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OSV, DSV, FSRU OPERATIONS AND LNG TECHNOLOGY

Manage the complexities from operations, technical design to regulatory
Compliance and market positioning



About this Training Course:

This customized 3 day instructor led training program will enhance the knowledge and safety aboard Offshore Support Vessels and FSRU teaching prospective or current employee's offshore terminology and safety during anchor handling, towing and supply operations. The safe handling of ships depends on many factors - on ship's manoeuvring characteristics, crew behaviour, actual environmental conditions, and degree of water area restriction.

Results of analysis of casualties and accidents show that in one third of all, the human error is involved, and the same number of damages is attributed to the poor controllability of ship, cargo and equipment. Training is the most effective method for improving the safety at sea. The goal is to gain broad based theoretical and practical knowledge in Offshore Supply Vessel and FSRU operations. It covers both basic and intermediate levels of experience in the Offshore Industry. The course has been developed and its delivery based upon International Maritime Standards. (IMO). All successful participants will be awarded a Certificate of Attendance Offshore Marine Engineering Failure –OSV and FSRU Operations and Risk Management from the Marine LNG Institute.

The course will provide participants with a thorough understanding of the fundamental principles of Offshore Marine Engineering and Supply Vessels, FSRU, safety, construction, emergency procedures and common industry terminologies regarding design, stability of OSV's and other floating platforms and structures.

The course is designed for participants with a limited to intermediate knowledge of offshore support vessel and FSRU operations including Deck Cadets and Deck Officers entering the maritime industry, and certificated Deck Officers new to the offshore sector. The course is most suited to those with a basic to intermediate level of experience in vessel operations. Participants should hold, or should be undertaking training towards, a minimum of STCW Deck Officer Watch keeper certificate. Participants may benefit from having some previous offshore experience.

Objectives of this Training Course:

- To provide an introduction to **OSV – FSRU and OSI Company policies**.
- Give an introduction to **offshore support vessels, FSRU design and scope of works**.
- Become familiar with the **safety** aspects related to these types of ships and Installations and LNG.
- To **handle and inspect** wires, chains and related equipment properly.
- How to practice safety during **anchor handling, cargo handling**, and towing operations.
- **Equip** individuals and response teams with techniques, procedures and resources to safely operate aboard a OSV and FSRU
- **Manage** operations through clear, defined and concise lines of responsibility, communication and action.
- To have personnel join the vessels with LNG **knowledge** sufficient to enable them to work safely and efficiently onboard the vessels.
- Give **personnel knowledge** of the design, scope of work and especially of the safety aspects related to offshore support vessels, including LNG, and cargo handling.
- **Ensure** compliance to legislation and audit requirements and manage **RISK** to maintain business your business
- **Staff will be able to PROTECT** your business image by avoiding serious disastrous and LNG hazardous accidents and effective operations.
- **Individuals will be RESOURCED** with the key and reliable knowledge and information that allows you to effect seamless operations without LNG incident or loss.

Key Contents and Topics;

- LNG FSRU and OSV Company Procedures and Management Responsibilities
- Basic knowledge in vessel layouts
- Basic knowledge in vessel equipment, Cargo Handling and Securing and LNG handling
- Restraining of cargo
- 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 technology
- Manifold, Saddle and ESD 1 and 2 designs
- LNG Trading route developments
- New production facilities and locations world wide
- New trading routes and hubs developing
- Off-shore industry expansion options for LNG as fuel
- On shore development of infrastructure
- Remote supplies and disaster recovery, portable LNG
- Floating LNG based Power Generation
- LNG Fuelled vessel design and tanks
- FSRU Designs and Technologies
- OSV Engineering failures, Marine Engineering in the OSV – FSRU sectors

- General Requirements – transfer operations of Cargo and LNG STS/Bunkering
- Hazards
- Rig Manoeuvring and agreed procedures and Responsibilities
- Towing Operation – Planning, Rules
- Risk management and JSA/SWP
- Adverse weather working guidelines
- LNG Operations and Supervision
- Checklists for OSV, LNG FSRU and Install Operations
- Planned approaches to offshore facilities.
- Risk assessment and planning for entering the 500m safety zone.
- Review machinery and power requirements in various situations/operations.
- Introduction to joystick manoeuvring and change-over procedures.
- Offshore installations, LNG and support vessel types and operations overview.
- Offshore Regulation, including flag state, PMA, Marine Orders, NWEA
- Operations inside 500m safety zone;
- Introduction to OSV/FSRU manoeuvring; safe approach, weather monitoring,
- DP – Dynamic Positioning
- LNG and Cargo Planning
- Installation Data Cards
- Communications
- Hoses and Connection guidelines
- Anchor handling set up systems
- Crane Operations and recognised forms of communication
- Vessel Deck Crew procedures
- Emergencies and Search and Rescue

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.

