



TURNKEY SOLUTION FOR RETROFITTING OF BWTS

This presentation has been prepared by the technical team of HSM Marine, to detail the turnkey BWTS retrofitting solutions offered, as per the IMO 2020 & MEPC Compliance.

Introduction

A Brief Story About The Company

HSM Marine Engineering Pte Ltd specializes in Ship Repair, Retrofitting, Fabrication and Project Management Services in the Maritime Industry. Since inception, the company has undertaken numerous projects from various Ship Owners/Ship Management companies worldwide and has specialized in offering optimized custom solutions to meet various client's demands and requirements

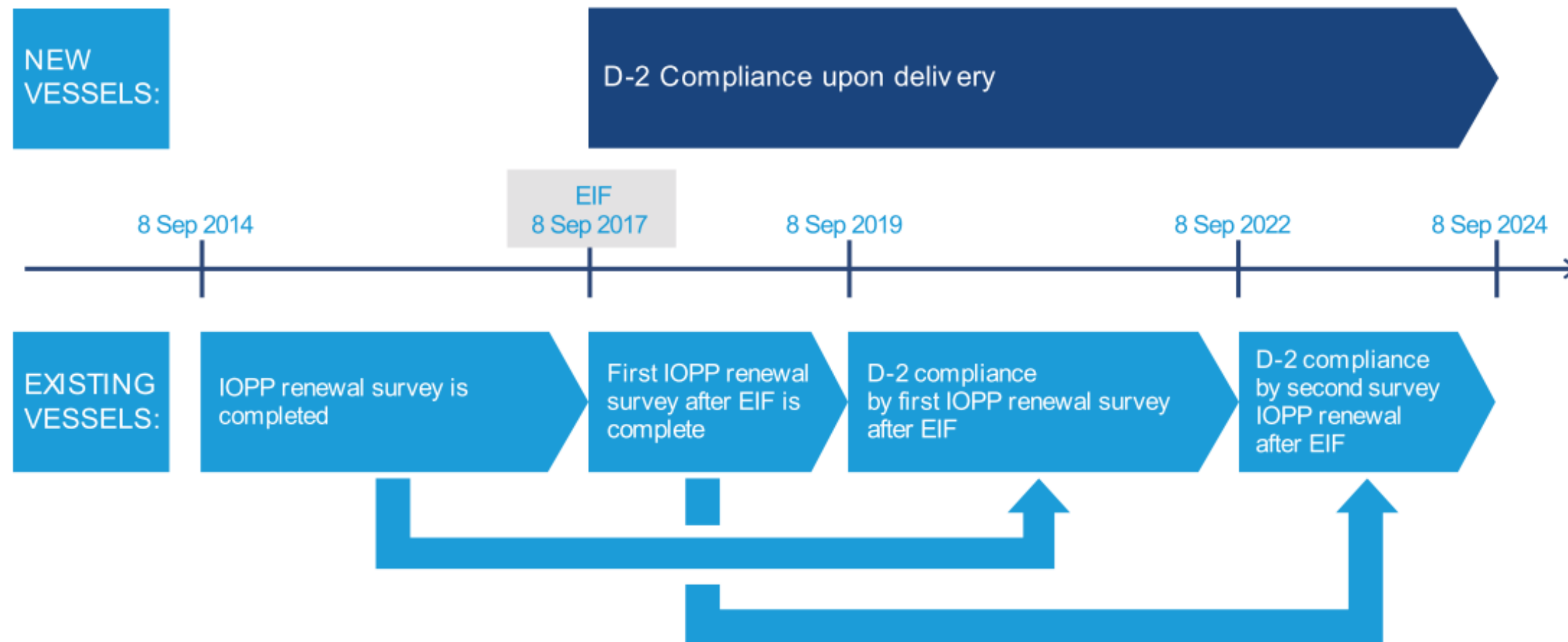
Optio Marine is a global maritime consultancy that provide a comprehensive range of services: 3D Laser Scanning & 3D Modelling, Detailed Design & Engineering and Project Management to the Maritime and Oil & Gas industries. We offer smart, customized solutions that cover the full engineering and operation cycles for all types of marine and offshore vessels.

Together we provide turnkey solution to meet all type of vessel Ballast Water Treatment System requirement with our most cost optimized solutions.



Regulations

- According to the MEPC 71 meeting in June 2017, ships constructed before 8 September 2017 must comply with the BWM D-2 standard by the first IOPP renewal after 8 September 2019.
- As per MEPC.325(75) with amendments to regulation E-1, its mandatory to do commissioning testing by sampling from 1 June 2022.





BWTS Makers

There are various number of technologies available for the ballast water treatment few major treatment techniques are

- Electrolytic system
- UV System
- Chemical Injection System

BWTS Selection Criteria

Fully Certified

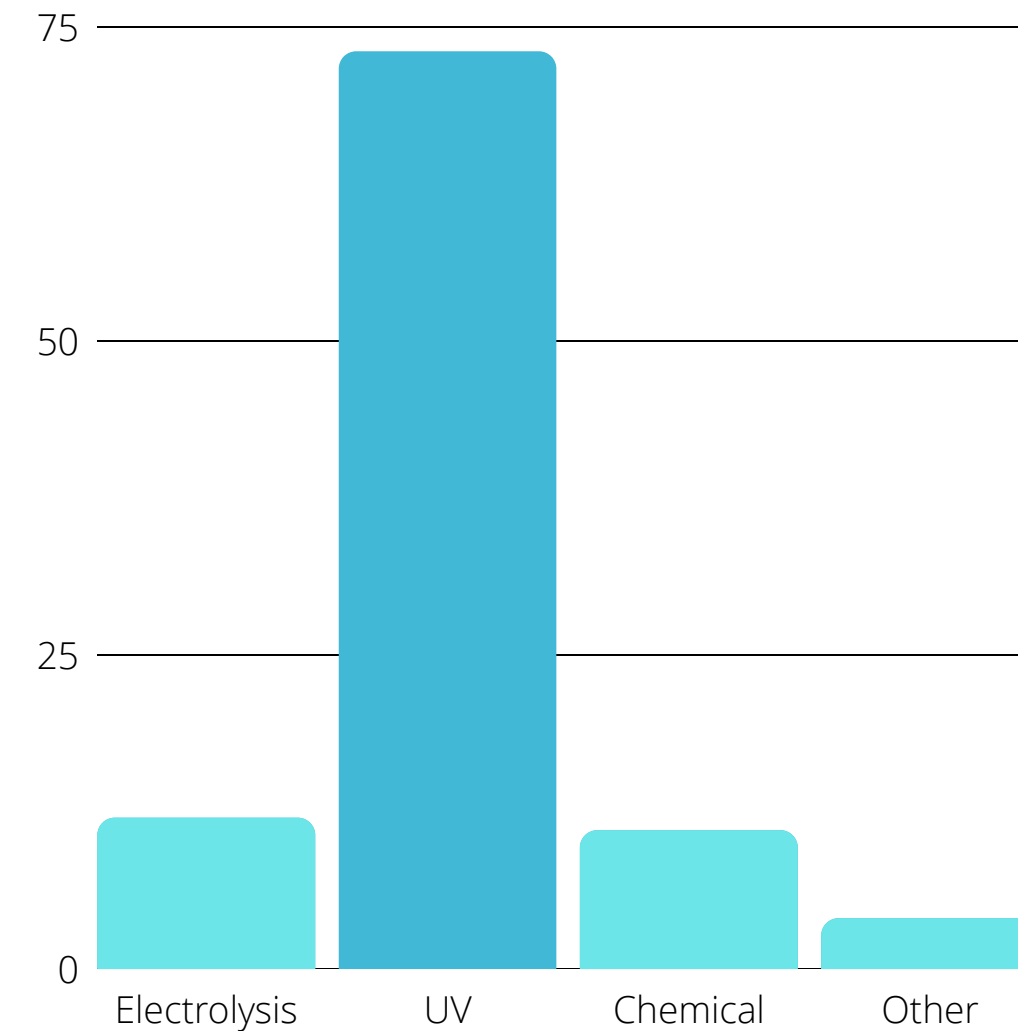
IMO & USCG type approved, suitable for all water types

