RINA

Royal Institution of Naval Architects

International Conference

MARINE HEAVY TRANSPORT & LIFT II

27-28 FEBRUARY 2008

RINA HQ, LONDON

Day 1

09.00 - 09.30 **Coffee & Registration**

09.30 - 10.05 **New Construction Rules for Semi-Submersible Heavy Lift Vessels from DNV**
H. Larsèn and M. Wiese, DNV, Norway.

During the last couple of years, the heavy lift industry has seen a major surge in activity and many new vessels have been constructed and existing vessels have been converted. DNV has been involved in many of these projects and gained valuable experience. As these vessels are very specialized, several design criteria and operational issues fall outside the basis for normal class rules. As of today no class society to our knowledge have specific construction rules covering this vessel type. During the recent surge in activity, DNV has collected their experiences within all disciplines related to this vessel type and are now in the process of issuing class rules for the construction and operation of these vessels.

10.05 - 10.40 **World's Largest Single Hull Single Mast Crane Vessel - Market research Driving Technical Challenges.**
R. W. Rietveldt, Sea of Solutions BV.
H. Weterings, Huisman-Itrec BV.

Market research revealed the need for future demand on modern heavy lift crane vessels as no new tonnage had been build over the past decades. A gap in lifting capacity was determined between existing large semi-submersible crane vessels and smaller single hull vessels/ barges. A 5,000 ton crane vessel fits perfectly with the future demand and would be a welcome addition to the existing fleet. Sea of Solutions and Huisman-Itrec will discuss the technical design challenges that had to be met when designing the Borealis vessel, now ordered for construction by Nordic Heavy Lift.

10.40 - 11.15 **Deflection and Strength as Design Aspects of Heavy Lift Multi-Purpose Ships.**
E. Egge, J. Kallies and J. Wollert, Germanischer Lloyd, Germany.

Heavy Lift Crane Capacities installed on Multi-Purpose Dry Cargo Ships are an increasingly growing market segment. In combination with extreme long and wide cargo holds ships with complex and flexible cargo handling and stowage functions require an intensive investigation in particular of deflection, strength and fatigue aspects. Beside the key tasks of classification societies to ensure safe and reliable steel structures the deflection behaviour of hull structure and its interaction with hatch cover systems is an essential issue to grant the overall functionality under harbour and seagoing condition as well as of crane operation. One essential focus of this paper will present the Germanischer Lloyd contributions to an overall design approach considering deflections and interaction forces in view of hatch cover systems on the one hand and strength and long-term fatigue aspects in view of stress concentration and periodical deformation on the other.

11.15 - 11.45 **Coffee**

11.45 - 12.20 **Developing Trans-Ocean Tow Criteria Using SafeTrans**
A. Aalbers, Marin
C. Cooper, Chevron
C. Leenaars, Leenaars BV
S. Quinn, UK. Ministry of Defence
S. Scholten, Jumbo Shipping
H. Van Zutphen, Shell
J. Vavasour, M. Daniel and R. Verwey, BigLift Shipping BV.

SafeTrans is a recently developed software package that is capable of calculating loads imposed by winds, waves, and currents during transit of a cargo on a barge, heavy lift vessel, or as a "wet body". Because SafeTrans was developed by a consortium of 32 companies, it includes input and validation from most of the major players in the tow and heavy lift industry. Unlike other existing tools, SafeTrans incorporates all the major factors including weather routing, complicated vessel response, modern forecast wind and wave databases, and risks from human error, mechanical failures, etc. This paper provides a brief description of SafeTrans, and gives several examples of applying SafeTrans to real-world problems.

12.20 - 12.55 **Float-over Installation in West Africa**
D. Honig and M. Rozeboom, Heerema Marine Contractors, The Netherlands.

