

Load-out and Mating-in-Dock technique to accelerate the semi-submersible construction process.



## COMPETITIVE EDGE & CAPABILITIES

Positioning itself for sustained growth, Sembcorp Marine forged ahead in its strategy of building strategic partnerships, leveraging innovation and strengthening capabilities to reinforce its leading presence and competitiveness. Strategic alliances formed with the Group's overseas associates and customers helped to establish win-win partnerships and mutually beneficial working relationships that reap synergistic benefits for all parties.

### Forging Strategic Partnerships

Cultivating long-term alliances with valued customers have always been an important tactical focus as they ensure a steady flow of recurring ship repair work and a stable baseload order book for the Group.

Sembcorp Marine's yards have won the confidence of globally renowned companies with their proven track records and strong technical capabilities. Companies that have committed to strategic alliance, favoured customer contract (FCC) and long-term partnerships with the Group's yards include prominent shipowners as well as oil and gas majors.

### Strategic Customer Partnerships

Company	Contract Type
BP Shipping (UK)	Alliance
BHP Billiton (Australia)	
Chevron Shipping LLC	
JO Tankers	
NOL Shipping	
Shell International Trading and Shipping Co Limited (UK)	FCC
Alaska Tanker Co (USA)	
ASP Shipmanagement Group (UK)	
BW Gas ASA	
ConocoPhillips Inc (USA)	
EMS Ship Management (ex-TESMA)	
Euronav Shipmanagement B.V. (Belgium)	
Exmar Shipmanagement B.V. (Belgium)	
Kumiai Senpaku	
Taiwan Marine Transport	
TECTO B.V. (Belgium)	
Transocean Eastern Pte Limited	
V Ships (Monaco)	
North West Shelf Shipping Service Company (Australia)	FCC / LNG longevity and refit
Nor Offshore	Docking & Maintenance
Police Coast Guard	
PSA Marine	New LST Maintenance
Republic of Singapore Navy	

### Breakthrough LNG Longevity & Refit Contracts

During the year, Sembcorp Marine was awarded a long-term longevity contract and an evergreen favoured customer contract (FCC) by International Gas Transportation Company, the parent shipping company of the North West Shelf Venture, for the life extension and repair of its fleet of Liquefied Natural Gas (LNG) vessels.

The longevity and evergreen FCC contracts, signed between IGTC's shipping advisor North West Shelf Shipping Service Company (NWSSSC) and Sembcorp Marine's subsidiary Sembawang Shipyard in September and December 2008 respectively, are the first of their kind between a major LNG operator and a Singapore shipyard group.



Marking the LNG carrier longevity contract signing with International Gas Transportation Company Limited, the parent company of North West Shelf Venture.

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The longevity contract commits both partners to co-operate in the life extension of IGTC's fleet of six Moss-Rosenberg type LNG carriers as they progressively reach their 20th year in service. The first vessel, Northwest Sanderling, is scheduled to undergo life extension and upgrading at Sembawang Shipyard in June 2009 at an estimated cost of S\$35 million.

The evergreen FCC contract will see IGTC's six Moss-Rosenberg LNG vessels and one membrane LNG carrier undergoing major refits and regular maintenance in Sembcorp Marine's Sembawang Shipyard and Jurong Shipyard from 2009.

### Strengthening FCC Partnerships

Sembawang Shipyard's good relationship with its customers was also evident from various FCC contract awards and renewals during the year.

EMS Ship Management, formerly known as TESMA, renewed its FCC contract with Sembawang Shipyard in May 2008. With the renewal of the FCC contract, which was signed back in 2002, the yard will continue to be EMS Ship Management's exclusive partner for the drydocking and repair of its fleet of owned and managed vessels.

The yard also secured two FCC contracts in October 2008 from Transocean Eastern Pte Ltd, a subsidiary of the world's largest drilling contractor Transocean Inc, and Norway's BW Gas ASA, formerly known as Bergesen Worldwide Gas.

Transocean Eastern, which controls 26 drilling units operating in Middle East and Asia, is expected to repair and upgrade two to four rigs at Sembawang Shipyard annually. The first rig under the contract, Harvey Ward, arrived the same month for repairs.



FCC contract signing with EMS Shipmanagement.



FCC contract signing with Transocean Eastern.

Under the FCC contract with BW Gas, Sembawang Shipyard will carry out repairs for all LNG and LPG carriers scheduled for docking in the area. A total of four BW Gas vessel dockings are expected in 2009.