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
- OSV Operator and Anchor
- 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
- Project Planners
- 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

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 Post nominal's and Certificates**

This course is offered through Online Instructor Led Training format and ‘In House’ training worldwide.

More testimonials from past participants about the trainer

“We have utilised this training for our crew and LNG Tech Superintendents for several years,” **Tech Superintendant China Shipping Lines (CSL)**

“In this technical LNG Maritime field particularly in the future - this course is of great benefit to our teams,” **Senior Manager, CMA CGM Group**

“Marine LNG Institute Courses are very technical and informative, very approachable and professional”. **Corporate Strategist Evergreen Marine Corp**

“To have this training at our disposal. When we want is terrific. The Corporate In House Trainer was a key element to this course’ **Onshore DPA - Maersk Lines**

“The offshore technical aspects to the trainer’s seminars are excellent,” **Offshore Manager, OOCL Lines**

“Technology develops quickly. I really enjoyed the course elements and its delivery” **Chief Technology Officer [CTO] - RIO TINTO PLC**

3 DAY COURSE AGENDA

Overview and General Arrangements of Offshore Supply Vessels and FSRU

Company Procedures and Management Responsibilities
Basic knowledge in vessel layout
Basic knowledge in vessel equipment
Cargo Handling and Securing

DP – Dynamic Positioning and (Case Study)

'Knowledge of Existing and New Technology's regarding vessel positioning and safety for the seafarer.'

What is D.P.?

How is it utilised aboard Offshore Supply Vessels?

Why is it so effective?

Occupational Health and Safety Requirements aboard

OSV's and FSRU

PPE and Tool Box Procedures
Risk management and JSA/SWP
Adverse weather working guidelines
Checklists for OSV and Install Operations

Operational Risk Assessments of OSV's and FSRU

Planned approaches to offshore facilities.
Risk assessment and planning for entering the 500m safety zone.
Review machinery and power requirements in various situations/operations.
Introduction to joystick manoeuvring and change-over procedures.

Planning and Monitoring

Offshore installation and support vessel types and operations overview.
Operations inside 500m safety zone;
Introduction to OSV manoeuvring; safe approach, weather monitoring,
Cargo Planning
Installation Data Cards

Global LNG and Oil Facilities and Infrastructure

Existing and emerging
Potential and worldwide energy needs for LNG
Why LNG?
Future and current developments
Commercial arguments

LNG trading route developments Asia Pacific Regions, Europe, Africa, USA and Russia

New production facilities and locations
New trading routes and hubs developing
Specific Focus on Asia Pacific Trading, Africa, Europe, Middle East and Production Futures
Off-shore industry expansion options for LNG as energy and fuel
On shore development of infrastructure
Remote supplies and disaster recovery, portable LNG
LNG Storage & Regasification
Sales & Purchase Agreements (SPA)

The OSV - Marine Engineering Field and LNG

Propulsion
Fuels and fuel problems
Lubrication oils
Bilge, ballast, Fire and deck wash systems
Marine Engineering Failures
Corrosion
Security
Machinery arrangement
Engine room ventilation
Conditions of ME rooms
Diesel Engines
Liner Lacquering
Piston damages and rings
Exhaust and inlet valves and piston rods
Crank shafts
Damage from unusual sources
What can you learn from the external appearance of failures
Propulsion systems
Shafts
Stern tubes and bearings
Propellers fixed and non-fixed CCP
Gear box tooth failure
Ship steering

Installed Equipment, Communication Practices aboard OSV's

Communications
Hoses and Connection guidelines
Anchor handling set up systems
Crane Operations and recognised forms of communication

CASE STUDY LNG Fuel and FSRU Operations

Attendees will be shown photographic, media coverage and investigative and documentary material from an actual critical maritime safety, engineering and environmental incident

The Case Study reflects upon the issues involved, training and demonstrates the current ineffectiveness and cost to businesses that do not equip themselves. Lessons Learnt exercise.

Hazards, Responsibility and Transfer Operations

Restraining of cargo
General Requirements – transfer operations
Hazards
Rig Manoeuvring and agreed procedures and Responsibilities
Towing Operation – Planning, Rules

Salvage operations, distressed vessels and marine engineering.

