



www.marineInstitute.com

MARINE ENGINEERING & LNG ESSENTIALS FOR NON-TECHNICAL PROFESSIONALS

An in-depth understanding of approaches to maritime engineering, analysis and formal procedures required when confronted in the Marine Engineering field and significant marine losses.



About this Training Course:

This introductory level 3-day Instructor Led course will equip the participants with an in-depth understanding of approaches to maritime engineering, analysis and formal procedures required when confronted in the Marine Engineering field and significant marine losses including Cargo, Ship Fire, Ship Machinery and Collision

The course demonstrates the current ineffectiveness and cost to businesses that do not equip themselves with the technical procedures and resources to manage marine engineering failures and incidents in a maritime environment. The content of the course is designed with maritime organizations, insurers and government agencies in mind.

Delegates will be taken through the details and aspects of marine engineering emphasising on both preventive and reactive measures. Factual case studies and exercises will be used along the way to cement delegates' newly acquired skills and help them apply to real situations. Equally as important, a look at the mind-set of the marine engineer is given through the discussion of inspection reports, thus giving the delegates an additional boost in anticipating potential problems and correcting. Finally, the outlook for LNG and its role in the Energy Transition – towards a lower carbon emissions future – will be discussed.

KEY LEARNING OUTCOMES

- Master the strategies necessary for effective marine engineering
- Equip individuals and response teams with techniques, procedures and resources to manage marine engineering investigations in a maritime environment
- Learn the real value to your business of physical and documentary evidence regarding marine insurance claims
- Manage response to crisis events through clear, defined and concise lines of investigation, responsibility, communication and action
- Ensure compliance to legislation and audit requirements to maintain business continuity
- Protect business image by avoiding serious disastrous and hazardous accidents and effective marine engineering investigation techniques
- Ensure overall safety for LNG operation on the use of correct size and number of fenders and certified tested hoses.
- Become familiar with LNG vessels, operations and LNG equipment.
- Enhance understanding of refuelling, Ship-to-Ship transfer equipment, design, maintenance – and training methods for STS.
- Familiarise the differences of Person in Overall Advisory Control, Mooring Master and Master of the Ship.
- Establish a useful methodology in reducing risk.
- Understand environmental challenges.
- Recognise and understand differences in operations and hazards between oil and gas vessels.
- Understand requirements for LNG vessel compatibility and Optimoor studies and follow an LNG spill response case study

TARGET AUDIENCE

This course will benefit those with a either a background in, or a limited understanding of marine engineering principles and knowledge. This course is suitable to a wide range of professionals but will greatly benefit:

- Asset Managers
- Contract and Procurement Managers
- Cost Estimators
- Fleet Operation Managers and Superintendents
- Insurance Professionals
- LNG Specialists
- Logistics and Cargo Providers
- Marine Educational Development and Capability Officers
- Marine Engineering R&D Officers
- Marine Engineers and Master Mariners
- Marine Operation Managers and Superintendents
- Marine Regulatory and Innovation Specialists
- Marine Surveyors
- OCIMF and SIRE Inspectors
- Operational Managers of Marine Engineering Teams
- Port Operational Superintendents
- Project Managers, Planners, and Engineers
- Safety and Quality Assurance Managers
- Technical Assistants

Learn what participants have said about the Marine LNG Institute Courses;

“For all of us this course as non tech professionals with limited knowledge was great. Very good facilitation of expertise of the trainer,” **Logistics Support Co-Ordinator - BHP Australia**

“It is really good for my team. Lots of Knowledge and a great training program,” **Executive Management – Marsh GRP**

“The overall experience is superb. Greatly assisted me in my role,” **Onshore Support Supervisor – PETRONAS**

This course is intended for the following professionals:

This course is intended for the following professions from the maritime and energy industry:

