PROCEEDINGS
OF
THE 14TH OFFSHORE SYMPOSIUM

LNG:
FROM SOURCE TO MARKET

HOUSTON, TEXAS – NOVEMBER 10, 2004

sponsored by the
TEXAS SECTION OF
THE SOCIETY OF
NAVAL ARCHITECTS AND MARINE ENGINEERS

in conjunction with
THE SOCIETY OF
INTERNATIONAL GAS TANKER AND
TERMINAL OPERATORS
TABLE OF CONTENTS

OPENING SESSION PAPERS .................................................. OPEN-1

GLOBAL LNG MARKETS: AN OVERVIEW ........................................ OPEN-3
Jonathan Cook, Excelerate Energy, Houston, Texas

COMPARATIVE STUDY BETWEEN TRADITIONAL OCEAN SHIPPING AND THE OCEAN TRANSPORT OF LNG & OFFSHORE LNG TERMINALS IN U.S. WATERS .......... OPEN-9
William P. Glenn, Jr. (AM), Royston, Rayzor, Vickery & Williams, L.L.P, Galveston, TX

SESSION A PAPERS SHIP DESIGN AND OPERATION .................. A-1

THE NEXT GENERATION LNG TANK CONTAINMENT SYSTEM AND LNG CARRIER DESIGNS .................................................. A-3
Kjell Faafeng, Inocean AS, Oslo, Norway
Thor Karlsen, Ocean LNG Inc., Houston, TX

THE TERRORIST THREAT TO LNG ................................................. A-9
Gordon Milne, Lloyd's Register EMEA, London, UK

GLOBAL AND LOCAL LOADS IN DESIGN OF LARGE LNG SHIPS .......... A-17
Rong Zhao, Olav Rognebakke, MARINTEK, Trondheim, Norway
Xing Zheng, Lloyd's Register, London, UK

SLOSHING IMPACT LOAD AND STRENGTH ASSESSMENT OF MEMBRANE-TYPE LNG CONTAINMENT SYSTEM IN LARGE LNG CARRIERS .......... A-33
J W Kim, H Lee, Y Shin, American Bureau of Shipping, Houston, TX

SESSION B PAPERS TERMINAL DESIGN AND OPERATION ............ B-1

CONCRETE GRAVITY BASED OFFSHORE LNG TERMINALS – A TREND OF TECHNICAL SOLUTION ........................................ B-3
Dajiu Jiang, Indra Datta, Helge Roraas, Aker Kvaerner, Houston, TX

OFFSHORE LNG TERMINALS – THE NEXT STEP .......................... B-13
Max Krekel (M), Richard Leeuwenburgh, Bluewater Offshore Production Systems (USA), Inc., Houston, TX
Henk van der Burg, Bart Steuten, Bluewater Energy Services BV, Hoofddorp, The Netherlands

AN INNOVATIVE FLOATING LNG VESSEL ................................ B-23
Raymond Fales, Chih-Kang Craig Lee, Fredrik Savio, ABB Lummus Global – Floating Production Systems, Houston, TX

HYDRODYNAMIC ASPECTS OF OFFSHORE LNG PRODUCTION, OFFLOADING AND IMPORT ................................................. B-37
Jaap J de Wilde, Bas Buchner, MARIN, Wageningen, The Netherlands

F(S)RU – NEW FLOATING RE-GASIFICATION UNIT FOR LNG IMPORT .............................................. B-53
Yong Luo, Mark Hollaar, Wei Ye, Jack Pollack, SBM Imodco, Inc., Houston, TX
Leon Harland, Wim Van Wijngaarden, SBM Inc., Monaco
LUNCH SESSION PAPER................................................................. LUNCH-1

MANNING AND OPERATIONAL STANDARDS IN LNG SHIPPING............................................. LUNCH-3
James A. MacHardy, Society of International Gas Tanker and Terminal Operators Ltd.,
London, England

SESSION C PAPERS SHIP POWERING................................................................. C-1

VIBRATION EXCITATION FROM SLOW SPEED LARGE BORE DIESEL ENGINES IN
LNG CARRIERS: CONSEQUENCES FOR CONTAINMENT SYSTEMS........................................... C-3
Hans Anders Smogeli, Det Norske Veritas, Oslo, Norway

ECONOMIC AND RELIABLE -- GAS TURBINE POWER FOR LNG CARRIERS............................. C-17
Roger W. Tooke, Rolls-Royce plc, Bristol, UK

GAZ DE FRANCE ENERGY -- THE FIRST LNG CARRIER OF A NEW GENERATION...................... C-27
Barend Thijssen, Wärtsilä Ship Power Solutions, Raisio, Finland

LNG CARRIERS WITH LOW SPEED DIESEL PROPULSION...................................................... C-37
Ole Groene, MAN B&W Diesel A/S, Copenhagen, Denmark

SESSION D PAPERS RISK, SAFETY, AND SECURITY............................................................... D-1

OPERATIONAL FRAME WORK AND SAFETY STUDIES FOR LNG OPERATIONS............................. D-3
Jesus Losada Maseda, REGANOSA, Mugardos, Spain
J. van Doorn, MARIN, Wageningen, The Netherlands

ENABLING TECHNOLOGIES FOR MOORING, UNLOADING, REGASIFICATION AND
STORAGE FOR OFFSHORE LNG RECEIVING TERMINALS................................................ D-15
James F. Davis, P.E., Paragon Engineering Services, Inc., Houston, TX

PRACTICAL DESIGN CONSIDERATIONS AND RISK ASSESSMENT METHODS FOR
LNG SYSTEM.................................................................................. D-29
Libang Zhang (M), ABB Lummus Global Inc., Houston, TX

RESPONSE OF AN OFFSHORE PLATFORM LEG TO TERRORIST ATTACK.................................... D-37
Jim Wesevich, P.E., S.E., Ray Bennett, P.E., Ph.D., Wenqing Hu, Ph.D., Baker Engineering
and Risk Consultants, Inc., San Antonio, TX

CLOSING SESSION PAPERS............................................................................................................. CLOSE-1

DESIGN, ANALYSIS AND OPTIMIZATION OF LNG LOGISTICS USING SIMULATION
PROGRAMS....................................................................................... CLOSE-3
Melissa Hertel, Jensen Maritime Consultants, Inc., Seattle, WA
Kevin Kinports, Seven Seas Consulting, LLC., Annandale, VA

DEMAND FOR NATURAL GAS: THE ROLE CLASS PLAYS IN LNG TRANSPORTATION...... CLOSE-15
William J. Sember, American Bureau of Shipping, Houston, TX

PROGRAM SPONSORS AND ADVERTISERS.................................................................................. SPONSORS-1