Smart Savings

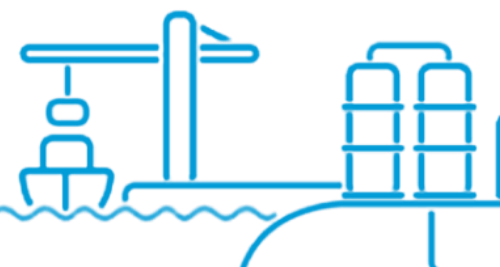
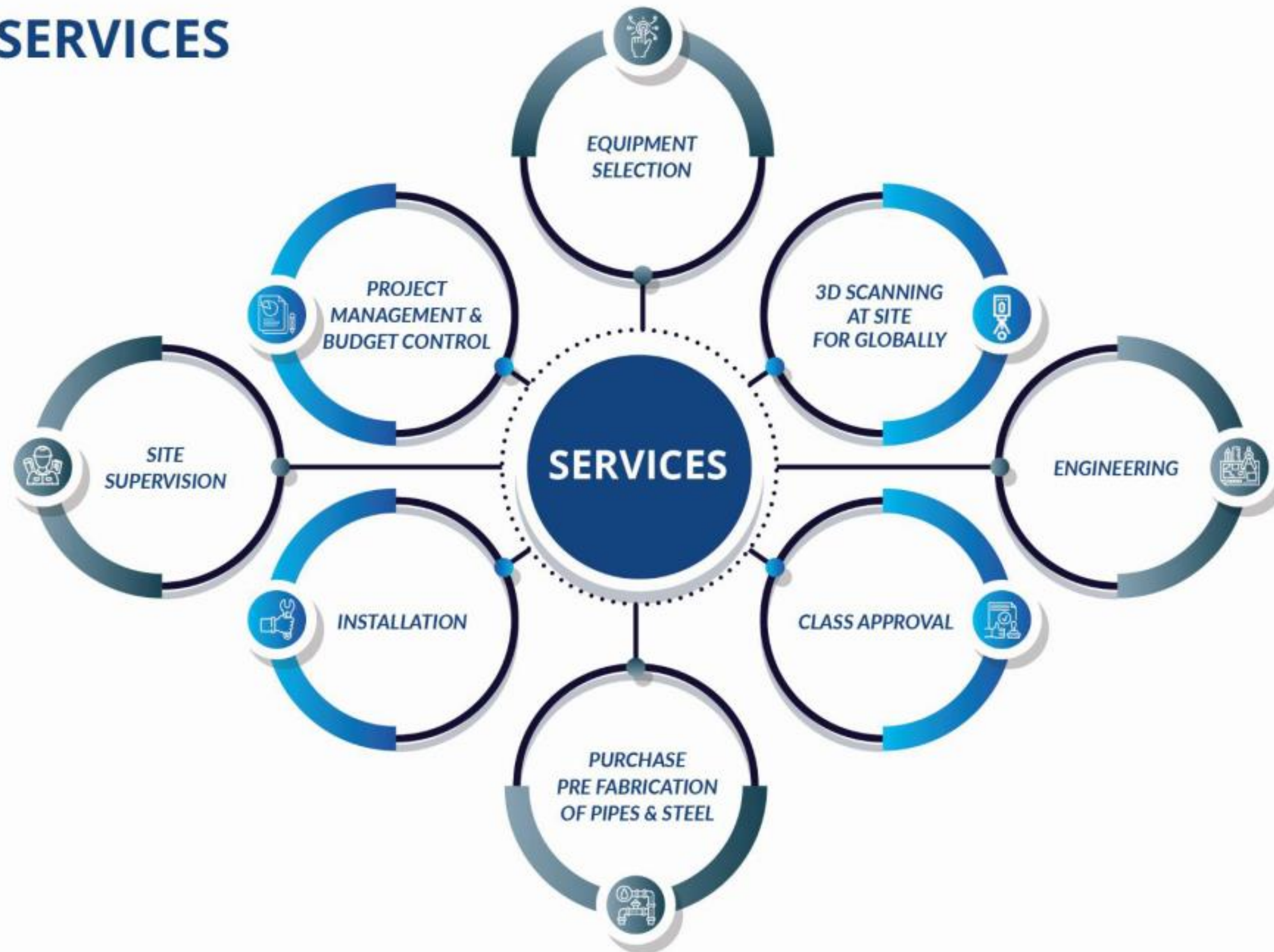
competitive CapEx & low OpEx for a system fit for your vessel