Gas safety and Monitoring equipment
Introduction to Restoring the water tightness envelope methods

Stop Flooding water and reducing flow rates aboard
Salvage Planning
Introduction to Naval Architecture, stability and theory
Rigging
Wire Rope Inspections
Chain and Fibre lines

Elements of Lifting – Buoyancy, Tidal and Refloating
Weld plating, wooden and concrete theory
Sinking preparation, measuring, Boxing and dewatering

Spot vs Term Contracts Exercise: Routes/Distances LNG Storage, Transfers New Shipping Technologies and Definitions

LNG Design Configurations

- LNG Fuel Tanks
- LNG Storage
- LNG Fuel System
- Impacts on Ship Configurations and Operation
- Suitable Ship Types
- LNG and other Ship design efficiencies
- Retro fitting of existing vessels with LNG technology
- Introduction, Definitions
- Cargo Containment & Management
- Propulsion Systems
- Boil-Off, Heel, Re-liquefaction

Gas / LNG Industry Overview

- Gas / LNG chain and definitions
- Gas transmission technologies: Comparative summary of pipeline, LNG, CNG and GTL
- Technology innovation developments: Shale gas, FLNG, FRSU, small scale LNG
- Measurement units applicable to gas /LNG units

LNG Energy Investment Market Overview

- Overview of natural gas sector
- International pipeline trade
- LNG trade
- Regional markets: Profile of gas trade of Africa, Atlantic, Middle East, Asia Pacific, Europe and USA
- Geopolitical issues
- Gas / LNG market structure and gas industry regulatory issues

Claims for Shortage of Oil/LNG Cargo – Statistics

- Overview of LNG Supply Chain
- 'Boil-Off' During the Voyage and Bunkering
- Owners' Warranted Performance
- BIMCO / GIIGNL / CTMS / LNG HEEL
- Charterparties for the Carriage of LNG Cargo
- LNG Radar Ullage
- Owners compensate
- Changes in chemical characteristics whilst in Transit
- LNG Risk control Mechanisms
- Parties responsible for 'cool down'
- Examination of the Contractual Allocation of Risk under LNGVOY

CASE STUDY – FSRU Foreseeable Ballast voyage

- Reinforce knowledge about operations that are carried out in accordance with all relevant national and international maritime legislation, local regulations, and industry best practices.
- Evaluate the different procedures and factors affecting cost of the operation.

OSV Regulatory Requirements

Offshore Regulation, including flag state, PMA Marine Orders, NWEA

Marine Engineering, LNG and Fire Causes - 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.
Housekeeping.
Mechanical energy.

Marine Engineering and Fire Scene - Points of Origin and the Science of Fire

- Fire investigator safety
- Fire scene hazards
- Investigation priorities upon arrival.
- Science of smoke and fuel.
- Determining the point of origin.
- Reconstruction of fire.
- Documentation, sketches, sketching systems plotting methods
- photographs summary

Search and Rescue, Emergency and Security aboard OSV's

- Vessel Deck Crew procedures
- Safe equipment, Training and Competencies
- Emergencies and Search and Rescue
- International Maritime Protocols. - IMO

LNG - Transfer Procedures

Loading and Discharging Operations and Preparations

- Arrival preparations and checklists
- Pre-loading procedures alongside
 - Cryogenic pumps and hose design parameters
 - LNG Carriers and mooring options - Finger and Face terminal design considerations
 - Fire Fighting and Investigation
- Ramp up, loading and ramp down, actions and precautions
- Ramp up, increasing loading rate
- Tank loading procedures
- Ramp down and the topping off tanks process
- Vapour pressure control

Plan and Review STS / FSRU Exercises

- Plan review and discuss checklists and equipment items required
- Confirm any training requirements

Introduction to Simulation training and bridge team resources management

LNG FSRU - Custody Transfer Measurement Agreements and Economic Calculations for Commercial and Domestic infrastructure and Shipping

- How it's done
- LNG Long-Term duration Investments
- OEM commercial and domestics suppliers of new Technology for heavy industry
- National Energy supplies of LNG for Industry Investments
- System setup parameters
- Joint Venture Agreements and Investments
- Collaboration between Large Exporters and Importers
- Ship and surveyor roles
- Certificate of Loading

Types of LNG Custody Transfer Measurement Systems and Equipment

- Liquid form measurement
- Volumetric measurement
- Temperature measurement
- Custody Transfer Measurement system
- Dynamic Metering
- Ultrasonic Metering
- Vortex Metering
- Colirious Metering
- (CTMs) testing and checks
- LNG Custody Transfer Procedure

