - Utmost Despatch

**Session 17
1100-1115****LNG Freight and Voyage Cost Calculations**

- Comparative economics, worked examples by:
 - Vessel size
 - Type of propulsion plant
 - Impact of assumptions and changes thereto

**Session 18
1115-1245****Case Study: Using Voyage Calculator**

- Demonstration of Voyage Costing Model
- Select own Scenario (as team or individual)
- Analyse results and alternative strategies

**Session 19
1400-1445****Ship Acquisition – CAPEX and OPEX**

- CAPEX: what is included
- OPEX: what is included
- Escalation Clauses in Charter Parties
- Typical costs for LNG carriers

MODULE VIII – LNG PRICING**Pricing and Trading in the Gas markets****Session 20
1445-1530**

- Pipeline Economics and Geo-Politics
- LNG Pricing (project cost+, “S-Curve and Hub)
- Evolution of Gas Market Models (Europe, US and Asia)
- Impact of US exports on LNG Pricing
- Commoditisation and emergence of Trading (and Traders)
- Mini Case Study and Market Jargon Lexicon

MODULE IX – COMMERCIAL**Supply/Demand and Trade Flows****Session 21
1545-1700**

- Energy Transition: the Case for Natural Gas
- Natural Gas in the Energy Mix
- LNG vs Pipeline
- Evolution of LNG flows: Europe, Asia and US
- New projects
- Arbitrage, Optimisation and Trading
- Future Projections

**Thursday
25 June****Reflection, Programme for the day and Housekeeping****0830-0845****MODULE X – CHARTERING****Fundamentals, Players, Objectives and Process Maps****Session 22
0845-0915**

- Owner, Operator, Charterer – a brief explanation
- Evolution of vessel ownership in the LNG market
- Chartering and Commercial Chains
- Objectives of different market players
- “Life of a Deal” Process Map

Charter Party, Cargo Contract and Bill of Lading**Session 23
0915-0930**

- The “Holy Trinity” of international seaborne trade
- Key types of Cargo Contracts
- Incoterms
- Issues with the Bill of Lading
- Things to avoid

Evolution of LNG Chartering Contracts**Session 24
0930-0945**

- A Types of LNG Charter Contracts
- Shelltime to ShellLNGTime 2 to Bimco LNGVoy

Overview of Key (LNG specific) Charter Party Clauses**Session 25
1000-1130**

- Which clauses are typically added as extra clauses
- What clauses are critical
- Which clauses to avoid if possible

Chartering: Players, Preparation, Negotiation & Tactics

- Who are the main players in the LNG market
- Arrival of the independent shipowner
- Arrival of the tramp market
- Preparation for a negotiation
- Negotiating tactics

Session 26
1145-1245**Worked Examples and Case Studies****Session 27**
1345-1500

Final Q&A & Course Conclusion

Session 29
1500-1530**Other Lecturers who have contributed to the course previously****Keith Bainbridge**, *Consultant and former Partner at Platou, London, UK***David Chapman**, *Head of Chartering, GasLog Ltd, London, UK***Dr John M Doviak**, *Managing Director, Cambridge Academy of Transport, Cambridge, UK***Alex Pilkington**, *Operations Manager, Avenir LNG MS Ltd, London and Commercial Shipping Advisor for STASCO****Programme subject to change***