### Enhancing Operational Capabilities

Sembcorp Marine's yards built up their capabilities with the installation of new facilities and equipment to further enhance operational effectiveness and competitiveness.

Jurong Shipyard saw the official opening of a new Project Coordination Centre by Mr Tan Kwi Kin, Sembcorp Marine's Group President & Chief Executive Officer, at the yard's Tanjong Kling location on December 22, 2008. Able to house up to 700 persons, the 4,800 m<sup>2</sup> facility serves as a strategic hub for the effective planning, coordination and execution of the various ship repair, shipbuilding, ship conversion, rig building and offshore engineering projects in the yard.

New equipment and machinery were also added to enhance the operational efficiency of the Group's yards. Jurong Shipyard saw the installation of two units of



Official opening of the Project Coordination Centre to enhance operational capabilities.



Official opening of Phase II yard development in Batam by P.T. SMOE Indonesia.

300-tonne cranes to increase its cranes capacity, the installation of three new enclosed blasting chambers and the addition of blasting equipment to complement its growing marine and offshore engineering operations.

To further boost its offshore engineering and construction capabilities, SMOE added a rigid thread cutting machine, an automated pipe spool welding machine, a band saw machine, a hydraulic puncher and a 250-tonne trawler crane to increase its production efficiency and capacity.

Beyond Singapore, Sembcorp Marine's Indonesian subsidiary P.T. SMOE further expanded its facilities to provide stronger support to the Group's home-based operations. P.T. SMOE Indonesia increased its operational capabilities to handle more than 500,000 manhours of work per month with the launch of its new Phase II yard development.

Officially opened on November 14, 2008 by Bapak Drs. H. Ismeth Abdullah, Governor of Kepulauan Riau Province, the new yard development on Batam Island features enhanced facilities. These include three large workshops each totalling 20,460 m<sup>2</sup> and measuring 110m x 62m, a new auto-blasting and painting workshop equipped with one of the largest and most sophisticated machinery in South East Asia, a reinforced 275m long quay wall that can now accommodate jackets of up to 15,000 tonnes or decks of up to 10,000

tonnes, an additional 310m skidway, and a well-equipped medical centre with its own ambulance.

In addition to equipment and facilities upgrades, the yards also enhanced their information management systems, resulting in improved information sharing and more efficient work processes. Security for information systems was also increased to protect the yards' intellectual and technological assets.

As part of efforts to benchmark against international standards, Sembcorp Marine participated in a mission trip to Japan as part of an industry delegation led by the Association of Singapore Marine Industries (ASMI). Through the visit, the Group gained a deeper understanding of the technological developments and best practices adopted by industry peers to further enhance operational performance within its yards.

### Investing in Research and Innovation

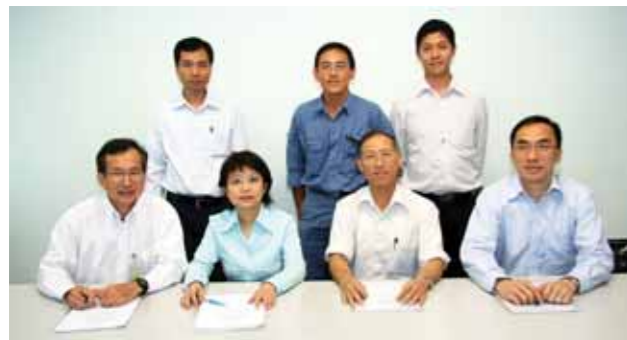
To maintain its leading edge, Sembcorp Marine invested considerable resources into the research and development of marine and offshore technology to stay at the forefront of industry developments and advancements.

Gearing up for future challenges in the offshore sector, research and development efforts continued to be channeled by Sembcorp Marine Technology towards

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the development of high-performance proprietary designs and critical components for offshore rigs and ships. Successful proprietary designs previously developed by the Group included the Pacific Class 375 deep drilling jack-up by PPL Shipyard and the Jubilee Class 2,646 TEU containership by Jurong Shipyard.

Marine technology was another focal point. In August 2008, Sembcorp Marine Technology entered into an agreement with technology partners from SPRING Singapore, Ngee Ann Polytechnic's Marine & Offshore Centre for Innovation, SIF Technologies and Memiontec to develop the region's first chemical-free ballast water treatment system.



Semcorp Marine Technology with partners from Ngee Ann Polytechnic, SPRING Singapore, SIF Technologies and Memiontec.