Small Footprint

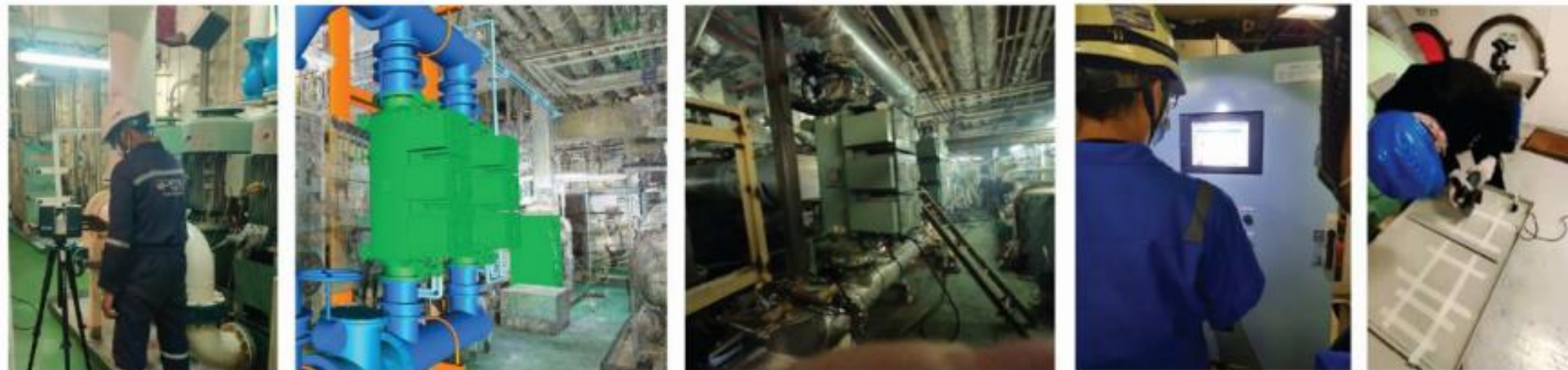
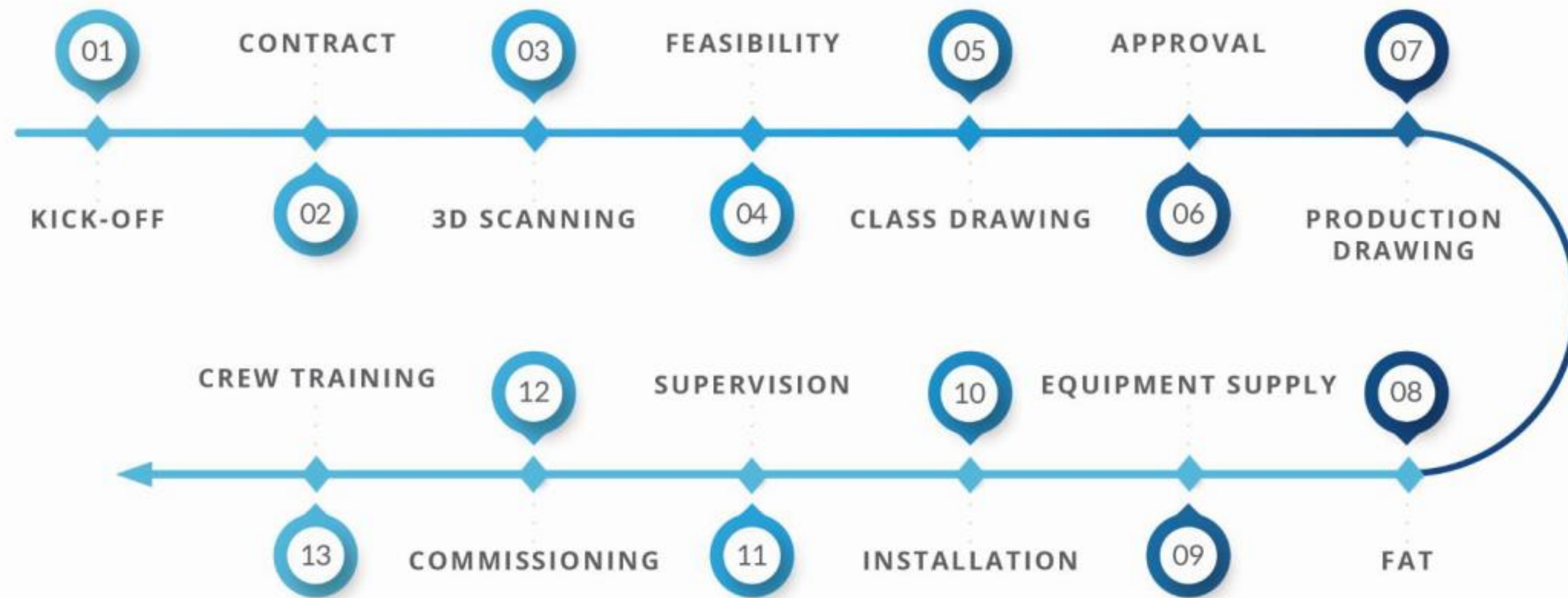
Equipment with less footprint to be selected upon space availability.



SERVICES



Process



3D Scanning

The initial phase of the retrofit process involves capturing of As Build information of the vessel.

Our team utilize high accuracy 3D scanners to capture the actual condition accurately.

Equipment Make: Faro Focus Laser
Scanner



Activities

- Travel Arrangement
- Planning & Desk Study
- 3D Scanning & Inspection

Deliverables

- 3D Scan & Survey report

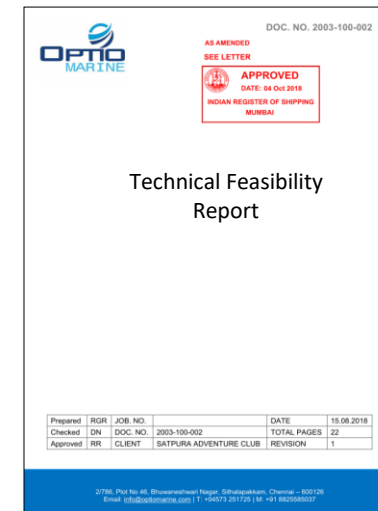
Purpose

- To Capture the At Site Condition of the vessel

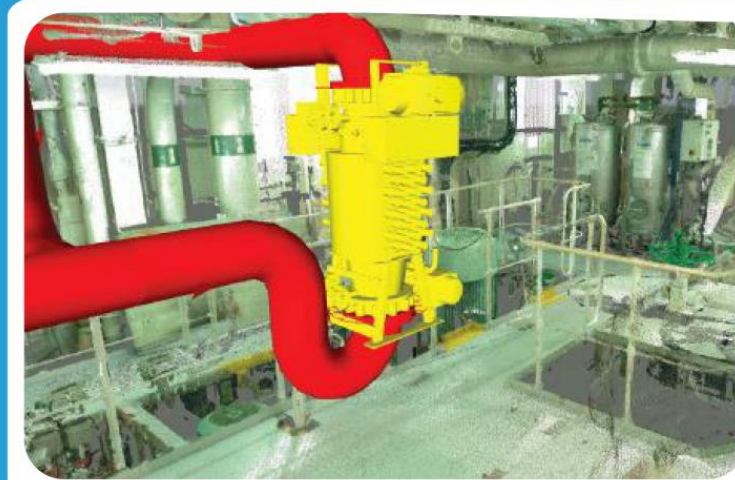


Feasibility Study

The initial phase of the retrofit process involves understanding of the clients requirement. And techno commercial suitability of retrofit demand is carried out. The study is supported by virtual installation of multiple retrofit system and its suitability is analyzed.



