

# Competitive Strengths

*Sembcorp Marine's success is attributed to strong commitment to customer satisfaction, high quality and safety standards, integrated supply chain and continuous innovation. To sustain its leading edge, the Group continues to invest in research and development to grow its intellectual assets and proprietary capabilities for greater productivity and enhanced competitiveness.*

## Proven Track Record

Sembcorp Marine's capabilities extend from marine & offshore repair and upgrading, specialised shipbuilding, building of high-specification jack-ups, fast-track construction of ultra-deepwater semi-submersibles, conversion of floating production and storage facilities to the engineering and construction of offshore platforms. In recent years, the Group further broadened its product portfolio to include accommodation semi-submersible and well-intervention semi-submersible rig solutions.

The Group made its foray into drillship construction with the launch of its proprietary Jurong Espadon drillship design in 2011. Capable of drilling to depths of 40,000 feet, the Jurong Espadon drillship has secured a total of nine orders to-date. Seven of these drillships, ordered by Sete Brasil in 2012, will be built for operations at water depths of 10,000 feet and with accommodation for 180 people. The latest two units contracted by Transocean in February 2014 will have capabilities to operate in 12,000 feet water depth with accommodation facilities for 220 people.

Designed to meet the industry's most stringent operating requirements for deepwater drilling, the drillships are equipped with DP-3 superior motion capabilities, state-of-the-art drilling facilities, a larger deck area, efficient deck arrangement and a large moon pool for enhanced drilling efficiency and operational safety.

In the area of rig building, the Group's flagship series of Pacific Class jack-up designs have been well-received by customers around the world. The proprietary Pacific Class 400 jack-up rig design has received 17 rigs orders, including seven new units



*The proprietary Jurong Espadon drillship is designed to meet the industry's stringent requirements for deepwater drilling.*

in 2013. Eight units have been successfully delivered by the end of 2013.

The Pacific Class 400 jack-up is an extension of the Group's proven Pacific Class 375 design which has 27 jack-up orders and deliveries. Designed to operate in waters of 400 feet and drill to depths of 35,000 feet with improved drilling efficiencies and operations support, the rig represents the latest generation of high-specification jack-ups with advanced features and capabilities.

## Strong Customer Focus

Customer satisfaction has been a key success factor for the Group. Putting customers at the forefront, the yards monitor and manage the end-to-end experience for customers, ensuring a high level of engagement for smooth project completions.

While a project is ongoing, the yards conduct customer satisfaction surveys to understand any key concerns in the areas of project management, facilities, safety, engagement and quality. Senior management and Board directors are updated on the inputs received from customers. Management-level and cross-functional teams also monitor and review customer complaints closely to establish actions to address their concerns and improve customer satisfaction. The feedback received from customers during the year was generally positive.

Apart from these feedback mechanisms, the Group engages and updates customers through meetings, newsletters, conference calls, correspondences, safety walkthroughs, on-site visits as well as participation in exhibitions and



Jurong Shipyard's annual Advanced Supplier Relationship meeting with alliance partner, Chevron Shipping Company.

conferences. The yards also share information on safety matters and progress updates at their regular meetings with customer partners. During the year, senior management from Jurong Shipyard joined representatives from its Alliance Partner, Chevron Shipping Company, for a fruitful two-day Advanced Supplier Relationship meeting. The meeting allowed both parties to exchange feedback, discuss plans for the year and look ahead for ways to further strengthen cooperation.

Other forms of engagements to forge closer links with customers are through workshops, forums or events as well as informal team outings and barbeque dinners. During the year, customers were invited to a series of appreciation functions organised by Sembcorp Marine as part of its 50th anniversary celebrations, including a networking dinner in Houston, USA, a luncheon reception in Oslo, Norway and a gala dinner in Singapore.

## High Standards of Quality, Health, Safety and Environment

Sembcorp Marine demonstrates its commitment to uphold health, safety and environment (HSE) by benchmarking to globally recognised standards and best practices. The Group's operations incorporate internationally recognised HSE and quality management systems. Health and safety impacts are assessed through the life cycle of all projects – from the design to construction and operation. Each stage of a project is meticulously executed in accordance with the Group's HSE policies and procedures, customers' HSE requirements, as well as international maritime laws and regulations. When completed, all projects undergo strict quality and safety audits by certified classification societies before delivery to customers.

Sembcorp Marine's subsidiary yards have stringent quality and HSE management systems which are in compliance with international business excellence standards, such as ISO

9001, ISO 14001 and OHSAS 18001. The list of certifications can be found on page 25. To ensure conformance to the high standards required, these systems and processes are regularly reviewed through internal and external audits to improve quality and WSH performance.

## Supply Chain Synergy

With an integrated chain of suppliers providing materials, equipment, systems and manpower, the Group is able to offer global customers a full range of complex turnkey marine and offshore engineering solutions – from procurement and construction through to integration, commissioning and delivery.

Through robust supply chain management, the Group strives to continuously seek opportunities for increased productivity, cost efficiencies and delivery of innovative solutions. In addition, Sembcorp Marine actively engages its suppliers globally to gain insights into the latest technologies, processes and standards across the value chain.

The Group develops a pool of contractors screened for their commercial track records and safety performance. Suppliers are appointed only upon meeting the strict selection criteria of the Group and its customers, including being subjected to technical evaluation audits on their quality and safety standards as well as their ability to deliver on time.

Subsidiary yards work very closely with suppliers and contractors, synergising their combined strengths to provide customers with value-added and integrated customised solutions for all project phases.

## Investing in Innovation

Sembcorp Marine Technology, the Group's dedicated research & development arm, spearheads projects in the areas of environmental and energy management, efficiency as well as product and process improvements.

