INTRODUCTION TO FLNG/FSRU TECHNOLOGY

Comprehensive Overview of FLNG and FSRU Technology with A Focus on Real World Solutions

18th - 19th August 2014, Singapore

Petrosync Lecturer

Robert W Kamb Jr
Managing Partner of Mystic River Partners LLC

Professional Summary

- LNG Marine Operations Subject Matter Expert with 30 year record of high achievement
- Managing Partner, Mystic River Partners LLC, Owner and Principal Consultant, Kamelot Marine Services
- Provide LNG marine operations and business development advice to major energy and marine transportation companies
- 15 years as senior officer aboard deep-draft LNG vessels transporting cargoes for demanding charterers and owners in the world-wide liquid gas trade
- Strong commercial, finance and economic knowledge
- Significant shore side operations management experience with broad knowledge of project development

Course Overview

Introduction to FLNG / FSRU Technology 2014 is a comprehensive 2 day program designed to familiarize participants with the development and maturation of Floating LNG solutions, with a focus on real world solutions and actual projects. As LNG enters its 6th decade of global trading, innovative solutions are continually advancing as market participants seek to enhance value and fully monetize natural gas assets in an ever more competitive environment.

Being the traditional core region of the LNG business, South East Asia is the location of the majority of proposed and currently operating offshore LNG industry development. Southeast Asia is particularly unique with its multi-market focus on LNG import, export and domestic distribution, making up-to-date LNG awareness and experience based FLNG / FSRU training essential to LNG and Marine businesses and stakeholders in the region.

The program provides a comprehensive overview of both floating LNG (FLNG) and floating storage and regasification units (FSRU). The role and function of offshore LNG and its place in the LNG value chain is strongly emphasized along with practical operational aspects and technological solutions at the deck plate level.
This 2 day course has been designed with a flexible curriculum and subject matter that can accommodate project development and operations staff with a need for design, engineering and technological insights as well as office and executive staff who need to understand the “big picture” economics, regulatory aspects and business strategies related to FLNG projects.

Beginning with a walk through of “LNG 101” and the LNG value Chain, participants will learn:

- **Overview of the LNG Value Chain and the Role of Offshore LNG.**
- **Economics Of The Global Gas Market: Where Does FLNG Fit In?**
- **Keeping FLNG real: Examination of current and proposed projects.**
- **Key Technical Challenges In Adapting LNG Technologies For Offshore.**
- **LNG Containment Systems Key Considerations.**
- **Offshore LNG Transfer Systems: Ship To Ship Transfer Configurations, Limits, Equipment.**
- **Overview of Current and Planned FSRU Projects.**
- **Designing an FSRU: What Are the Key Issues to Address?**
- **The Unique Regulatory Challenges Of FLNG: Critical Safety Issues, Risk Assessment; Technology Choices, Operational Issues.**
- **New Technologies And Innovations For The FSRUs Of The Future – What Is The Likely Shape Of The Next Generation Of FSRUs?**
- **In Depth Analysis Of The Stranded Gas Fields Available Globally. Which Will Be Suitable For FLNG Projects? What Are The Crucial Considerations?**

### Course Objectives

By the end of this course you will:

- Understand the LNG value chain and its application to FLNG / FSRU project economics.
- Appreciate commercial aspects and financial considerations of different types, scales and locations of FLNG projects.
- Be familiar with the current state of FLNG / FSRU development: what has been built, what is proposed and the lessons learned applicable to next generation FLNG / FSRU projects.
- Understand basic design concept of FLNG / FSRU projects, design and engineering requirements and maintenance/inspection philosophies of offshore LNG.
- Be equipped to realistically assess offshore LNG Project criteria, key performance indicators, project costs, LNG production, project execution risks and applicable HSE issues.
- Understand FLNG / FSRU safety, emergency shutdown, fire and gas detection, novel aspects and application in LNG transfer, conceptual system design.

### Specially Designed For

- Marine engineers
- Process engineers
- Operation engineers
- Design engineers
- Project engineers
- Project managers
- Operation managers
- Offshore superintendents
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Course Agenda

Section One - Introduction to LNG Value Chain and Global Trading
- LNG 101: History, Properties and Characteristics of Liquefied Natural Gas
- Development of LNG Markets and LNG Shipping
- Overview of Offshore LNG and its Place in the Global LNG Value Chain

Section Two - Keeping It Real: Offshore LNG (FLNG / FSRU) Project Status Overview
- Currently Operating Offshore / Nearshore LNG Projects
- Proposed Offshore LNG Projects
- What Works: Lessons Learned, Performance Metrics
- Global Trends and Market Dynamics

Section Three - Overview of Floating LNG Project Development
- Site Selection Criteria
- FLNG Design, Engineering and Operating Philosophy
- Technology Overview
- Construction Options

