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SPE Applied Technology Workshop

FLOATING LIQUIFIED NATURAL GAS (FLNG)

26-29 September 2010

Shangri-La's Rasa Ria Resort • Kota Kinabalu, Sabah, Malaysia

Workshop Description

The international LNG industry has seen sustained growth since its inception in 1964. Natural gas is liquefied to enable transportation where pipelines are impossible or uneconomic. Specialised facilities are required to liquefy, store, ship, receive and return the liquid gas to its natural state – and each stage of this chain is interdependent of each other.

Gas has significant economic and environmental advantages as a fuel and as distances between gas reserves and markets increase, and as economies seek to diversify their energy sources, the sustained growth of production and trade in LNG will continue.

There are many stranded offshore gas fields that are either too small or too remote to be developed via pipeline or onshore LNG liquefaction facilities, and there is renewed interest in developing these gas fields through utilisation of floating liquefaction and storage (LNG FPSO) facilities.

In addition, a recent development has been the growth in floating LNG storage and regasification (FSRU) facilities, being utilised either at locations where onshore import terminals are difficult to approve (such as recent FSRU projects in the USA) or where the timeframe for implementation of a traditional onshore facility is excessive (such as recent FSRU projects in Chile, Brazil, Argentina, Dubai, etc).

Workshop Objectives

This workshop will provide participants with a broad understanding of the LNG industry and the stages in the LNG “chain”, focusing on how to deal with the main challenges and risks of floating LNG; both LNG FPSO and FSRU. The objective is to provide participants with knowledge of both technical and commercial concepts, enabling them, on completion of the Workshop, to reach informed decisions from sharing their experiences from floating LNG projects.

Specific subjects to be covered include the:

- Overall FLNG supply chain including commercial overview.
- LNG FPSO and FSRU processing schemes, including the; design basis, operating principles and conditions of the main processes; technology of the equipment used for LNG liquefaction, storage, loading/unloading, regasification; marine and shipping facilities; commissioning and operation; safety aspects specific to the design and operation of FLNG installations
- Typical investment costs, project schedules and project economics.
- Risk assessment and ideas for mitigation.
- Current and planned offshore LNG FPSO and FSRU developments.

Who Should Attend

This workshop will be of particular interest to professionals, researchers, and service and technology providers from the upstream and downstream segments of the E&P industry, academicians, government officials, etc. Registrants are also encouraged to present case studies and other experiences as discussion leaders.

For more information, visit the SPE Web Site at:

<http://www.spe.org/events/10ako3/>

or please contact SPE Asia Pacific Office

Tel: 60.3.2288.1233 • Fax: 60.3.2282.1220

E-mail: jvaldes@spe.org

FLOATING LIQUIFIED NATURAL GAS (FLNG)

PRELIMINARY TECHNICAL AGENDA

Sunday, 26 September 2010

1400-1600 hours Programme Committee Meeting

1500 hours Hotel Check-in

1700-1900 hours SPE Registration

0600-0700 hours Discussion Leaders and Session Managers/Moderators Briefing

1930-2130 hours Welcome Reception/Dinner

Monday, 27 September • 0830-0930 hours

SESSION 1: INTRODUCTION/OPENING/ KEYNOTE ADDRESS

0930-1000 hours Group Photo/Coffee Break

Monday, 27 September • 1000-1200 hours

SESSION 2: SETTING THE SCENE

Session Co-Chairpersons/Moderators:

Eric Jeanneau, TOTAL

Geoff Hunter, Santos Ltd.

- LNG value chain, field opportunities, number of potential fields, main locations, project drivers.
- Typical design basis, regional considerations, country specifics eg. Need for local content, typical reservoir size, typical feed gas specifications, typical flowrates & design life.

1200-1300 hours Lunch

Monday, 27 September • 1300-1430 hours

SESSION 3: MARINE CONSIDERATIONS

Session Co-Chairpersons/Moderators:

Jean-Yves Gourmelon, Tidewater Marine Australia

Joe Rousseau, ABS

Junghan Lee, DSME

Marin Abelanet, Acergy

- Location & sea states
- Type of vessels & containment (spherical, membrane, prismatic, Type C) - pros and cons
- Sloshing considerations (location dependent)
- Conversion vs. newbuild – pros and cons
- Mooring of the facility – options, drivers
- Access for export / import vessels (tugs & pilotage)
- Deck space available, congestion
- Product storage considerations (LNG, LPGs and condensate)
- Product transfer systems – fixed arms vs. hoses, pros and cons (significant wave height etc.)