In October 2007, HMC successfully preformed the float-over of the East Area Gas GX deck in Nigeria. The topsides weight was 11,000 tonnes and was transported on the Heavy Transport Vessel "Transshelf" from Korea to West Africa. This paper will give an overview of the float-over operation and will focus on the role of the installation contractor. Over 80 people, three tugs and an accommodation support vessel had to be mobilised to manage the float-over operation. The float-over crew had to operate in difficult conditions ranging from operating a variety of float-over equipment to working in Nigerian waters alongside an operational platform. Besides operational and logistic aspects, the involvement of the installation contractor in the platform design and the engineering for the installation will be discussed.

12.55 - 13.55 **Lunch**

13.55 - 14.30 **Performing Floatover Operations on DP – The Future.**
M. Beerendon, R. Palmer, G. Blower and N. Groves, Noble Denton, UK.

Floatover operations are becoming more common. The main benefits of a floatover operation are the relatively low costs involved when compared to the use of a crane vessel and the ability to install platforms utilising a single transportation and installation vessel. Float-over operations (especially those when a long transport is involved from the topside fabrication yard to the installation site) are more frequently being performed by means of self-propelled heavy lift vessels instead of barges. So far three floatover operations have been performed using a semi-submersible heavylift vessel, equipped with a Class II DP system. This paper describes the differences in operation between a mooring assisted float-over operation versus a floatover using a DP system. Case studies will be presented explaining the various steps of a typical floatover operation using a vessel on DP, while also operational issues will be addressed that will highlight the advantages of a DP floatover such as shorter required weather windows.

14.30 - 15.05 **Transport & Installation of 2 APL STL Buoys with a DP2 Heavy Lift Vessel.**
R.L. Krabbendam, Kahn Offshore B.V, the Netherlands.

The paper describes in detail the method designed by Jumbo for the installation of two APL STL buoys for the Northeast Gateway Energy Bridge, off Boston. The transportation and installation of both buoys was carried out by Jumbo's heavy lift vessel Jumbo Javelin in July-August 2007. In using a new method for installation of Submerged Turret Loading Buoys, Jumbo demonstrated that transportation and installation of such a complex mooring system can be efficiently and safely carried out using the DP2 class heavy lift vessel. This complex project was successfully completed in 30 days. The transport and installation process will be presented in detail, as well as the lessons learned and specific features of the new method.

15.05 - 15.40 **Petrobras P54 FPSO Flare Boom Installation**
L. Ming, Morlinc Pte Ltd, Singapore.

The Flare Boom weighs 580 metric tons with a total height 93 meters from main deck at 68 degrees angle to horizontal, which is one of the largest and heaviest flare booms on FPSOs. It had been successfully installed in August, 2007 by a 2050 MT floating sheerleg crane named 'Kaisei', in Maua-Jurong Shipyard located at Rio de Janeiro, Brazil. The paper will describe the three major stages involved in the installation.

15.40 - 16.10 **Coffee**

16.10 - 16.45 **Subsea Heavy Lifting: Vigdis and Tordis Project Highlights.**
C. Lloyd, Saipem UK Ltd, UK.

Vigdis Extension 2 is an oil field located South - South West of the Snorre, A platform in the Norwegian Sector of the North Sea. The water depth was 285m. In 2005 a new oil well and water injection well had been identified which Statoil intended to develop with a 4 slot production/water injection template. The template would be tied into the existing Vigdis Extension satellite templates with pipelines and umbilicals. The following year, Saipem installed a similar template in the Tordis field. This template was to be the world's first Subsea Separation, Boosting and Injection module, weighing 1295 tonnes and expected to be able to increase oil production in the field by 5%. This paper contains some of the general details of the two projects, and explores the lessons learnt.

16.45 - 17.20 **DISH and FRDS - Assisting the Industry to Deploy Subsea Hardware in Ultra-Deep Water.**
R.G. Standing and G.E. Jackson, BMT Fluid Mechanics Limited, UK
N. Charles, BMT Marine Projects Limited, UK
G. Trowbridge, OTM Consulting Limited, UK.
R.O. Snell, BP, UK

This paper outlines the aims, work scope and findings of the Deepwater Installation of Subsea Hardware (DISH) JIP and its successor project, the Fibre Rope Deployment System (FRDS) JIP. A review of industry capabilities during DISH Phase 1 showed that the self-weight of the steel wire rope used in a conventional lowering system would make it inefficient for water depths exceeding 2,000m, and impractical on most installation vessels. Lowering hardware on drill-strings from large semi-submersible drilling rigs may be practical, but is inefficient and expensive, and ties up scarce resources. The main focus of DISH Phases 2 and 3 was therefore to develop engineering data and knowledge to enable a synthetic fibre rope deployment system to be used on a conventional offshore construction vessel.

