

## Keppel and NUS to set up Corporate Lab to develop technological solutions for offshore industry

- *Deeper collaboration between industry and academia to offer innovative solutions for oil and gas exploration and production in ultra-deep water and Arctic environments*
- *Opening up new business opportunities for Singapore and Keppel to explore and exploit rich mineral resources in oceans*
- *Enhancing productivity and safety in yard activities through knowledge discovery and technology development*

Singapore, Monday, 25 November 2013 – Keppel Corporation (Keppel) and the National University of Singapore (NUS) today announced the setting up of the Keppel-NUS Corporate Laboratory, in collaboration with the National Research Foundation (NRF), Prime Minister's Office, Singapore. The laboratory, which will be based at the NUS Faculty of Engineering, will be established with an investment amount of S\$75 million.

The launch of the Keppel-NUS Corporate Laboratory was graced by Deputy Prime Minister of Singapore, Mr Teo Chee Hean, who is also Chairman of NRF.

The Keppel-NUS Corporate Laboratory is the second laboratory to be established under the NRF's Corp Lab @ University scheme, which is established to support Singapore's autonomous universities in their conduct of industry-relevant research with companies as partners.

Keppel, which has been working closely with NUS Engineering for more than 10 years in the field of offshore engineering, is the first local company to establish a laboratory of this scale, in collaboration with a Singapore university. The move signifies a deeper collaboration between the industry and academia. In the long term, the Corporate Laboratory aims to nurture engineering students for the offshore industry, providing opportunities for talented and motivated students to get hands-on experience with valuable exposure to the practical needs of the offshore industry.

The Keppel-NUS Corporate Laboratory will create a synergistic industry-university partnership to pursue three main research thrusts which are centred on Future Systems, Future Yards and Future Resources to meet the future challenges of the offshore industry. Its vision is to be a global technology centre of excellence in the pursuit of resources in a safe and responsible manner from harsh environments and ocean beds, preserving and sustaining our environment. Its mission is to undertake R&D through

Keppel's core competencies and NUS' research expertise for solutions to Deepwater, Arctic and other fields.

Leveraging on the expertise of NUS research centres such as the NUS Centre for Offshore Research & Engineering (CORE) and NUS Tropical Marine Science Institute (TMSI), as well as Keppel's research unit Keppel Offshore & Marine Technology Centre, the Corporate Laboratory will develop capabilities and technologies to maintain Singapore's position as a global leader in the offshore and marine industry.

Professor Low Teck Seng, Chief Executive of NRF, said: "This collaboration is an inflexion point because it is the first time a local MNC is investing a substantial amount of money to engage a university in both the breadth and depth of research. This corporate laboratory will capitalise on Keppel's expertise in the offshore and marine industry, as well as the research and technological capabilities that our universities have built over many years. The Corp Lab @ University scheme is a proactive approach to catalyse the translation of research into accrued benefits for Singapore."

Professor Chan Eng Soon, Co-Chairman of Keppel-NUS Corporate Laboratory and Dean, Faculty of Engineering at NUS, said, "The establishment of the Keppel-NUS Corporate Laboratory will provide a unique platform to build synergy between industry and academia. It will certainly create a culture for thinking out of the box in addressing real world problems. As it is imperative that we leapfrog ahead in innovation and technology towards expanding Singapore's investment in the offshore industry, we need to nurture engineer leaders and experts capable of going beyond frontiers in coming out with holistic solutions for complex challenges of the future. The Keppel-NUS Corporate Laboratory will help us achieve this. I am very glad that Keppel is partnering us in this venture. I am also grateful to the National Research Foundation for its generous support."

Mr Michael Chia, Co-Chairman of Keppel-NUS Corporate Laboratory and Managing Director (Marine and Technology), Keppel Offshore & Marine, added: "Keppel's participation in this initiative is in line with our aim to leverage technology and innovation to be the Provider of Choice and Partner for Solutions to the global offshore & marine industry. We have built a global reputation for innovative offshore solutions over the years, and we firmly believe that this core competency, strengthened by the research expertise of academic institutions like NUS and supported by the Singapore Government, will help sustain our leadership position as we grow into the future."

Please refer to the [Annex](#) for details on the research thrusts of the Keppel-NUS Corporate Laboratory.