BEFORE



AFTER

Activities

- Layout and Arrangement Study
- 3D Based Space allocation
- 3D Concept Modeling

Deliverables

- Scanned 3D Model & Inspection report
- Layout and Arrangement Study
- Technical Feasibility report
- Preliminary weight report

Purpose

- Preliminary Material Take Off
- Preliminary weight report
- Capex and Opex Decision

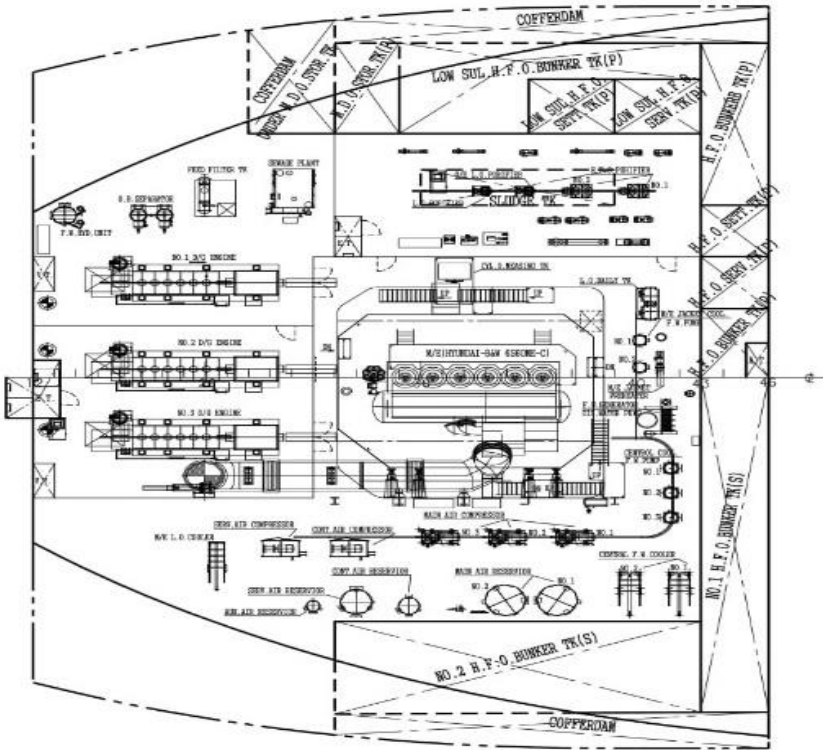




Class Drawings

This level of design is to identify different parts of complete design and its integration with existing vessel systems.

The drawings and supported documents prepared are submitted for IACS Class review and approval

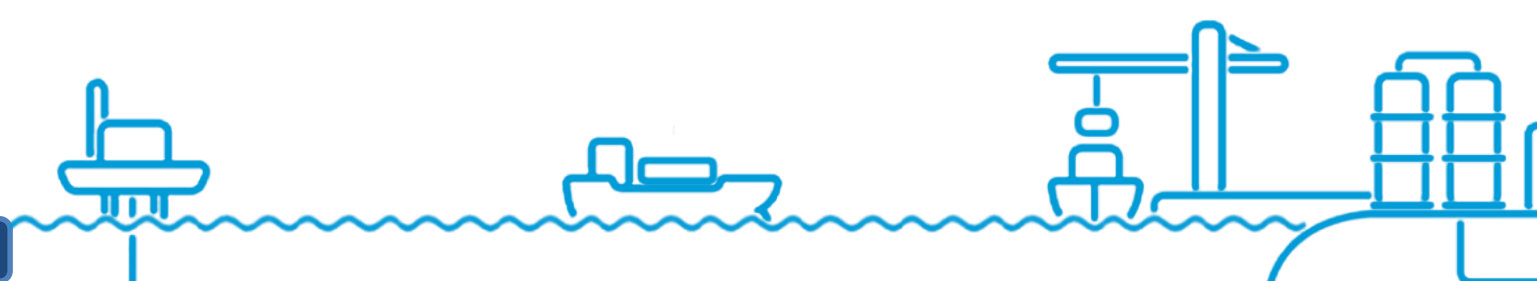
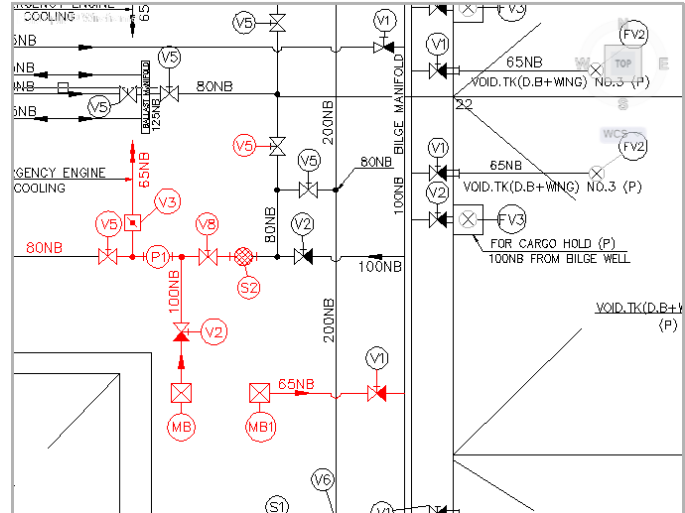
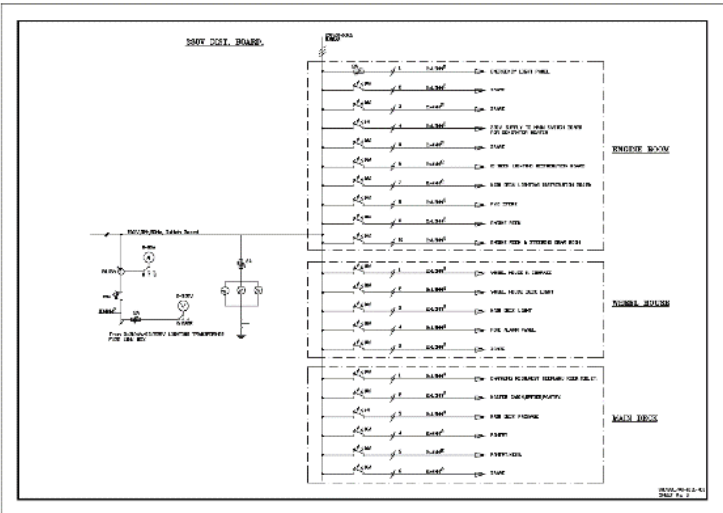