17.20 - **General Discussion & Evening Drinks Reception.**

Day 2

09.30 - 10.05 **An Accurate and Efficient Hydrodynamic Analysis Method for Offshore Discharge Operations.**
J.B. de Jonge and R.H.M. Huijsmans, Delft University of Technology, The Netherlands.
O.A.J. Peters, Dockwise Shipping B.V, The Netherlands.

Submersible heavy lift transport vessels are used for the transport of floating cargo. Normally, discharge of such cargo is done in sheltered and/or very benign areas, which are often not the areas of operation for these cargos. To be able to discharge in less benign areas, an R&D project was initiated to capture the problems arising at hydrodynamic interaction between two floating bodies in very close proximity. Comparison of model tests with industry standard 3D-diffraction analysis has shown large discrepancies. Therefore, first stage of this R&D project was to investigate the effect of the narrow gap between the loading deck and the bottom of the floating cargo, find a better analysis solution and incorporate this in a multi-body hydrodynamic interaction method. To be able to develop this method, first the single body problem in extremely shallow water is investigated.

10.05 - 10.40 **Application of CFD for Marine Heavy Transport and Lifting Projects.**
Z. Ayaz and C. Dunlop SAIPEM UK Ltd, UK.

As the operations in offshore heavy lifting and transportation are moving into uncharted territory in terms of exceeding current lifting weight limits and challenging operational areas in parallel to the trends and demands in oil & gas industry, the need to improve current analysis tools are ever more urgent. This paper presents CFD analyses for semi-submersible crane vessel and newly designed ploughing support and offshore construction vessels in the SAIPEM fleet. The detailed solid models of the vessels have been generated and the numerical results produced for wind and current induced loads have been validated against the model tests results and the Boundary element Methods analysis results. The application of CFD on the estimation of current and wind induced towing loads, squat effects on the transportation barges, and propeller-induced loads on the seabed and control devices during DP operations have been presented. Finally, the assessment of using CFD tools on the offshore lifting and transportation operations based on the above applications are presented.

10.40 - 11.15 **Validating The Motions Response Calculations of Heavy Transport Vessels.**
A. J. Bos, HMC, The Netherlands.

Motion responses especially roll, is often over estimated as damping is under estimated; recent studies presented during OTC 2008 confirmed this. In performance of the SafePlan project presented by us during the RINA conference in 2005, motions will be validated using the data from measurements on board the Fjord. Results of the measurements and comparison with the calculations will be addressed.

11.15 - 11.45 **Coffee**

11.45 - 12.20 **Real-Time Motion Monitoring: "Decision Support" And "Fatigue Consumption".**
A. Lenting, Siri Marine BV, The Netherlands.

The Heavy Transport industry sees more, larger, complex, expensive and delicate structures being transported over sea. During the transport engineering phase hydrodynamic motion response analysis, often combined with model tank tests, are carried out which result in the definition of limiting sea-states, weather routing and sea fastening designs. During the actual transport the vessel's master and/or Client representative are guided in their decision making process by a.o. maximum allowable sea-states (Significant wave heights). However the modelled motions and modelled waves are often different from real motions and waves. Real-time motion monitoring will assist the master to take the right decision at the right time and avoid maximum allowable motions (read ACCELERATIONS, roll/pitch angles and periods) from being reached. Real-time monitoring will also provide the Client with actual data about the transport, which can be used for post-processing and reporting purposes.

12.20 - 12.55 **Risk Management with Real Options in Heavy Lift Shipping Projects.**
S. Pardo and A. Molano, University of Nantes, France.