1430-1500 hours Coffee Break

Monday, 27 September • 1500-1630 hours

SESSION 4: FACILITIES (TOPSIDES) CONSIDERATIONS

Jos Leo, Lummus Technology

Bas van den Beemt, TNO Science and Industry

Faleh Al-Saadoon, Texas A&M U. - Kingsville

- Gas treatment - acid gas removal, water removal, Hg removal (technologies available)
- LPG and condensate removal (technologies available)
- Liquefaction (technologies available, efficiencies, safety, modularisation)
- Utility systems
- Compression drivers (gas turbine, all electric LNG?)
- All above to consider ship motion, shipyard fabrication, assembly, packaging etc
- How to determine the optimum facilities for a particular project - drivers

Monday, 27 September • 1630-1800 hours

SESSION 5: OVERVIEW OF CURRENT CONCEPTS ON OFFER

Session Co-Chairpersons/Moderators:

Geoff Hunter, Santos Ltd.

Brian Songhurst, Energy & Power

Review of the current contractor packages on offer

- Review current concepts under design development by the major operators – FEED & Conceptual
- Compare the concepts and map them for different applications
- Identify the lessons learned from LNG-FSRUs, oil FPSOs, FPLG projects

1930-2130 hours Group Dinner

Tuesday, 28 September • 0830-1030 hours

SESSION 6: CAPITAL COST & SCHEDULE

Session Co-Chairpersons/Moderators:

Nicolas Jestin, SAIPEM

Eric Poggioli, Technip

- Typical costs stated to date, major cost drivers
- Availability (mainly with regards to transfer system), performance and Return on Investment
- Benchmarking and metrics with other stranded gas concepts e.g. pipelines, CNG, GTL (compact GTL for Petrobras)

1030-1100 hours Coffee Break

FLOATING LIQUIFIED NATURAL GAS (FLNG)

PRELIMINARY TECHNICAL AGENDA (CONTD.)

Tuesday, 28 September • 1100-1300 hours

SESSION 7: RISK ASSESSMENT & MITIGATION

Session Co-Chairpersons/Moderators:

*Michael Livingston/Carolina Rubiano, WS Atkins
Ernst Meyer, DNV*

- Technical aspects (marine and facilities)
- Project execution (interfaces, integration)
- Cost & schedule (overruns, delays, new technology, approvals, classification)
- HSE considerations: lessons learned, fire and blast, layout, Computational Flow Dynamics, Management of LNG Spillage
- Reliability and Availability
- Modelling simulation for new technology
- Marine considerations

1300-1400 hours Lunch

1400 hours Rest & Recreation/Networking
Opportunities/ Dinner on own

Wednesday, 29 September • 0830-0930 hours

SESSION 8: CONTRACTING AND LICENSING STRATEGIES

Session Co-Chairpersons/Moderators:

*Duncan van Bergen, McKinsey & Co.
Jean Yves Gourmelon, Tidewater Marine Australia*

- Small-scale and large-scale
- Intellectual property and ownership
- Regulations and permitting
- Regulatory Compliance

0930-1000 hours Coffee Break

Wednesday, 29 September • 1000-1200 hours

SESSION 9: MODELLING THE VALUE CHAIN

Session Co-Chairpersons/Moderators:

*Oghenero Ozobeme, TOTAL E&P Nigeria Ltd.
Eric Jeanneau, TOTAL
Abel Nsa, Dept. Petroleum Resources*

- Expected production costs
- Commercial considerations, spot market,
- Ways of mitigating lost production due to new technology down time
- Typical sales contracts – ways of mitigation commercial risks

Wednesday, 29 September • 1300-1430 hours

SESSION 10: FSRU TECHNOLOGIES AVAILABLE

Session Co-Chairpersons/Moderators:

*Junghan Lee, DSME
Brian Songhurst, Energy & Power*

- Review of current project – in operation and under construction e.g.
- Hull/storage options
- Vaporizers – different types available, drivers
- Gas transfer (turret, arms etc, drivers)
- Mooring options and drivers (inshore vs. offshore)
- Jetty option for inshore (side by side)
- Conversion vs. newbuild – pros and cons (for and against)

Wednesday, 29 September • 1430-1530 hours

SESSION 11: LNG TRANSFER SYSTEMS SESSION

Co-Chairpersons/Moderators:

*Bas van den Beemt, TNO Science and Industry
Ernst Meyer, DNV*

- Offshore LNG Transfer from ship-to-ship is one of the enabling technologies to support a LNG supply chain offshore. Unlike transfer operations at a protected port terminal, ships are not protected for wind and waves during offshore transfer.
- New transfer technologies and methods have to guarantee maximum terminal availability without making concessions to safety, reliability and operability in floating LNG Processes.