Activities

- System Design
- Calculations
- Layout Modification
- Light Ship Weight report
- Stability

Deliverables

- Modified Layout Drawings
- Modified Structural Drawings
- System P&ID and Schematics
- Equipment Foundation Analysis
- Modified Electric load chart
- Modified Single Line Diagram
- Other as requested by Class

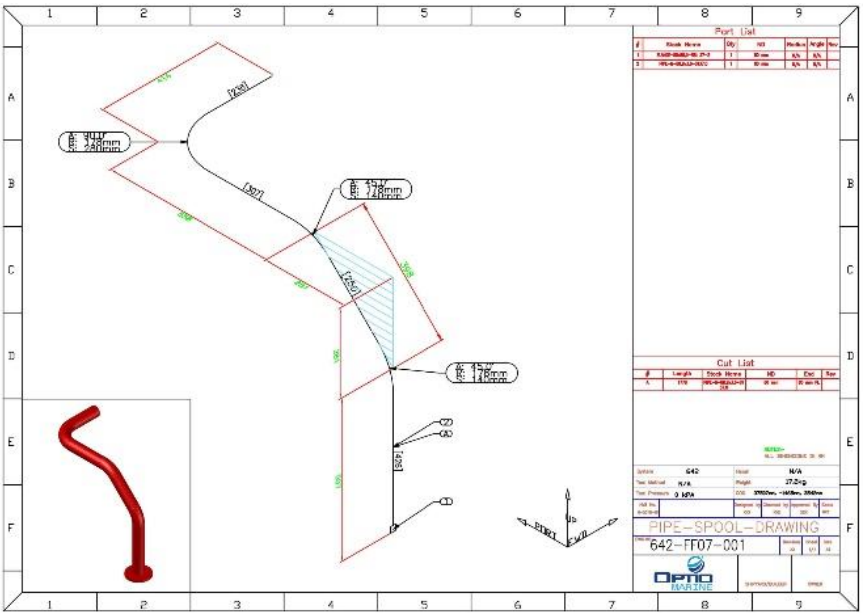




Installation Drawings

This phase involves detail analysis of different part of the complete design specific to installation of equipment on board the ship.

This drawings and documents are prepared in international standards which can be interpreted by the qualified team for procurement and installation.

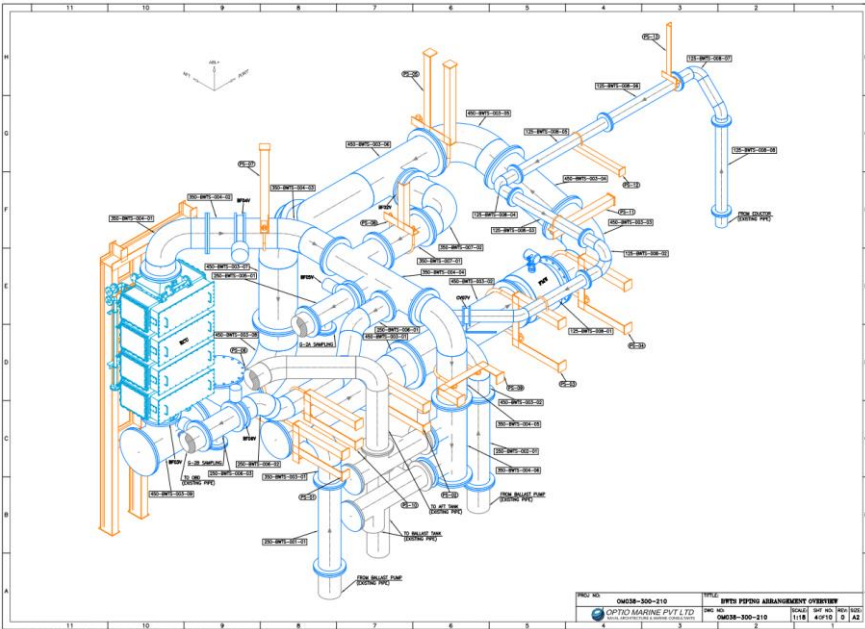
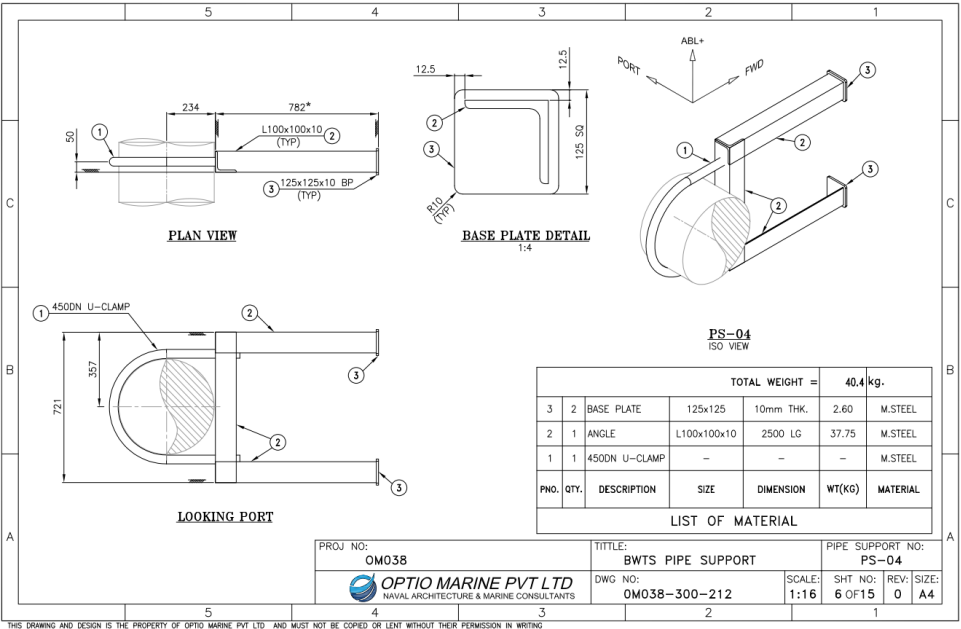