- Ship Owners and Managers
- Offshore Vessel and FPSO Owners and Operators
- Oil Majors, NOCs and Independents
- Ship Superintendents and Safety Officers
- Ship Officers and Crews (Master, Chief Officers, Chief Engineers etc)
- Bunkering industry Personnel including Loading and Mooring Masters
- STS Service Providers
- Liquid Cargo and Bunker Surveyors
- Ports and Terminal Operators
- P&I Inspectors and Executives
- LNG FSU Owners, Managers, Operators
- Company Assurance Managers and Superintendents
- Project Directors
- Asset Managers
- Project Managers
- Cost Estimators
- Quality Assurance Managers
- Contract Managers
- Procurement Manager. Maritime Legal Counsels or Advisors
- LNG Commercial Managers
- LNG Vessel negotiators
- LNG Project Managers or Engineers
- LNG Commercial Managers
- Vessel Operation Managers
- LNG Business Risk Managers
- LNG Business Development Managers
- LNG Contract Managers
- LNG Sourcing / Purchasing Managers
- Corporate Strategy Managers
- Energy Regulators & Investor Relations Other useful information at a glance:

WHAT YOU GET - Other useful information at a glance:



- ✓ **Marine LNG Institute** – Course Certification & Certificates are issued upon completion
- ✓ **Individualized “One to One” for 2 hours post training!** To further optimise your learning experience from our courses, the Marine LNG Institute also offer individualized “One to One” for 2 hours post training **free of charge**. We help improve your competence in your chosen area of interest, based on your learning.
- ✓ **All Course Material and Research Downloads** from the Marine LNG Institute
- ✓ **Marine LNG Institute - Accreditation Postnominal’s and Certificates**

Course level:	Basic
Maximum number of participants:	20

This course is offered through Online Instructor Led Training format.

More testimonials from past participants about the trainer

It will help us roll out our core strategic developments in the future”, Senior Base Manager, Glencore International

“We have utilised this training for our crew and LNG Tech Superintendents for several years. There are a lot of benefits,” China Shipping Lines (CSL)

“Our future is dependent upon our knowledge this assisted greatly,” Manager, Shell USA

“Technical and informative, very approachable and professional. Logistics Support Officer – PETROBRAS GRP

“The offshore technical aspects to the trainer’s seminars are excellent.,” Strategic Manager, TOTAL ENERGY GRP

3-DAY COURSE AGENDA BELOW

DAY 1:

Ship Machinery

- Operation and maintenance practices
- 2 and 4 stroke and LNG engine installations
- Scavenging
- Injectors and Fuel Oil mix

Diesel and Electric Installations

- Pistons/Liners/Bores/Bearings and journals
- Marine Hydraulic and fluids
- Failures and Prevention measures
- Forces and stress
- Managing the engineering investigations
- Trouble shooting

Exercise & Case Study & Comparison Analysis

- The commercial arguments for LNG as marine fuel
- LNG and Low-sulphur fuels LSFO explained. LSFO vs. LNG as alternative fuel sources

Recent Developments in LNG Procedures and Standards

- Applicable codes
- International Safety Management (ISM)
- Tanker Management Self-Assessment (TMSA)
- International Ship and Port Security (ISPS)
- International code safety of ships using gases as fuel (IGF)

Ship Pumps and Pumping Systems

- Types
- Operation and maintenance practices
- Newtonians laws and principles
- Turbulent flows and rate

Marine Engineering - Fluid Mechanics

- Fluid Technology
- Causes, Failures and prevention
- Aux

Trouble shooting Ship Fuel Oils, Lubrication, and Treatments • Fuel oil

- Operation and maintenance practices
- OWS
- Lubrication Oils
- HFO
- Purification
- Sludging
- Exhaust and Emissions

LNG Operations and Procedures for various delivery methods.

Barge

- Key principles of LNG STS
- Parties involved, pre planning and equipment
- Mooring, operations and manoeuvring
- Cargo transfer operations

Land to Ship

- Truck to Ship (TTS) and Loading Arm options
- Parties involved and roles in preparedness
- Equipment and compatibility
- Key steps in preparation

DAY 1 (CONTINUED):

Poor Bunkers

- Trouble shooting
- Testing
- Failures prevention

Trouble Shooting Workshop and Case Studies

An open forum to discuss and determine specific common failures

- Thrust Blocks
- Shafting
- Shaft bearings
- Propellers and CPP
- Stern Tube bearings
- Pumps
- Fresh water and Oil Supply

Transfer Inspections

- In service inspections
- Service leak testing
- Hose ops and vessels procedures
- Color couplings indexes
- Operational risk profiles in Bunkering
- Inspections and Audit: Rigging
- Inspections and Audit: Wire Ropes
- Inspections: Handling and Chains
- Inspection: Shackles and hardware