1530-1600 hours Coffee Break

Wednesday, 29 September • 1600-1700 hours

SESSION 11: LNG TRANSFER SYSTEMS SESSION (Con't)

Co-Chairpersons/Moderators:

*Bas van den Beemt, TNO Science and Industry
Ernst Meyer, DNV
(Con't)*

1900-2100 hours Group Dinner

Thursday, 30 September 2010

0730-10:30 hours Breakfast at leisure

1200 hours Hotel check-out

FLOATING LIQUIFIED NATURAL GAS (FLNG)

Documentation:

1. Proceedings will not be published; therefore, formal papers and handouts are not expected from speakers.
2. Work in progress, new ideas, and interesting projects are sought.
3. Professionally-prepared visual aids are not required; handwritten viewgraphs are entirely acceptable.
4. Note-taking by participants is encouraged. However, to ensure free and open discussions, no formal records will be kept.

Workshop Deliverables:

- The committee will prepare a full report containing the highlights of the Workshop discussions. This report will be circulated to all attendees. A one-page summary will be prepared by the Workshop Co-Chairperson, which will be posted on the SPE Web Site, and published in the Journal of Petroleum Technology (JPT), if space permits. The copyright of the Summary Report will belong to SPE.
- PowerPoint presentation materials will be posted on a specific SPE URL address after the Workshop. Provision of the materials by the discussion leaders will signify their permission for SPE to do so.

Commercialism:

In keeping with ATW objectives and the SPE mission, excessive commercialism in posters or presentations will not be permitted. Company logos must be limited to the title slide and used only to indicate the affiliation of the presenter and others involved in the work.

Attendance Certificate:

All attendees will receive an attendance certificate attesting to their participation in the Workshop. This certificate will be provided in exchange for a completed Workshop Questionnaire.

Continuing Education Units:

This workshop qualifies for SPE Continuing Education Units (CEU) at the rate of 0.1 CEU per hour of the ATW.

Attendees' Information:

General and detailed accommodation information will be forwarded to registrants with the attendee package prior to the scheduled Workshop, September.

Transportation/Visa:

All delegates are advised to book their international airline tickets early from their country to Kota Kinabalu, Malaysia. Further detailed transportation information will be available and included in the attendee package upon registration. All travelers to Malaysia must be in possession of passport valid for at least six (6) months with proof of onward passage, either return or through tickets. Please check with your travel agent for information on visa requirements to Malaysia.

Dress Code:

Casual clothing is recommended. The Workshop atmosphere is informal.

Workshop Venue:

Shangri-La's Rasa Ria Resort

Pantai Dalit Beach, 89208 Tuaran, Sabah, Malaysia

T: (60 88) 792 888 • F: (60 88) 792 777

www.shangrila.com/en/property/kotakinabalu/rasariaresort

REGISTRATION FEES:

Early Bird Registration Deadline: 20 August 2010

- **SPE MEMBER: RM 7,755.00 (US\$2,350.00)/person**
- **NONMEMBER: RM 8,085.00 (US\$2,450.00)/person**

Registration Deadline: 13 September 2010

- **SPE MEMBER: RM 8,085.00 (US\$2,450.00)/person**
- **NONMEMBER: RM 8,415.00 (US\$2,550.00)/person**

Fee includes the following:

- Three-day registration fee for all Workshop sessions;
- Four nights accommodation based on single occupancy with arrival Sunday, 26 September 2010 and departure Thursday, 30 September 2010
- Welcome reception followed by dinner (Sunday Evening);
- Three meals per day except on Tuesday
- Daily coffee/tea breaks;
- Workshop Workbook and Certificate of Continuing Education Unit (CEU);

Note: Registration fee does not include hotel accommodation and meal costs for additional family member(s).

Registration Policy:

- Registration fee **MUST** be paid in advance for attending the Applied Technology Workshop.
- Full Fixed fee is charged regardless of the length of time that the registrant attends the Workshop.
- Fixed fee cannot be prorated or reduced for anyone (Workshop chairpersons, committee members, speakers, discussion leaders, students and registrants).
- Attendees are expected to attend all Workshop sessions and are not permitted to attend on a partial basis.

Cancellation & Refund Policy:

- A processing fee of **RM500.00 (US\$150.00)** will be charged for cancellation received before the registration deadline **13 September 2010**.
- For cancellation received after the registration deadline **13 September 2010**, a 25% refund will be made to the registrant.
- No refund on cancellation received seven (7) working days prior to the starting of the Workshop date, on or after **20 September 2010**.
- Substitutions will not be accepted without prior Programme Committee approval.
- **No refund** will be issued, if a registrant fails to show up at the Workshop on-site.

**ATTENTION NON-MEMBERS:
JOIN SPE DURING THIS WORKSHOP AND RECEIVE
YOUR FIRST YEAR'S MEMBERSHIP FREE!
SUBMIT YOUR MEMBERSHIP APPLICATION ONSITE!**