Activities

- Detailed 3D Modeling
- Clash and Ergonomic Analysis
- Production Documentation

Deliverables

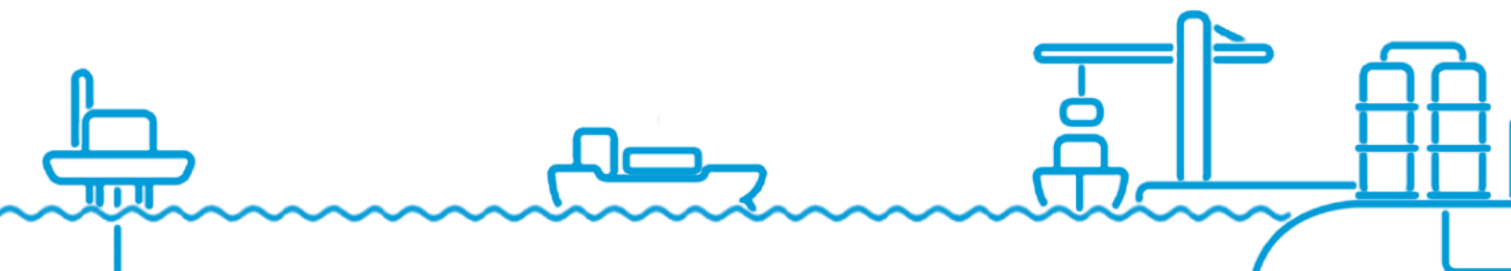
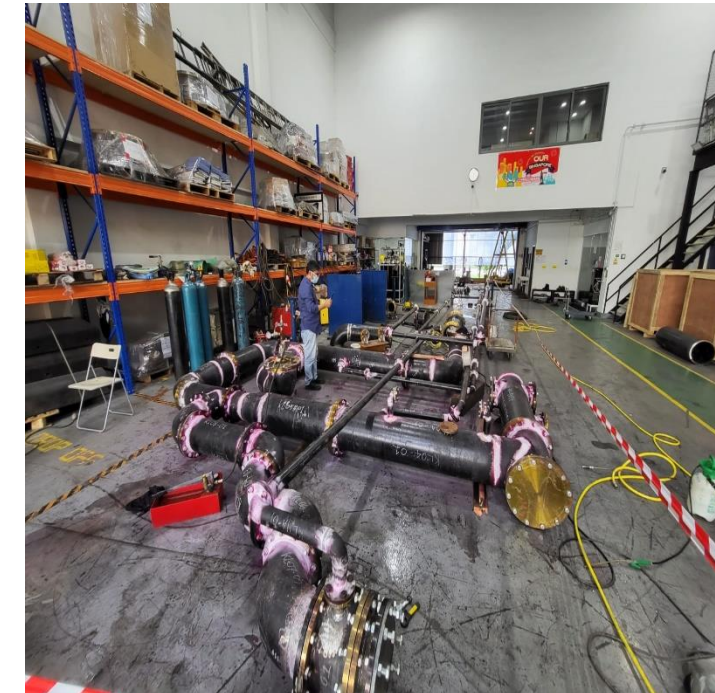
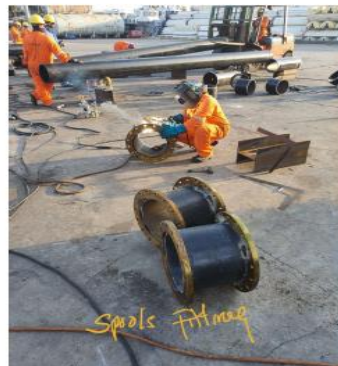
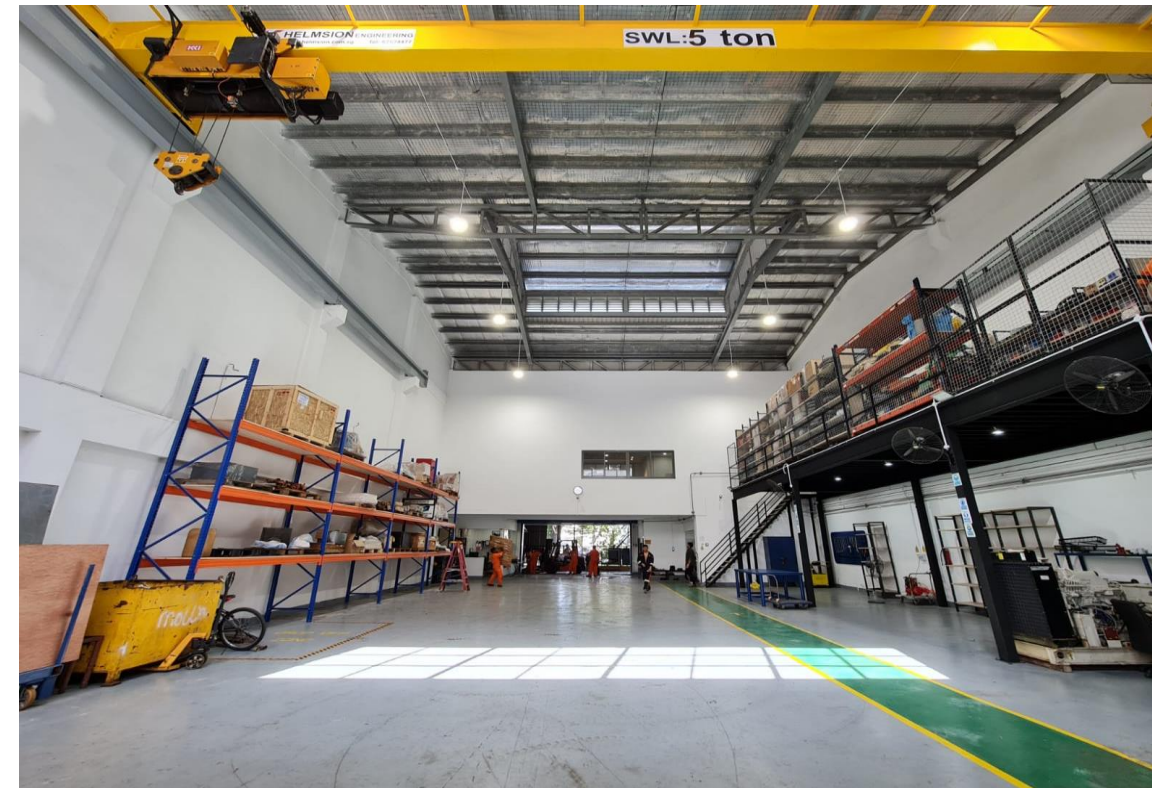
- Installation Plan
- Structural Foundation Drawings
- Piping Installation Drawings
- Piping Isometric Drawings
- Piping Support Drawings
- Final Material Take Off