Section Four - LNG Transfer Operations
- Ship to Ship (STS) Operations
- Side-by-Side and Tandem Operations
- Cargo Transfer Methods: Choices and Challenges

Section Five - LNG Production, Sales and Marketing
- Global Trading, Market Projections and Pricing Trends
- Sales and Purchase Agreements, Ship Charters
- LNG Shipping: Optimization and Integration
- Alternate and Unconventional Markets

Section Seven - Managing Risk: Quantitative Assessments, Optimizing Safety
- Developing Realistic Risk Assessment
- Implementing Risk Control Measures
- Operations, Maintenance and Security Procedures

Section Eight - Overview of Floating Storage and Regasification
- Advantages of FSRU concept
- FSRU Market Structure
- Current Market Overview

Section Nine - Developing FSRU Projects
- Project locations
- Offshore Project Development
- Jetty based Project Development
- FSRU Ship / Shore Interface
- Environmental Considerations
- Pipeline / End User Interface
- Vessel Suitability
- Regas System Design and Engineering
- Conversion

Section Ten - FSRU Operations
- Operations Overview
- Crew and Staff Training
- Managing Logistics, Maintenance
- Commercial Issues 10.1.3.1. Measurement, Custody transfer, flow metering
- STS Transfer 10.1.4.1. Managing Inventory
- Downstream Factors
- Pipeline / End-User Interface

Section Eleven - FSRU Case Study

Program Schedule

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<tr>
<th>Time</th>
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<tr>
<td>08:00</td>
<td>Registration (Day 1)</td>
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<tr>
<td>09:00</td>
<td>Session I</td>
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<tr>
<td>11:00</td>
<td>Refreshment &amp; Networking Session I</td>
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<tr>
<td>11:15</td>
<td>Session II</td>
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<td>13:00</td>
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<td>Session III</td>
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<td>15:45</td>
<td>Session IV</td>
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<td>17:00</td>
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Bob Kamb has been involved in the LNG business for nearly 4 decades. During his 15 year career sailing on LNG Carriers, he was responsible for the safe loading, carriage and discharge of 180 cargos totaling over 22 million cubic meters of LNG. Upon coming ashore in 2000, Bob applying his knowledge of LNG marine operations as a consultant to BG LNG, Sea River Maritime, National Grid, SPT Offshore and Excelerate Energy.

In January of 2012, he was named Managing Partner of Mystic River Partners LLC providing expert solutions to a diverse range of marine operations challenges. His most recent work includes LNG marine operations advice for shipping companies and Energy Major FLNG, FSRU and shore based projects, business development and LNG marine transportation solutions for US companies exploring the small scale and LNG fuel market and as a contributor to the IGF correspondence group developing international LNG fueling standards for the IMO.

Bob’s 30 plus years of experience in the LNG marine industry have given him a strong grasp of LNG operations from the deck plates to the C-suite, which he uses to provide practical, relevant, real world training, knowledge and advice. He is a graduate of the Massachusetts Maritime Academy with a BS (Honors) in Marine Transportation. Bob holds a USCG license as Master, Unlimited, and has presented on LNG as a Marine Fuel at numerous conferences and seminars in the US and abroad.
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INVESTMENT PACKAGES

Please checklist the package that you are attending!

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<tr>
<th>Investment Package</th>
<th>Deadline</th>
<th>Course Fee</th>
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<tbody>
<tr>
<td>Standard Price</td>
<td>15th August 2014</td>
<td>SGD $ 2,195</td>
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<tr>
<td>Early Bird Offer</td>
<td>18th July 2014</td>
<td>SGD $ 2,095</td>
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<tr>
<td>Group Discount (3 or more delegates)</td>
<td>15th August 2014</td>
<td>10% discounts for group of 3 registering from the same organization at the same time</td>
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Get a free gift when you register and pay for the full Standard Price 2 days masterclass before early bird deadline!

* Important: Please note that registration without payment will incur a SGD 200 administration fee.

PAYMENT METHODS

By Credit Card
Please debit my credit card: [ ] Visa [ ] MasterCard [ ] AMEX Security Code: __________
Card Number: __________ Expiry Date: __________

By Direct Transfer: Please quote invoice number(s) on remittance advice
PetroSync LLP Bank details:
Account Name: PetroSync LLP
Bank Number: 7144 - Branch Code: 001 - Account No: 010-2255-105
Name of Correspondent Bank: Standard Chartered Bank, 6 Battery Road, Singapore 049909
SWIFT Code of Correspondent Bank: SCBLSGSGXXX
All bank charges to be borne by payer. Please ensure that PetroSync LLP receives the full invoiced amount.

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I agree to PetroSync’s terms & conditions, payment terms and cancellation policy.

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PAYMENT TERMS: Payment is due in full at the time of registration. Full payment is mandatory for event attendance.