



Company Registration Number: 196300098Z

## **Sembcorp Marine, ABS and A\*STAR's Institute of High Performance Computing team up to develop new gas technologies in offshore, marine and energy sectors**

**Singapore, September 19, 2018** – With the growing relevance of Liquefied Natural Gas (LNG) as a sustainable alternative to oil and other fossil fuels, Sembcorp Marine, ABS (American Bureau of Shipping) and A\*STAR's Institute of High Performance Computing (IHPC) are teaming up to develop new technologies, applications and capabilities in the offshore, marine and energy sectors that will advance the adoption of LNG as a globally preferred fuel.

Through this collaboration, the three organisations aim to make LNG more accessible, reliable and safer for industry and domestic consumption.

This morning at Sembcorp Marine Tanjong Kling Yard, the technology partners signed a Memorandum of Understanding (MOU) on the following areas:

- **Development of Market-ready LNG Solutions**

Sembcorp Marine and ABS will work on the approval and certification of Sembcorp Marine's gas value chain solutions for small-scale LNG applications, such as LNG-battery hybrid tugs, LNG bunker vessels and LNG terminals.

To enhance these solutions further, Sembcorp Marine will tap the gas expertise and simulation capabilities of ABS and IHPC respectively.

- **LNG Technology Development**

Sembcorp Marine, ABS and IHPC will focus on offshore LNG processing, transfer and containment, and new applications of LNG as a sustainable fuel. Through various joint developmental projects, they also seek to augment the safety and reliability of LNG for offshore applications.

- **Development of LNG-related Capabilities**

The technology partners will develop and conduct training and technical workshops through the Sembcorp Marine Academy to build and hone specialised knowledge and skill sets supporting the growth of LNG technology-related businesses.

Overall, the research collaboration will see the partners leveraging one another's domain expertise, namely, Sembcorp Marine's offshore, marine and energy value chain solutions; ABS's LNG certification and experience in applying operational technology; and IHPC's expertise in high performance computing, system modelling and advanced simulation.

Speaking at the MOU signing, Sembcorp Marine President & CEO Mr Wong Weng Sun said: “While the benefits of LNG as an environmentally sustainable and affordable fuel are conclusive, we can do much more in the offshore, marine and energy sectors to advance its adoption as a preferred fuel for global consumption. I am therefore excited that Sembcorp Marine is working with ABS and IHPC to spearhead the development of new gas technologies, applications and solutions that could expedite this outcome. I am also very pleased that our Tuas Boulevard Yard will be a test-bed for the various projects identified. We certainly have a lot to look forward to in this collaboration and I wish the technology partners a resounding success.”

“As a global leader in gas, ABS is collaborating with innovative companies and organisations such as Sembcorp Marine and IHPC, to support the delivery of technologies that minimise the environmental impact of shipping,” said Mr Tony Nassif, ABS Executive Vice President and Chief Operating Officer.

Professor Tan Sze Wee, Executive Director of A\*STAR’s Science and Engineering Research Council (SERC), said: “As Singapore’s leading public sector R&D agency, A\*STAR is committed to supporting large local enterprises like Sembcorp Marine to innovate and develop new technologies and capabilities. By driving R&D that encourages the adoption of LNG as a sustainable fuel, Sembcorp Marine will continue to have a competitive advantage in the global economy. With ABS, a renowned international body, on board, this collaboration is an exciting one with the potential to transform the offshore, marine and energy sectors, both locally and abroad.”

## Notes to editors



Seated from left: Mr Thomas Tan, Vice President, Singapore & Malaysia, ABS; Mr Simon Kuik, Vice President and Head of Research & Development, Sembcorp Marine; and Dr Lim Keng Hui, Executive Director, Institute of High Performance Computing; signing the MOU. The signing was witnessed by (standing, from left): Mr Tony Nassif, Executive Vice President and Chief Operating Officer, ABS; Mr Wong Weng Sun, President & CEO, Sembcorp Marine; and Dr Hazel Khoo, Deputy Executive Director, A\*STAR’s Science and Engineering Research Council



Standing from left: Mr Wang Zijian, Head of Singapore Yard Operations, Sembcorp Marine; Mr Tony Nassif, Executive Vice President and Chief Operating Officer, ABS; Mr Wong Weng Sun, President & CEO, Sembcorp Marine; Mr Thomas Tan, Vice President Singapore & Malaysia, ABS; Mr Simon Kuik, Vice President and Head of Research & Development, Sembcorp Marine; Dr Lim Keng Hui, Executive Director, Institute of High Performance Computing; Dr Hazel Khoo, Deputy Executive Director, A\*STAR's Science and Engineering Research Council and Mr Chua San Lye, Chief Human Resource Officer, Sembcorp Marine

To download high-resolution images of the MOU signing, please click [here](#).

### **More on the Sembcorp Marine-ABS-IHPC Joint Developmental Projects**

These projects will cover four main areas:

- LNG Processing;
- LNG Transfer;
- LNG Containment; and
- Use of LNG as a Sustainable Fuel.