Case Study & Exercise

- LNG Transfer Failures Investigation and Root Cause Analysis – Diagnosis, Analysis and Planning

Introduction to LNG Properties and LNG Science

- LNG Properties
- LNG Science and Chemical composition
- General and Specific Risks
- Risk Assessments – Operations, People and Training
- Risk Control measures

Marine Engineering - Failures

- CPP
- Propeller mounting
- Design and Latent engineering failures
- Installation failures shafts
- Mechanical properties and testing
- Vessel performance

Corrosion and Prevention

- Care and Maintenance
- Seals and oils
- Design and engineering installation practices
- Trouble shooting

LNG Safety and Risk Management

- Risk Analysis and Job Safety Analysis – Objectives
- Technical characteristics of LNG
- Handling, storage and spill risk
- Volatile cargo and gas vapours leak from ruptured tanks, Hoses and pipelines, causing oxygen deficiencies
- Gas Hazard Monitoring Equipment for JSA
- Adverse Weather Working – Guideline examples for JSA

Bow Thrusters

- Failures
- CPP
- Care and Maintenance
- Seals and oils
- Design and engineering installation practice

Marine Engineering - Trouble shooting Condition Based Monitoring

- Failures
- Vibration
- Balancing
- Control mechanisms

Visual Inspections

- Other types of inspection NDT and DT
- Design and engineering installation practices
- OEM and Failures
- Internal Wear down and monitoring to prevent
- Condition loading principles

Material Testing

- Marine Systems and machinery design
- Corrosion and maintenance and prevention of ships equipment

DAY 2

Trouble Shooting

- Periodic Prevention measures
- Vessel Performance
- Aux and main engines
- Engine components
 - What happens internally
 - How is power produced
 - Effectiveness and efficiency of 2 and 4 stroke engines
 - Crank shafts

New Fuels in the Marine Industry

- How do they all work?
- Strokes and forces
- New developments in the Marine Engineering field from around the world

Cooling Systems and Pumps

- The 'Slow steam' principles and effects on Main and Aux engines
- Pump installations Pump arrangements and maintenance

Factual Case Studies – How to prevent and identify Hazards regarding 4 and 2 stroke engines aboard vessels

- Trouble shooting
- Testing
- Failures prevention

- Approach to LNG and Installations
- Hose construction and length
- Hose quality and identification

Ship and Offshore Installation and Safety Management Practices

- OIM – Operations inside 500m safety zone
- Manoeuvring; safe approach, weather monitoring
- LNG and Bunkering Cargo handling and Planning
- LNG Installation Data Cards
- Accidental causes – fire on board ships
- LNG, Bunkers and Mechanical energy
- Liquids and gases
- Bunkers, Fire and the Fire Responses safety
- Investigation priorities upon arrival due to Bunkering failure
- Determining the point of origin
- Reconstruction of fire
- Documentation, sketches, sketching systems plotting methods

SWP/JSA Exercise – HSE Health and Safety Workplace Practises SWP/JSA for end-to-end Bunkering LNG

How do the internal mechanics of an internal combustion engine fail?

- Compression within bores
- Ignition and timing
- Chains and belt driven mechanisms
- The 2 and 4 stages of pistons and cylinders
- Exhaust and compression operations
- Timing failures
- Hoses and clamps

Power Head arrangements for 2 and 4 strokes

- EFI and fuel delivery
- Valves and springs for exhaust and air entry
- Effect of compression and ignition
- Manifolds and gaskets
- ECU on 4 and 2 stroke engines
- 4 and 2 stroke engine seals and failures

Pistons - Rod assembly, Bearings and rings

Effects of Corrosion within 2 and 4 Stroke Engines in Marine Environments

- Corrosion
- The effect of exhaust and scavaging
- Air flow, bores and cylinders
- The Combustion Engine explained
- What is an OEM

LNG as a Fuel and Ship Design Configurations

- Current LNG Propulsion Options
- LNG Fuel Tanks
- LNG STORAGE
- LNG Fuel System
- Impacts on Ship Configurations and Operation
- Suitable Ship Types
- LNG and other Ship design efficiencies