For media enquiries, please contact:

**For Keppel Corp**

Eva HO  
Deputy General Manager  
Group Corporate Communications  
Keppel Corporation Ltd  
DID: +65 6413 6424  
Email: [eva.ho@kepcorp.com](mailto:eva.ho@kepcorp.com)

**For NUS**

Fun YIP  
Deputy Director & Head, Media Relations  
Office of Corporate Relations  
National University of Singapore  
DID: +65 65161374  
Email: [fun.yip@nus.edu.sg](mailto:fun.yip@nus.edu.sg)

**For NRF**

Lim Shi Yun  
Senior Officer (Corporate Communications)  
National Research Foundation  
DID: +65 6684 2103  
Email: [lim\\_shi\\_yun@nrf.gov.sg](mailto:lim_shi_yun@nrf.gov.sg)

**About Keppel Corporation**

With a global footprint in over 30 countries, Keppel Corporation leverages its international network, resources and talents to grow its key businesses. It aims to be the Provider of Choice for Solutions to the Offshore & Marine Industries, Sustainable Environment and Urban Living, guided by its key business thrusts of Sustaining Growth, Empowering Lives and Nurturing Communities. The Keppel Group of Companies includes Keppel Offshore & Marine, Keppel Infrastructure, Keppel Telecommunications & Transportation (Keppel T&T) and Keppel Land, among others.

For more information, please visit [www.kepcorp.com](http://www.kepcorp.com)

**About National University of Singapore (NUS)**

A leading global university centred in Asia, the National University of Singapore (NUS) is Singapore's flagship university, which offers a global approach to education and research, with a focus on Asian perspectives and expertise.

NUS has 16 faculties and schools across three campuses. Its transformative education includes a broad-based curriculum underscored by multi-disciplinary courses and cross-

faculty enrichment. Over 37,000 students from 100 countries enrich the community with their diverse social and cultural perspectives.

NUS has three Research Centres of Excellence (RCE) and 23 university-level research institutes and centres. It is also a partner in Singapore's fifth RCE. NUS shares a close affiliation with 16 national-level research institutes and centres. Research activities are strategic and robust, and NUS is well-known for its research strengths in engineering, life sciences and biomedicine, social sciences and natural sciences. It also strives to create a supportive and innovative environment to promote creative enterprise within its community.

For more information, please visit [www.nus.edu.sg](http://www.nus.edu.sg)

### **National Research Foundation, Prime Minister's Office, Singapore**

The National Research Foundation (NRF), set up on 1 January 2006, is a department within the Prime Minister's Office. The NRF sets the national direction for research and development (R&D) by developing policies, plans and strategies for research, innovation and enterprise. It also funds strategic initiatives and builds up R&D capabilities by nurturing research talent. The NRF aims to transform Singapore into a vibrant R&D hub that contributes towards a knowledge-intensive, innovative and entrepreneurial economy; and make Singapore a talent magnet for scientific and innovation excellence.

For more information, please visit [www.research.gov.sg](http://www.research.gov.sg)

## **Annex: Keppel-NUS Corporate Laboratory – Research Thrusts**

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The following three major research thrusts have been identified to address future challenges of the offshore industry:

### **Future Systems**

The research thrust on Future Systems will focus on two main themes:

- **Deepwater Technology:** Addressing challenges and developing novel solutions for floating systems for deep and ultra-deep water for oil & gas exploration and production, for example, in the design of “floaters” (offshore drilling rigs that float and are also known as semisubmersibles) capable of operating longer in harsh environments, and developing core competencies in drilling riser technology.
- **Arctic Technology:** In recent years, the Arctic has become a focus of international attention because of its rich petroleum and mineral resources. Understanding ice-structure interaction is a critical factor in the design of Arctic drilling systems. Ice-interactions with non-conventional Arctic structures will be studied, among others.

Deep and ultra-deep water as well as the Arctic environments present a unique set of challenges rarely encountered in shallow water developments. In developing innovative and competitive solutions for such challenging environments, a fundamental understanding of the relevant physics, engineering principles and the impact on innovative offshore systems, is of paramount importance. The Keppel-NUS Corporate Laboratory will play a key role in such research and when the “ocean wave basin”, a facility for simulating conditions of the ocean, as well as other relevant facilities are completed they will strengthen the R&D capabilities in this area.

### **Future Yards**

Future Yards will focus on the theme of **Productivity Enhancement of Yard Operations** which will address the needs to increase productivity and reduce reliance on manual labour in three main yard activities – welding, painting, and operations in confined spaces. This will be achieved with the use of more efficient and advanced production methods, and the design and development of automated systems which could perform the current manual tasks.

The developed systems shall capture human expertise and improve productivity, quality and safety at the same time, while minimising repetitive and hazardous jobs. One example is the development of an automated welding system which could work in confined spaces.

## **Future Resources**

Rich mineral resources lay beneath the oceans which are important future resources as the supply of minerals from land begins to diminish. The research thrust on Future Resources will focus on the theme of **Deepsea Seabed Nodule Collection** to develop core competencies in environmental impact assessment and environmentally-benign exploration and exploitation of mineral resources in the deep ocean.

The Singapore Government is sponsoring the application of Ocean Mineral Singapore (OMS), a subsidiary of Keppel, to the United Nations International Seabed Authority to carry out exploration works for polymetallic nodules. These polymetallic nodules, which lie on the seabed, contain precious minerals such as manganese, cobalt, nickel and copper.