Pre-planning and Risk Assessment Considerations – FLNG/FSRU

- What is LNG? Hazards and Risks vs. Oil
- Screening / Compatibility Studies of participating vessels
- Ship compatibility, and OPTIMOOR
- Criteria in selecting transfer area and Approval from the authorities
- Security issues
- Preparations
- Risk Assessments and Management, Helicopter operations, Cargo Hazards, weather conditions, personnel injury, mooring unmooring operations
- Oil v/s LNG any differences? LNG and Liquid/Gas Transfer System Architectures and available technologies
 - Ship to Ship to shore
 - Ship to Platform
 - Ship to Ship
 - Barge to Ship

- Arrival preparations and checklists
- LNG Loading Arms – Technology, vendors and designs

- Cryogenic Hoses, testing and type 8 inch and 6 Inch
- Dynamic Positioning
- Manoeuvring with and without tug assistance or DP
- Jetty Approaches – Finger or Face Terminal Design Interface
- Pre-loading procedures alongside
- Ramp up, loading and ramp down, actions and precautions
- Ramp up, increasing loading rate
- Tank loading procedures
- Ramp down and the topping off tanks process
- Vapour pressure control
- Post loading operations
- Commencement of gas burning and line disconnection
- Pre-arrival preparations, terminal requirements and ship line cool down
- Discharging and ramp down, heel options
- Overview of standard discharge operations
- Ramp down for heel distribution option •discharging operations

LNG Infrastructure decisions, location, designs, equipment

- Optimum location and equipment required
- LNG supplier contract and bunker cost to vessels
- Equipment types, storage tanks, pumps, Road rail requirements
- Emergency response facilities

LNG Project Facility Development

- Decide on location and facilities
- What operations will we do and how
- HAZID, what are the project risks
- Costing, development time, personnel
- Technical issues in LNG Bunkering Facility Development
- Feasibility assessment for a small-scale LNG project

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 Cost of delivered LNG highly impacted by ship size and sailing distance between supply hub and user

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)

- FLNG and FSRU
- Ship connected transfer systems and tandem configurations
- System Uptime considerations of effective operations
- Metocean conditions, prediction tools

FLNG Custody Transfer Measurement and Calculations – CASE STUDY LNG SPILL RESPONSES

- System setup parameters
- Sampling and Certification Custody
- LNG Quality controlled transfers – Forensic and laboratory analysis
- Quality Management systems for LNG transfer and analysis
- LNG probes, equipment and software infrastructure to ensure quality control between vendors and buyers
- Ship and Terminal LNG Quality Control
- Transfer Guidelines of Terminals Ship and surveyor roles
- Certificate of Loading
- Types of Custody Transfer Measurement
 - Liquid/Gas Quality and Management during transfers
 - Quality Management Systems for Liquid/Gas
 - Terminal and ship systems and Equipment
- Inerting
- Aerating
- (CTMs) testing and checks

LNG Compatibility Risks

- FSRU and STS OPTIMOOR studies
- Simulator training for FSRU and STS equipment
- Cargo discharge
- LNG Cargo Unloading arms and Hoses

STS / FSRU – Best Practices Oil and LNG comparisons

- Discuss main considerations
- FSRU Operational Case Study
- Time / durations / Locations and Regulations
- Basic questions
- Contracts objectives
- Gas / LNG chain contracts
- Operational, commercial and legal basis for long-term contracts
- Contract perspectives of Buyer and Seller: Obligations, risk mitigation and value

LNG and OSV 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

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

LNG Trading route developments

- New production facilities and locations
- New trading routes and hubs developing
- Off-shore industry expansion options for LNG as fuel
- On shore development of infrastructure
- Remote supplies and disaster recovery, portable LNG
 - Floating LNG based Power Generation

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

Parties involved in FLNG/FSRU and their Relationship to One Another

- How Parties involved (Oil/Gas Majors, Charterers, Service Provider, Cargo Surveyors, POAC, Ships' masters and Mooring Master) work harmoniously to attain operational efficiency and safety

LNG and other advanced technologies

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Checklists for Marine Surveyors and Engineers

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

OSV, FSRU,,DSV Operations and LNG Technology [3 days]		✓	NORMAL MAX 10 PAX	✓	<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>
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DELEGATE DETAILS

Delegate 1

PAYMENT METHODS

Mr Ms Mrs Dr Others: _____

Name : _____
Job Title : _____
Department : _____
Telephone No. : _____
Email : _____

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. : _____

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](#)

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.

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