The decision of invest under uncertainty is always a sensitive subject, even more in the oil offshore projects where the period between discovery and first production could take more than five years. Nowadays the trend of the international oil prices shows good scenery for new E&P projects, specially the deep water ones because the huge investment required is now easily repaid for by the high oil prices. The main question now is how long this is going to last? As all the offshore service sectors, the transport; particularly the heavy lift shipping has benefited from the margins of the oil majors due to the boom of the high prices. The paper will analyse the investment decision in one of these sectors; the float-over barges, taking into account its dependency to the utilisation rate of the rigs which is directly reflected in its participation in the oil service value chain at the installation and/or abandonment of the rigs.

12.55 - 13.55 **Lunch**

13.55 - 14.30 **Bulky Sea Transport Based on Ship Response Weather Routing.**
H. Rathje, Germanischer Lloyd, Germany.
H-J Bäker, Schiffahrtskontor Altes Land GmbH & Co, Germany.

The sea transport from Fremantle in Australia to the Pohokura gas field nearby Port Taranaki in New Zealand in February 2006 of a bulky jacket is described. Because the jacket had to be positioned upright in the open midship hold of the multi-purpose ship Annegret, the flag state required an Interim International Load Line Exemption Certificate (IILLEC). As basis for rational operating decisions during the voyage, vertical relative motions served as criterion whether green water inflow to the jacket carrying hold was likely to occur. Transfer functions of the vertical relative motions were computed with GL's seakeeping program GLPANEL and statistically evaluated to yield maximum values for a limiting significant wave height of 4m in both long-crested seas and short-crested seas. The individual legs of the voyage were planned by continuously processing collected weather forecasts to ensure adherence to the limitations laid down in the IILLEC.

14.30 - 15.05 **Response Based Weather-Routing and Operation Planning of Heavy Transport Vessels.**
L. J. M. Adegeest, Amarcon, The Netherlands.

In recent years, various ship operators have gained experience with much more advanced response-based routing and operation planning. Using the dynamic characteristics of the vessel with cargo in combination with weather forecasts and design limits for accelerations, motions, or derived responses like leg-bending moments, onboard advice can be given regarding safe heading, speed and route. By using normalised responses, weather windows can be generated in which all the critical elements are accounted for. Since this information is provided onboard in a mariner's style, those systems have become a proven support to the crew and warranty surveyors when in heavy conditions. Operators like Dockwise, OHT, Biglift, Jumbo Shipping and others are applying this technology onboard their vessels. This paper will discuss the components of such a system and how this technology can be implemented in a heavy lift shipping organisation during the phases of engineering, at sea and in post-voyage analysis. User experience will be documented extensively.

15.05 - **General Discussion.**

International Conference

MARINE HEAVY TRANSPORT & LIFT II

27-28 FEBRUARY 2008

RINA HQ, LONDON.

To register, simply complete all sections of this form and return it with your payment to:

The Conference Department, RINA, 10 Upper Belgrave Street, London, SW1X 8BQ.
TEL: +44 (0)20 7201 2401
FAX: +44 (0)20 7259 5912
E-MAIL: conference@rina.org.uk

TITLE (Dr, Mr, Eur Ing):

NAME (as it should appear on name badge):

POSITION:

COMPANY (as it should appear on name badge):

INVOICE ADDRESS:

POSTCODE:
COUNTRY:
TELEPHONE:
FAX:
E-MAIL:

CONTACT MAILING ADDRESS (if different)**:**

POSTCODE:
COUNTRY:
TELEPHONE:
FAX:
E-MAIL:

PLEASE INDICATE YOUR PREFERRED METHOD OF PAYMENT:

I enclose a cheque for: £
(made payable to RINA)

Please send me an invoice for : £

Bank Transfer details enclosed for: £

Please debit my credit card by: £

Card Number: (Visa/Amex/Mastercard)

Expiry Date: **Signature:**

REGISTRATION FEE (Inc VAT*)	By 25/01/2008	After 25/01/2008
RINA MEMBERS:	£610	£710
NON-MEMBERS:	£710	£810
CONCESSIONS: *(Retired/Students etc.)*	£270	£270
PRINCIPAL AUTHOR	£70	£70
ADDITIONAL AUTHOR	£610	£610

The registration fee includes printed conference papers, lunch, refreshments, reception, and VAT

CONFERENCE PAPERS
Conference papers will also be for sale after the event in both print and CD ROM versions. The CD ROM will also include presentations from the conference where available. If you would like to order copies, please fill in the relevant sections.

