

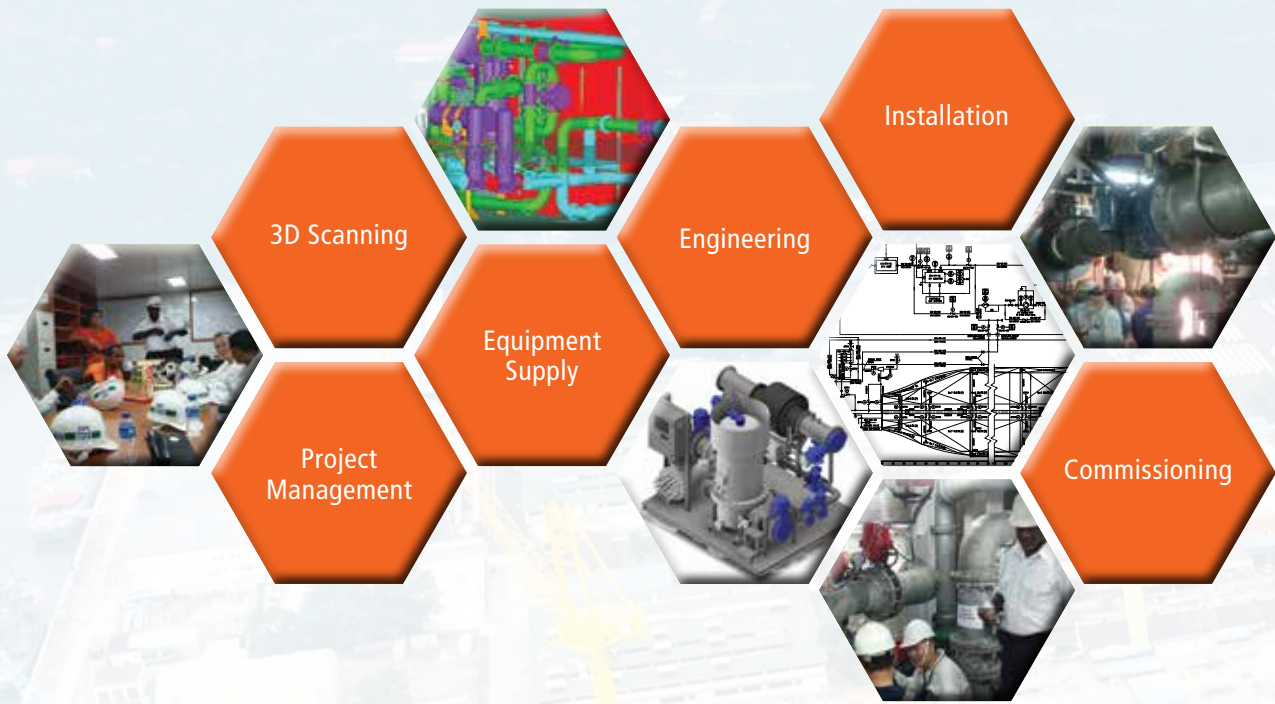


REPAIRS & UPGRADES

ASIA'S PREMIER SHIPYARD GROUP FOR
GREEN TECHNOLOGY RETROFIT SOLUTIONS



RETROFIT TURNKEY SOLUTION



WHY US?



Green technology retrofits are challenging and require seamless coordination with the manufacturers, engineering, installation and commissioning teams.

We have the SOLUTION.

Sembcorp Marine provides innovative engineering solutions to the global marine and offshore industry, drawing upon our track record of over 50 years. Our customers include major oil companies, drilling contractors, shipping companies as well as owners and operators of floating production units. We operate shipyards strategically located in Singapore, India, Indonesia, the United Kingdom and Brazil.

Within Sembcorp Marine, our Repairs and Upgrades capability has proven expertise in the repairs of conventional and non-conventional vessels as well as strong track record in offering owners with turnkey solutions including green technology retrofits and upgrading, specifically in the area of Ballast Water Management System (BWMS) and Exhaust Gas Cleaning System or commonly known as scrubbers.

Our Approach:

- ▶ Establishment of comprehensive technical and cost effective specification, leveraging on our extensive experience in repairs, upgrades and conversion works.
- ▶ Applying project specific responsibility matrices.
- ▶ Review green technology product specification in collaboration with affiliated manufacturer.
- ▶ Preparation of engineering package for Statutory and Classification approval for green technology installation.
- ▶ Coordination of key logistics and Factory Acceptance Test attendance.