Pre-Fabrication

Upon Completion of Detail Drawings & Class Approvals of Drawings. Material Procurement, Quality Documents & Fabrication Plan is prepared, this includes

- Sourcing Of Material in compliance to ASTM standard. (To be Witnessed by Class Surveyor)
- Preparation of cutting plan to ensure minimum wastage of Material.
- All fit-up and welding works to be completed by class approved welders, following valid WPS.
- All welding seams undergo DPT, Visual Inspection and Hydro test to ensure Top Quality (To be witnessed by Class Surveyor)
- All C.S Pipe to undergo Galvanizing as per ASTM recommendation.
- All items required for installation (Pipes, Cables, Machinery & Consumables), to be labelled, Inspected & Packed to ensure safe and smooth delivery to vessel around the world



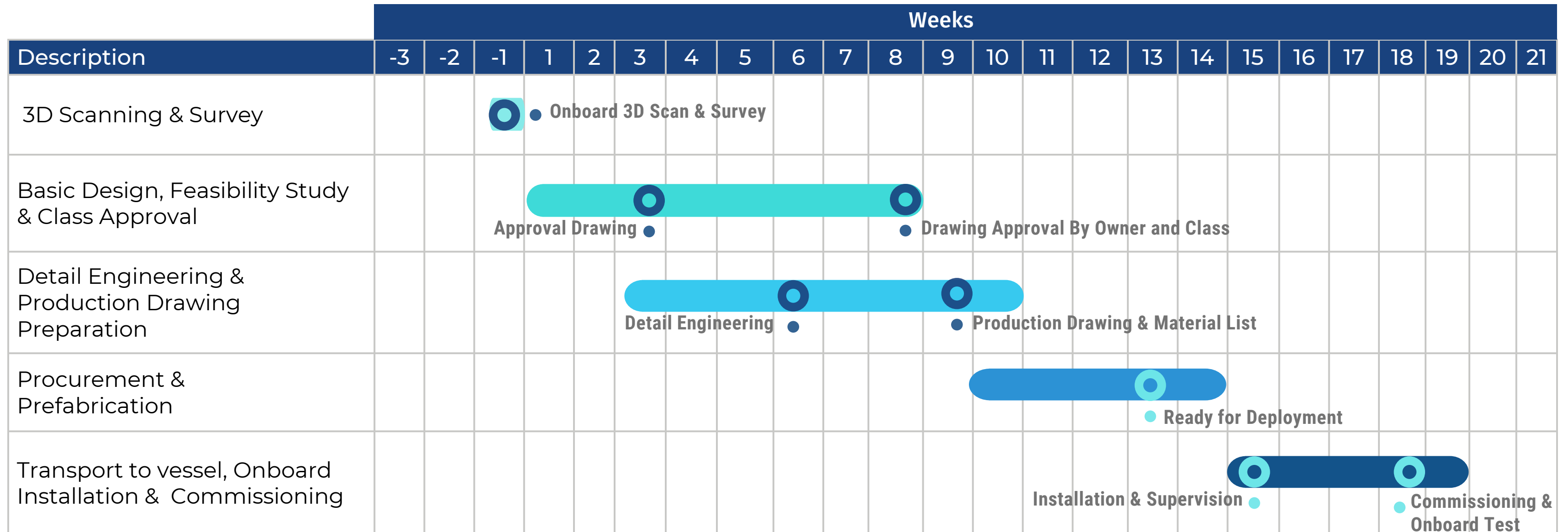
On Ride Installation

Upon Completion of Pre-Fabrication Scope, an Installation Plan is developed. This includes

- Identification of In-House Team Members suitable for the scope of work
- Preparation & Review of necessary documents of riding squad such as STCW, CDC, Vaccination, Visa and etc.
- A detailed installation Manual is prepared as per the Installation Plan and submitted to Clients, highlighting the timeline.
- Riding Team Sign On & Sign Off and Travel arrangements is planned
- After commencement of Installation Works, Technical Team (Sg) will be remotely monitoring daily progress and provide daily reports to clients, they will also provide 24/7 support to our Riding Squad.
- Upon successful completion of Installation Works, the team shall provide assistance to Maker's Service Engineer until SUCCESSFUL COMMISSIONING.



Timeline



Value Addition

Commercial

- Cheaper than Dry-dock Installation
- Additional Modification Cost significantly lower
- Reduces dry-dock period to standard 10-12 days.
- Eliminates the requirement to off-hire the vessel
- Upon Completion, BWTS Team can be utilized for planned maintenance / upgradation scopes to further improve the vessel performance at a Marginal Cost

Extra Benefit

- Strict Compliance to Quality and International Standards
- Well Structured Plan to promote Optimized Time Efficient Work Flow
- Dedicated PIC to Client, to ensure Smooth & Effective communication at all times
- A Complete Turnkey Package from Sourcing of Equipment to Commission of System
- Global Operation, Not restricted by any border restrictions





