# **Technology Review 2014**

Kep

CAN-DO

CAN-DO

(eppel

MCI (P) 026/03/2014

Keppel Offshore & Marine Technology Centre 2

# CONTENTS

### About KOMTECH

- 1 CEO's Message
- 6 Managing Director's Message

### Offshore

9 Recent Advancement in Tendon Technology for Deepwater Application This paper present the literature review on the recent advancement in tendon technology for deepwater application, where the challenges and alternative tendon designs/ configurations in deepwater are addressed. The suppression devices used for mitigating the vortex induce vibration on tendon are also reviewed.

#### 19 **Review of Riser Techniques for Deepwater Application** An overview of recent developments of riser technology for deepwater applications.

#### 29 Mud System for a Deepwater Drilling Vessel A complete set of features and factors to be taken into consideration when we designing a mud system for the future deepwater drilling rig.

### Marine

Small Scale LNG Transportation in Shallow Water Regions 43 The paper describes the design features of KOMtech's LNG transport solutions for shallow water regions and the differentiator of these solutions compared with the other conventional modes. 49 Design of Moored Floating Systems Through the WS/BS Method The first time the WS/BS method is applied numerically in a systematic way on the dynamic analysis of moored floating systems. The result shows the WS/BS method as a useful tool in current design practices. 59 Ballast Water Management Plan and Treatment Solutions This paper assists the decision makers in the industry in selecting an appropriate ballast water treatment system and a retrofit partner. Development of Dynamic Positioning Simulation in ANSYS AQWA 67 A paper that describes how the dynamic positioning simulation is developed in ANSYS AQWA and its performance.

4

### Environmental/Renewables

#### 77 Reducing the Cost of Offshore Wind Structures

A paper exploring how can mass-produced steel tubulars significantly reduce the cost of offshore wind energy, and what the challenges are along the way.

## 87 Marine Selective Catalytic Reduction (SCR) Technology to Meet IMO NO<sub>x</sub> Emission Standard

A detailed study on NO<sub>x</sub> removal technologies used in marine applications and the related IMO regulations with a focus on the Selective Catalytic Reduction (SCR) technology and its process related issues.

#### 101 Short-Circuit Current Analysis for Integration of Renewable Energy Sources

This study details short-circuit current analysis for integrating renewable energy sources into an existing power system. The analysis quantities the magnitude of fault current, which is then used by designers to specify switch gear adequate for fault clearance.

#### 111 Designing with Flows: Energy-Efficient Offshore Accommodations

The first step towards energy-efficient offshore accommodations: an assessment of the application of off-the-shelf energy-saving and -harvesting technologies already proven in on-shore buildings.

### Liquefied Natural Gas (LNG)

#### 125 Technical Challenges in Offshore Gas Processing under Motion Conditions

A detailed study of solvent based absorption technologies used in offshore gas treatment processing and the designs incorporated to overcome issues that exist at sea conditions.

#### 133 Effect of Feed Gas Pressure and Ambient Temperature on LNG Production

This paper presents how the two mentioned factors influence LNG train capacity and specific power consumption. It enables sound recommendation and optimization of train capacity and energy efficiency within the process boundary conditions.

### Others

| 141 | Innovation Portfolio Framework: A Literature Review<br>This paper gives an overview of the framework for sustaining and disruptive innovations.  |
|-----|--|
| 151 | Evaluation on the Effect of Fabrication Tolerances on<br>the Fatigue Performance of Critical Connections between<br>Hull Structure and Topsides in Drillship<br>In this paper, the available data on fabrication tolerances is reviewed. The impacts of<br>various tolerances on the fatigue life of topside-hull interface structure are evaluated<br>and the techniques to improve fatigue performances are recommended. |
| 159 | Challenges of Deepsea Seabed Nodule Harvesting:<br>A Literature Review<br>A summary of the potential and the obstacles involved in Seabed Nodule Harvesting<br>- technically, environmentally, economically and politically.   |
| 171 | <b>CFD Application to Design Optimization in Ultra-Deepwater Drillship</b><br>How CFD simulation plays an important role at an early design stage in design optimization<br>of an ultra-deepwater drillship to avoid excessive resistance and moonpool oscillations.   |

Contents 5