#### **LNG Processing**

LNG Processing typically involves liquefaction and regasification. When extracted from the field, natural gas is purified and liquefied through multiple compression and refrigeration cycles, and finally transported by large LNG tankers in a liquid state.

At the end-user – for example, a gas power plant – LNG is regasified as fuel for power generation. During the regasification process, a significant amount of cold waste energy is generated. The technology partners will explore efficient methods to recover, store and redistribute this energy for essential cooling or ventilation services.

#### **LNG Transfer**

In small-scale LNG distribution using LNG bunker vessels and near-shore LNG terminals, frequent LNG loading and offloading cause an increased generation of boil-off gas.

Boil-off gas results from heat entering LNG tanks during storage and transportation, in turn causing the product to evaporate continuously into a gas that is commonly recovered as fuel for powering the tanker vessel carrying the LNG tanks.

The technology partners will carry out a holistic study on preventing or minimising boil-off gas generation during LNG transfer operations.

## **LNG Containment**

As LNG is stored in a liquid state at -162°C, the design of LNG containment systems requires thorough structural safety considerations to prevent thermal shock damages to the containment systems' surrounding structures, piping and equipment.

The technology partners will employ multiple analyses, including heat transfer and finite element and fatigue analyses, to optimise the safe design of LNG containment systems.

## **Use of LNG as a Sustainable Fuel**

To promote LNG fuel adoption, more comprehensive safety studies will boost the confidence of end-users and regulators.

The technology partners aim to create a set of proven computational modelling and simulation approaches on gas dispersion and explosion scenarios in order to facilitate risk assessment and mitigation. These approaches will also be applicable to the design and operation of new-generation LNG-fuelled vessels and terminals.

At a later stage, the partners plan to carry out research on optimising the energy efficiency performance of Sembcorp Marine's LNG-powered ship designs, including LNG-battery hybrid tugs.

## **About Sembcorp Marine**

Sembcorp Marine provides innovative engineering solutions to the global offshore, marine and energy industries, drawing upon more than 50 years of track record. We focus on four key capabilities, namely, Rigs & Floaters; Repairs & Upgrades; Offshore Platforms; and Specialised Shipbuilding.

Our customers include major oil companies, drilling contractors, shipping companies as well as owners and operators of floating production units.

We operate shipyards and other facilities in Singapore, Indonesia, Norway, the United Kingdom, USA and Brazil.

Discover more at [www.sembmarine.com](http://www.sembmarine.com).

## **About ABS**

ABS, a leading global provider of classification and technical advisory services to the marine and offshore industries, is committed to setting standards for safety and excellence in design and construction. Focused on safe and practical application of advanced technologies and digital solutions, ABS works with industry and clients to develop accurate and cost-effective compliance, optimized performance and operational efficiency for marine and offshore assets.

For more information on ABS Global Gas solutions: [www.eagle.org/globalgas](http://www.eagle.org/globalgas)

## **About A\*STAR**

The Agency for Science, Technology and Research (A\*STAR) is Singapore's lead public sector agency that spearheads economic oriented research to advance scientific discovery and develop innovative technology. Through open innovation, we collaborate with our partners in both the public and private sectors to benefit society.

As a Science and Technology Organisation, A\*STAR bridges the gap between academia and industry. Our research creates economic growth and jobs for Singapore, and enhances lives by contributing to societal benefits such as improving outcomes in healthcare, urban living, and sustainability.

We play a key role in nurturing and developing a diversity of talent and leaders in our Agency and research entities, the wider research community and industry. A\*STAR's R&D activities span biomedical sciences and physical sciences and engineering, with research entities primarily located in Biopolis and Fusionopolis. For ongoing news, visit [www.a-star.edu.sg](http://www.a-star.edu.sg).

## **About IHPC**

A\*STAR's Institute of High Performance Computing (IHPC) was established in August 1998 to provide leadership in high performance computing as a strategic resource for scientific inquiry and industry development. It seeks to power discoveries through advanced methodologies, techniques and new tools in modelling, simulation and visualisation. Its core research areas are in the realm of complex-coupled systems, mechanics and fluid dynamics, large-scale systems, digital modelling, adaptive and collaborative computing, data mining and analysis, computational electronics and electromagnetics, computational materials science and chemistry.

For more information about IHPC, please visit <https://www.a-star.edu.sg/ihpc>

## **Media Contacts**

Annie Sng  
Manager, Corporate Communications  
Sembcorp Marine  
Tel: +65 6262 8344  
Email: [puaytian.sng@sembmarine.com](mailto:puaytian.sng@sembmarine.com)

Gareth Lewis  
Global Media Relations Manager  
ABS  
Tel: +44 (0)20 7377 4514 | Mob: +44 (0)7824 374395  
Email: [glewis@eagle.org](mailto:glewis@eagle.org)

Ms Kueh Xiu Qing  
Senior Officer, Corporate Communications  
Agency for Science, Technology and Research (A\*STAR)  
Tel: +65 6826 7654

Email: [Kueh\\_Xiu\\_Qing@hq.a-star.edu.sg](mailto:Kueh_Xiu_Qing@hq.a-star.edu.sg)