The project aimed to develop a system in line with new regulations from the International Maritime Organisation that required all newly built vessels to be fitted with a ballast water treatment system to minimise the risk of harmful aquatic organisms being spread by ballast water from ships.

### Turning Knowledge into Intellectual Assets

The transformation of proprietary knowledge and innovations to intellectual assets was an important focus in the Group's strategy of maintaining its competitive advantage.

To harness the full value of these intellectual assets, patents were progressively filed for the Group's proprietary production processes and workplace innovations. In 2008, patent rights were awarded to Jurong Shipyard for its breakthrough, award-winning 'Load-out and Mating-in-Dock' technique to accelerate the semi-submersible construction process. This proven technique, which enabled the simultaneous construction and subsequent integration of the rig's



Load-out and Mating-in-Dock technique.

upper and lower hulls in a drydock environment, had been successfully used by the yard to deliver two units of the fifth-generation ultra-deepwater semi-submersibles – Development Driller I and Development Driller II – in 2005.

Another highly successful patent-pending engineering innovation pioneered by Jurong Shipyard was the 'Transverse Skidding' semi-submersible construction technique, which complements the 'Load-out and Mating-in-Dock' technique for the fast-track building and sequential assembly of multiple semi-submersible rigs.

By leveraging these innovative techniques, the yard was able to optimise its capacity to build more than two semi-submersible units in a year, as proven by the successful deliveries of two sixth-generation ultra-deepwater semi-submersible units, West Sirius and West Taurus, in 2008.



Safe Stage team from Jurong Shipyard's Hull Painting Department.

### Innovating for Workplace Improvement

The Group believes in unleashing the full potential of employees' ideas for continuous workplace improvement. It actively promoted the proactive contribution of innovative solutions among employees through competitions and carnivals in which outstanding innovations were showcased and honoured. By encouraging employees to transform their ideas to practical workplace innovations, it was able to reap both tangible and intangible benefits, including cost-savings arising from productivity improvements, improved quality, safety and better employee morale.

Some notable innovations developed by employees during the year include:

- **HP Hook**

Designed to enhance safety while working at heights, the HP Hook by Jurong Shipyard's Hull Painting Department creates an extended outlet for the secure hooking of the safety harness to scallop holes. The HP Hook also doubles up as an additional anchor point for the second safety life line to prevent falling and swinging hazards. This significantly enhances safety and reduces falling hazards during scaffold work.



- **Semi-Automatic Lifting Gears (Spider Grab)**

The Semi-Automatic Lifting Gears innovation, also known as the Spider Grab, is a customised lifting device with a semi-automatic locking mechanism created by Sembawang Shipyard's Hull Department to aid the process of lifting and handling irregular shaped outfitting items. It eliminates the need to weld eye plates, thus enhancing work efficiency while minimising the safety risks and material damage associated with hotwork and grinding. The device, which can be operated from a distance, also enables workers to keep a safe distance from the lifting works.



- **Complete Sensor**

The Complete Sensor developed by Jurong Integrated Services enables the timely detection of people and objects in the path of travelling machinery such as overhead cranes, CNC plate-cutting machines, and welding gantries to prevent collision incidents. When an obstruction is detected, the system's sensing line triggers off a tactile switch which temporarily disables the machine. It also comes with an emergency switch which serves as an additional back-up for greater protection. This innovation has resulted in enhanced safety in the workshops and greater morale among employees.



- **Rudder Nut Turner**

The Rudder Nut Turner is an innovative device conceived by Sembawang Shipyard's Mechanical Department to provide a stable support platform for the refitting of the rudder nut during propulsion works. This is a more stable and secure alternative than the conventional turntable method, where workers are exposed to material-falling hazards.



The device also enables easier alignment and greater ease when refitting rudder nuts. Besides minimising the likelihood of incidents and pinch-point injuries, higher productivity is also achieved with refitting time sped up by 35%.

- **Portable Platform**

The Portable Platform was developed by Jurong Shipyard and Seah Marine Engineering to provide scaffolders with a temporary platform and a secure standing point in the ship's cargo hold for the manual distribution of scaffold materials in areas where air winches cannot be set up. Comprising a grated platform, the light-weight Portable Platform is designed with two secure points made up of four hooks to be secured to the ladders to provide workers with a proper foothold instead of having to juggle their weight on the ladder. This enhances safety during the scaffold erection process and leads to increased morale on the job.