LNG and other advanced technologies

- Future: LNG Test and Technology Centre – Liquid Natural Gas (LNG) has characteristics that impacts on ship design and operation
- LNG Fuelled Propulsion for Ships
- Innovative LNG transfer systems
- Development of offshore LNG Transfer
- Robotics and AI technology available
- Fibre optics and software compatibilities
- OEM and aftermarket installations
- Checklists for Marine Surveyors and Engineers

FPSO, FSRU, FPO Systems and Designs

- Factual Case studies and developments
- Recent build designs from South Korea, China shipyards
- LNG vessel past and future design developments
- Development of cryogenic equipment and designs
- BOG Roll over considerations and tank designs
- Cryogenic Hoses designs and testing facilities around the globe
- QCDC
- Manifold, Saddle and ESD 1 and 2 designs

Machinery and How to Prevent Costly Failures

- Discuss planned maintenance systems
- Discuss Trend analysis
- Analysis of Condition monitoring technical CME
- OEM Main Engine component failures relevant to engine performance

DAY 3

Factual case studies concerning failures to propulsion, C.P.P, stern tube and shafts including shaft and design failures in excess of \$125 Million USD

- Shafts
- Stern tubes and bearings
- Propulsion
- Propellers fixed and non-fixed CCP
- Gear box tooth failure
- Ship/Vessel steering and thrust
- Corrosion and fatigue HFO
- M.E Turbo and Super chargers how do they work

Oil and Electrical Systems Engines in the Offshore Marine Industry

- Knowledge in vessel electrical layout
- Knowledge in vessel equipment
- Ship/vessel electrical systems
- The Main Engine and Aux
- Fuels and fuel
- The combustion chamber and lubrication
- Lubrication oils
- Marine Engineering Failures
- Effects of poor lubrication
- Oil Types - what's the difference

Fundamentals of Naval Architecture and Engine Performance - How it affects propulsion and what does it all mean?

- Introduction to Ship Naval Architecture
- Forces
- Centre of gravity
- Movement and stability
- Hydrodynamics
- Ship motion and vibrations
- Intact stability
- Damage and stability
- Degrees of freedom
- Systems and monitoring
- Example of diagrams of forces and degrees of freedom

Vessel Technology and Operations

- Vessel operational preparedness for LNG
- Measures to reduce energy consumption in ship applications
- Cut operating costs while, at the same time, reducing emissions
- Technological efficiencies to reduce energy Consumption in all ship application
 - Tankers and Bulker
 - Containership RORO FerriesOSV

Marine Engineers and Tech Superintendents – Wear down, Fatigue and Failure Management Practices and planning for LNG Fuel and Bunkering

- Overview of SMS & PMS
- Discuss onboard planned maintenance systems – PMS
- Discuss Trend analysis – T.A
- Analysis of Condition monitoring technical – CME
- OEM Main Engine component failures relevant to engine performance

LNG and other advanced technologies

- Future: LNG Test and Technology Centre – Liquid Natural Gas (LNG) has characteristics that impacts on ship design and operation
- LNG Fuelled Propulsion for Ships
- Innovative LNG transfer systems
- Development of offshore LNG Transfer

Marine Engineering Inspection Check Lists

- Engineering
- Human factors
- Survey requirements.
- Condition of vessels hull and machinery
- Defects and efficiency
- Survey procedures

DAY 3

Marine Engineering - Electrical Energy

- Fuses, exposed lights by the type
- Fixtures, motors and engine rooms leaks in fuel Systems
- Welding in burning operations and other energy sources
- Mechanical energy
- Liquids and gases
- Electrical wiring malfunction

How can Marine Engineering Internal Failures and Wear Down Occur?