OUR STRENGTHS

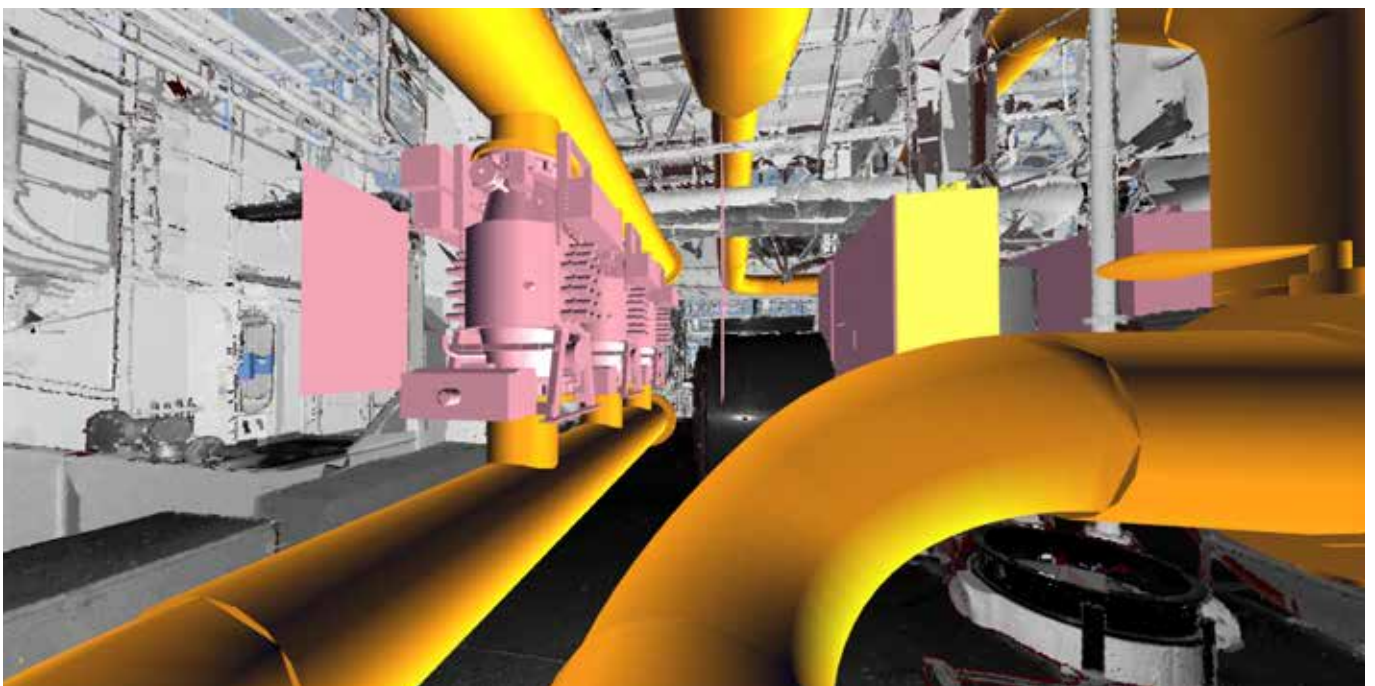
- ▶ Engineering Design Office staffed by a competent team of more than 150 Engineers and Designers from various engineering disciplines.
- ▶ Dedicated division focused on green technology and solutions development to support retrofit engineering and installations.
- ▶ Fully equipped covered workshop facilities for structural, mechanical and electrical to facilitate prefabrication and other preparations.
- ▶ Ample sheltered stores and open ground storage areas are available for retrofit project equipment.
- ▶ Commitment to conducting our business in compliance with legislative requirements and ensuring that the industry's highest HSE standards are practised in all our work processes.





GETTING STARTED

- ▶ Systematic vessel surveys with ship operations team to identify the engineering baseline for retrofit objectives
- ▶ 3D laser scanning to digitize the vessel interior (or exterior) environment for design engineering use and portability
- ▶ 3D modelling for detailed engineering and enhanced project planning
- ▶ Feasibility study to assess the suitability of the green technology choice on specific vessels



OUR REFERENCES



Vessel Type: VLCC

- 2 x 3000 m³/h BWMS (Electrolysis, Side Stream)
- Installation Location: Pump Room & Engine Room
- 15 Days Installation
- 3 days of Commissioning by Maker



Vessel Type: LPG Carrier

- 2 x 500 m³/h BWMS (Electrolysis, Full Flow)
- Installation Location: Engine Room
- 14 Days Installation
- 5 days of Commissioning by Maker



Vessel Type: Cable Laying Vessel

- 2 x 100 m³/h BWMS (Electrolysis, Full Flow)
- Installation Location: Engine Room
- 10 Days Installation
- 3 days of Commissioning by Maker



Vessel Type: Cruise Ship

- Air Lubrication System
- Installation Location: Engine Room/Hull
- 9 Days Installation

Vessel Type: Asphalt/Bitumen Tanker

- 2 x 500 m³/h BWMS (UV)
- Installation Location: Pump Room
- 15 Days Installation
- 3 days of Commissioning by Maker



OUR REFERENCES



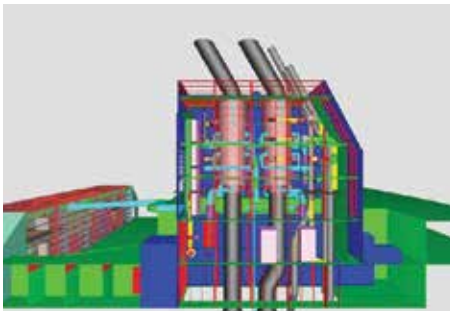
Vessel Type: Asphalt / Bitumen Tanker

- 1 x 250m³/h BWMS (UV)
- Installation Location: Engine Room
- 12 Days of Installation
- 3 Days of Commissioning by Maker



Vessel Type: Multi Purpose Carrier

- 1 x 500m³/h BWMS (UV)
- Installation Location: Engine Room
- 7 Days of Installation
- 3 Days of Commissioning by Maker



Vessel Type: RORO

- 2 x 9MW Scrubbers
- 30 Days of Installation
- On Voyage Commissioning by Maker

Vessel Type: Car Carrier

- 28MW Multi-Stream Scrubber
- 30 Days of Installation
- On Voyage Commissioning by Maker

Vessel Type: Cruise Ship

- 3 x 8.6MW Scrubbers
- 14 Days of Installation
- On Voyage Commissioning by Maker