Our Projects

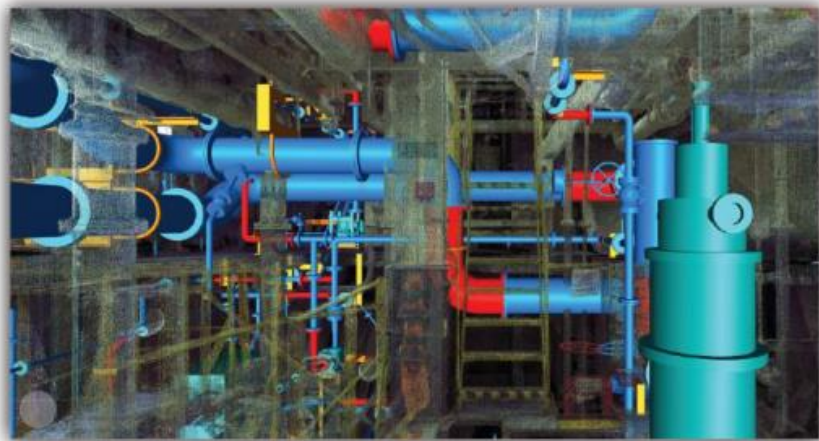
55+ 40+ 38+

3D Scanning Engineering Installation

Makers We Worked With



Our Recent Works

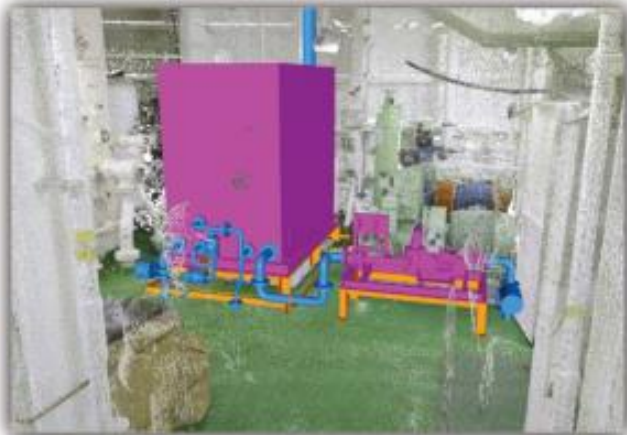
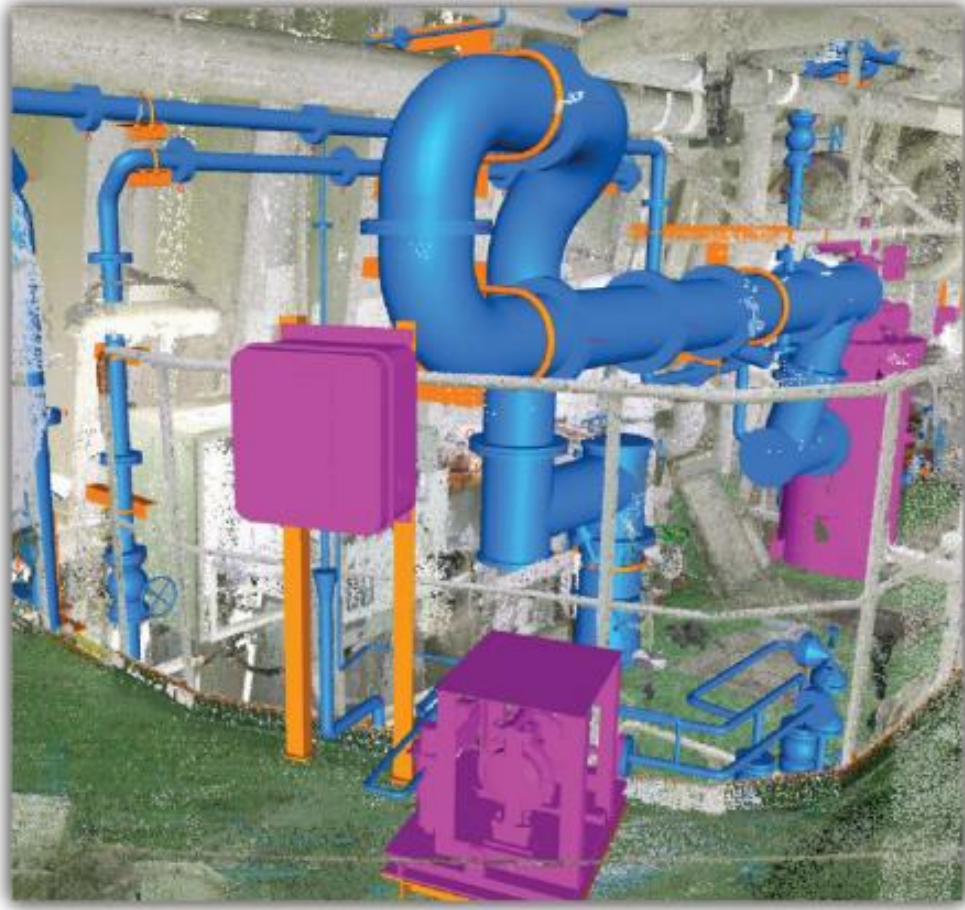


Ship Type	Installation Area		Ship Owner	BWMS Model
37K DWT Bulk Carrier	Engine Room		Marshal	BC 500x

Ship Type	Installation Area		Ship Owner	BWMS Model
Chemical Tanker	Pump Room		Marshal	Pure Ballast 3.2



Our Recent Works



Ship Type	Installation Area		Ship Owner	BWMS Model
57K DWT Bulk Carrier	Engine Room		Norway	ECS 900x

Ship Type	Installation Area		Ship Owner	BWMS Model
76K DWT Bulk Carrier	Engine Room		Qatar	BC 1000x1



Our Services



What We Do Best!

■ Complete Engine Repair

- Engine Unit Complete Overhauls
- Timing Gear Adjustment
- Generators Complete Overhauls
- Fuel Pumps Repair / Overhaul
- Crankshaft & Bearing Inspection / Renewal

■ Steel & Pipe Renewal, Modification & Installation Service

- Hull Repair
- Deck Outfitting & Repair
- Pipeline Renewal & Repair
- BWTS Fabrication & Installation

■ Electrical & Automation Support

- Pneumatic and Control System Troubleshooting & Servicing
- Fire Detection System Troubleshooting, Service & Repair
- Boiler, Purifier & Compressor
- Communication & Navigation Equipment

■ Hydraulic Repairs

- Shipboard Hydraulic Machineries
- Retrofitting of Mooring & Windlass Gear
- Overhauling of Hydraulic Motor & Pump

■ Extra Value-Added Services

- In-House Rigging Team
- Lay-up Management & Reactivation services
- Complete range of Audits & Inspections
- Stockiest of reconditioning spares/equipment at Alang (India) & Chittagong (Bangladesh)
- Spares Supply - Navigation / Hydraulic Motors & Cylinders / Engine Components



Ship Design

- Naval Architecture
- Structure Engineering
- Piping Engineering
- Mechanical Engineering
- Electrical Engineering

Green Solution

- 3D Scanning
- BWTS Retrofit
- EEXI Calculation
- IHM Compliance
- Ship Recycling Supervision
- EEXI & CII Calculation
- Alternative Fuel Conversion

INSPECTION

- Condition Survey
- Marine Warranty Survey
- Pre Purchase Survey
- Loading and Lifting Survey
- IHM Survey

Drydocking & Newbuild

- New Build Supervision
- Retrofit Supervision
- Drydocking Specification
- Yard assessment





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One Umbrella.

International Office & Workshop



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USA



Korea



Head Office

SINGAPORE



69M Sea town Industrial
Tuas South Avenue 1,
Singapore- 637505



sales@hsm-marine.com



+65

INDIA



#87, Radha Nagar,
1st Main Road Perumbakkam,
Chennai 600 100
Tamil Nadu - India



info@optiomarine.com



+91 44 22771120