- Damage from unusual sources
- What can you learn from the external appearance of failures • Coolants and Gas safety Monitoring equipment
- Effects of internal temperatures to 2 and 4 stroke engines
- High temp alarms and failures

Marine Engineers (Marine Engineering - Ship Construction and New Technologies)

- New ship design and Marine
- Objectives Manufacturing technologies
- MARPOL
- Fuel efficiencies
- IMO
- LNG and ships fuel
- STCW
- Low Sulphur Fuels
- CLASS
- Retro fitting

Trouble shooting for Superintendents, Marine Engineers, Surveyors and Offshore Project Managers

- Periodic Prevention measures • Vessel Performance • Aux engines • Main engines • Engine components

Ship Electrical Systems and Fire - Inspection and Investigation

- Accidental causes a fire on board ships
- Classification of fire causes
- Chemical sources, material subject to spontaneous ignition - ships
- Materials, Cargo, Electrical heat energy
- Faulty electric circuits and equipment, replacement parts
- Fuses, exposed lights by the type
- Fixtures, motors and engine rooms leaks in fuel Systems
- Welding in burning operations and other energy sources
- Liquids and gases
- Trouble Shooting
- Electrical wiring malfunctions

LNG for

Exercise: Implementation of end-to-end LNG bunkering

- Developing a 10-point check list to get your LNG Bunkering project off the ground

LNG Shipping

- Carrier Types, Characteristics
- Shipping Contracts (FOB, DES, COA, Chartering)
- Project Shipping Capacity / Business Models LNG Regasification / Terminals
- Process Design and Technology
- Business Models

World LNG Terminals Industry Novelties

- Floating LNG
- Floating Storage Regasification Units (FRSU)
- Floating LNG based Power Generation

MARINE LNG INSTITUTE – COURSE CERTIFICATION & CERTIFICATES ARE ISSUED UPON COMPLETION

Individualized “One to One” for 2 hours post training! To further optimise your learning experience from our courses, the Marine LNG Institute also offer individualized “One to One” for 2 hours post training **free of charge**. We help improve your competence in your chosen area of interest, based on your learning.

REGISTRATION FORM

MARINE ENGINEERING & LNG ESSENTIALS NON-ENGINEERS		✓	NORMAL	✓	<p>Recognise the value of learning in teams. Group bookings at the same time from the same company receive the following: 3 or more at 5% off 5 or more at 7% off 8 or more at 10%</p> <p>All other promotions including early bird are exclusive of the group discount.</p>
MAX 10 PAX					

DELEGATE DETAILS

Delegate 1

Mr Ms Mrs Dr Others: _____

Name : _____

Job Title : _____

Department : _____

Telephone No. : _____

Email : _____

PAYMENT METHODS

By Direct Transfer. Please quote your Students Name with the remittance advise via email to student enrolments via our website. www.marineLnginstitute.com

All bank charges to be borne by payer. Please ensure that the full invoiced amount per student is received in USD.

We do not accept By Credit Card.

As Payment through credit card incurs a 3.5% admin fee payable by the payer. Payment through credit card is not applicable.

Delegate 2

Mr Ms Mrs Dr Others: _____

Name : _____

Job Title : _____

Department : _____

Telephone No. : _____

Email : _____

Company : _____

Address : _____

Country : _____ Postcode: _____

Attention : _____

Invoice to : _____

Telephone No. : _____

Fax No. : _____

PAYMENT POLICY

Payment is due in full at the time of registration and enrolment. Full payment is mandatory for event attendance. By submitting this registration form, you have agreed to payment terms.

CANCELLATIONS & SUBSTITUTIONS

You may substitute delegates at any time. For cancellations received in writing more than seven (7) days prior to the training course, delegates will receive a 100% credit on the amount paid which can be used in another training course for up to one year from the date of issuance.

The credit is transferable to other persons in the same company and applicable against any future public course. For cancellations received seven (7) days or less prior to an event (including day 7), no credit will be issued.

In addition, a cancellation fee equivalent to 15% of the course fee will be charged. In the event that we postpone or cancels a course, delegate payments at the date of cancellation or postponement will be refunded in full. MLNGI does not provide refunds for cancellations and postponements or waive fees for unpaid invoices upon receipt of registration

3 EASY WAYS TO REGISTER

Please note

- Indicate if you have already registered and made payment by Email + or Web.
- If you have not received an acknowledgement by email before the training course, please contact us to confirm your booking.
- Photocopy this form to register multiple delegates.

3 EASY WAYS TO REGISTER

Marine LNG Institute www.marineLnginstitute.com Contact Enquires: Student Enrolments

Email: info@marineLnginstitute.com

Website Portal: [Enrol – Marine LNG Institute](#)