I am unable to attend the conference, please reserve me _______ set(s) of Conference proceedings

Papers @ **£100** (members) ☐ **£120** (non-members) ☐

CD ROM **£100** (members) ☐ **£120** (non-members) ☐

For a full list of the Institution's Conference papers, CD-ROM's and other technical publications please contact Melissa Mays, Marketing Assistant on +44 (0)20 7235 4622 or via e-mail at: publications@rina.org.uk

PAYMENTS
Payment must be made in pounds sterling by Eurocheque, cheque drawn on a bank with a UK branch address, credit card (VISA/Amex/Mastercard) or bank transfer. Please note RINA requires payment before the conference date.
Account Name: The Royal Institution of Naval Architects;
Account Number: 10042127; **Account Code:** 160016
Bank Address: Royal Bank of Scotland PLC, Belgravia Branch, 24 Grosvenor Place, London, SW1X 7HP, UK.
IBAN No: GB14RBOS16001610042127
SWIFT No: RBOSGB2L

*VAT: Under UK Customs and Excise regulations delegates from all countries are required to pay VAT on any course taking place in the UK. Delegates from outside the UK may be entitled to reclaim this cost.

VENUE
RINA HQ, 10 Upper Belgrave Street, London, SWIX 8BQ.

EVENING DRINKS RECEPTION
Following the end of day one (27th February), delegates are invited to attend an evening reception at the conference venue.

ACCOMMODATION
Upon registration you will be provided with details of a hotel booking service offering reduced rate accommodation for conference participants.

CONTINUING PROFESSIONAL DEVELOPMENT
RINA Certificates of Attendance will be issued at the event, which contributes towards the Institution's Continuing Professional Development Scheme. For further details regarding the scheme please contact Giuseppe Gigantesco, Director, Professional Affairs on Tel: +44 (0)20 7235 4622 or e-mail: membership@rina.org.uk

STUDENT SPONSORSHIP
A number of sponsored places at this conference are available for Student Members of RINA. For more information, please contact Sarah Payne, Professional Affairs, RINA on Tel: +44 (0)20 7235 4622 or e-mail:spayne@rina.org.uk.

PROMOTIONAL OPPORTUNITIES
Why not use this conference to promote your company's products and services. It provides an excellent opportunity to increase your profile and to network with a highly focused audience. We offer a number of cost effective options, including various conference sponsorship packages, exhibition space and literature distribution. If you are interested in any of these promotional opportunities please contact the Conference Organiser to discuss your individual requirements.

CANCELLATION CHARGES
The following charges will be made in the event of cancellation: £100 if received by 08/02/2008 and £200 thereafter. Cancellations received within 24 hours of the event, or in the case of non-attendance will not be refunded. Delegates may be substituted; this must be sent in writing and confirmed with the Conference Organiser. In the event of cancellation of the conference for any reason, RINA's liability is limited to the return of the registration fee only.

DATA PROTECTION
Personal data is gathered in accordance with the Data Protection Act 1998. Your details may be passed to other companies who wish to communicate with you offers related to your business activities. Please tick the box below where appropriate:

☐ Please do not pass my information to any third party.

☐ I wish to receive email notification of future RINA events or publications

If you have any questions regarding this or any other RINA event please contact, the Conference Organiser, on:

Tel: +44 (0)20 7201 2401
Fax: +44 (0)20 7259 5912
E-Mail: conference@rina.org.uk
www.rina.org.uk/events