The Group also collaborates with tertiary and research institutions as well as industry partners to develop new generation technologies and leading-edge innovations that enhance productivity and competitiveness.

To further the cause of education and research, Sembcorp Marine has committed \$10 million over a period of five years to an endowment fund that supports the set up of the Sembcorp Marine Lab @ NTU, a new research facility at Nanyang Technological University (NTU). Housed and led by NTU's School of Mechanical & Aerospace Engineering, the facility will serve as a nucleus for new discoveries and the development of innovations with a focus on productivity enhancement solutions and innovative environmental technologies, for the marine and offshore industry's sustainable growth.

### **Environmental Technologies**

One of Sembcorp Marine's focus areas for the year was to explore initiatives for harnessing alternative energy sources at the new Sembmarine Integrated Yard @ Tuas.

To this end, it continued its collaboration with NTU to develop the Land-based Energy Management System. The new system was tested and installed successfully at the main substation of the integrated new yard in 2013. The solution makes use of a ship-shore power consumption & billing system and a power distribution performance monitoring system to generate optimised power flow, forecast power demand and manage peak demand usage.

Another system installed and tested at the new yard during the year was the wave energy converter, developed jointly with Hann-Ocean Technology. The new system, which converts wave energy to electricity, provides a renewable power source to the yard.

Other innovative projects are in various stages of development within the Group's yards. Among these include the robotic ship blasting and painting system with dust control – a project jointly developed by Jurong Shipyard, Entraco Offshore, Common Alliance and Ngee Ann Polytechnic's Engineering Marine Offshore Technology Centre of Innovation, with funding support from SPRING Singapore. This system performs grit blasting as well as airless spray painting through a state-of-the-art man-machine interface and a dust-control mechanism to improve air quality.

### **Process Improvements**

The Group also focused its research & development efforts on process innovations to reap productivity benefits and cost savings.

During the year, a valve lapping and assembly table innovation developed by Sembcorp Marine Technology was successfully tested and introduced in the integrated new yard. By substituting the use of a pneumatic drill with an electrical drill, the device increases the efficiency and safety of valve repairs during piping and outfitting operations.

Jurong SML, in collaboration with Ngee Ann Polytechnic, completed and tested a software programme to computerise the planning of ship berthing and docking at the yard. Fully implemented in 2013, the software has achieved time savings and optimised facilities usage with a focus on safety compliance at the yard. Both parties are also working jointly on another software programme for dock block planning to better serve the full range of vessels repaired.

The yard is also collaborating with the National University of Singapore to design a dock block lifter capable of shifting and repositioning dock blocks in tight corners during drydocking. In an earlier project with the university, Jurong SML's integrated telescopic gangway that allows for safer and faster ship boarding at different tidal conditions clinched the bronze Workplace Safety and Health (WSH) Innovation Award at the industry level in 2013.

### **Culture of Continuous Improvement**

Beyond specific research and development projects, the Group fosters a strong innovation culture among employees to drive continuous improvement at the workplace. Employees actively participate in staff suggestion schemes and innovation competitions which promote and reward creative problem-solving. Viable solutions, originating from staff ideas, are constantly implemented at the yards to increase workplace safety and productivity while reducing operational costs.

One such event in 2013 was the 13th Innovation Carnival which showcased more than 30 innovative exhibits developed by the Group's yards to enhance safety, efficiency and cost savings. Jurong Shipyard, Sembawang Shipyard and Jurong SML also organised innovation competitions during the year to encourage staff teams to innovate work processes for safety and productivity.

Outstanding projects from the Group which exemplified the best in workplace safety and health (WSH) were submitted for national competitions. Many of them achieved awards at the annual national WSH Awards, organised by the WSH Council, and the industry-level WSH Innovation Convention organised by the Association of Singapore Marine Industries.



*Sembcorp Marine President & CEO Mr Wong Weng Sun viewing an innovation project developed by employees.*

# Award-winning Innovations in 2013



## Auto-Rotor-Out

Winner of WSH Innovation Award,  
National WSH Award  
Developed by: Jurong Shipyard

- Minimises leakage of grit dust during tank blasting and risks of slips, trips and falls from grit-covered surfaces
- Improves productivity with fewer work disruptions required to fix leakages



## Flanges Splitter

Winner of WSH Innovation Award,  
National WSH Award  
Developed by: Jurong Shipyard

- Eliminates pinch point contact and reduces hand and finger injuries when splitting flanges for gasket insertion and removal
- Increases productivity, efficiency and safety



## C-Dile Machine

Winner of ASMI WSH Innovation Award (Gold Award)  
Developed by: Jurong Shipyard

- Enables hydraulic pistons to be disassembled with greater safety, precision and efficiency during repairs
- Reduces the need for manual handling, minimises the risk of injuries and enhances work efficiency



## T-Joint Connector

Winner of ASMI WSH Innovation Award (Gold Award)  
Developed by: Sembawang Shipyard

- Eliminates the use of two power cables for heating the quiver and the electrode holder
- Increases welding productivity



## D-Fender Holding Bar

Winner of ASMI WSH Innovation Award (Silver Award)  
Developed by: Jurong SML

- Eliminates the application of hot works in the process of removal and refit of rubber d-fenders
- Reduces the need for manual handling, minimises the risk of injuries and enhances work efficiency



## Integrated Telescopic Gangway

Winner of ASMI WSH Innovation Award (Bronze Award)  
Developed by: Jurong SML

- Improves safety by self-compensating against tide changes
- Eliminates the use of manpower to frequently monitor gangway movement