



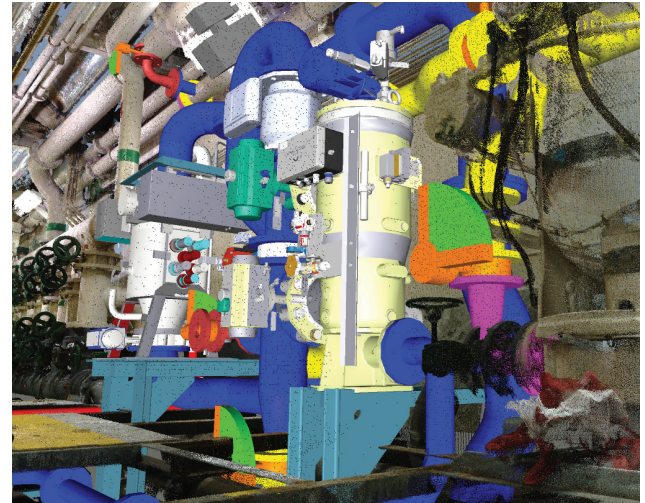
**Offshore fleet operator employed GLO MARINE to perform survey, 3D scan & engineering simultaneously for 3 OSVs in timeframe of 6 weeks (from fleet of 6 vessels).**

### Scope of work

- 3D laser scanning & Survey
- Feasibility study
- Engineering & class approval
- Installation Supervision

### Challenge

- Extremely crowded engine room – difficult to integrate the equipment and maintain operational integrity of room
- Simultaneous survey & scan for 3 vessels
- 6 weeks timeframe to deliver complete engineering & design for all 3 vessels



### Project Facts

- **Ship Type:** Offshore TUG / Supply Vessel
- **Displacement:** 5914.36 t
- **Length Overall:** 81.0 m
- **Class:** American Bureau of Shipping (ABS)
- **Alfa Laval PureBallast 3** - Ballast Water Treatment System - 170 m<sup>3</sup>/h
- **4 days – Feasibility, Survey & Scan**
- **15 days – Complete Design**

### Key factors for successful installation

1. Teams experience in various integration situations – problem solving skills
2. Adaptability & highly effective project management
3. Very experienced surveyors
4. Close cooperation with owner, vendor, class and shipyard

## Phase 1: 3D laser scanning & Survey

**Team:** 1 experienced marine surveyor + 1 laser scan technician

Dedicated field service teams deployed to remote location in Indonesia where ships were berthed for other retrofitting jobs and performed 3D scans of engine room and survey for all 3 vessels in just 3 days.

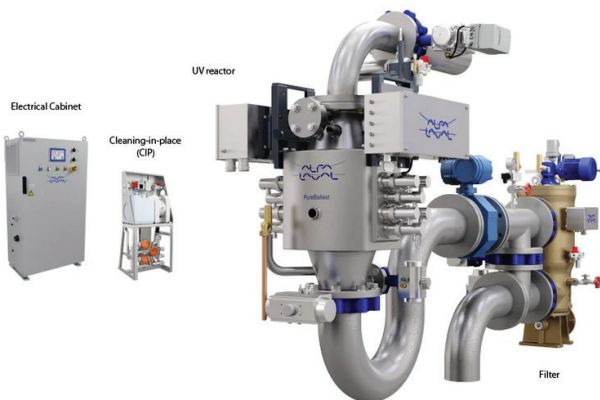


## Phase 2: Feasibility study

**Team:** 1 Lead Piping Design Engineer

Advanced feasibility study and troubleshooting to determine the best cost and time effective solutions in order to minimize impact on existing structures.

Our experts provided consultancy to client regarding the choice of the best BWTS that suited client requirements.



## Phase 3: Basic Design & Class Approval

**Team:** 1 Lead Piping Engineer & 1 Electrical Engineer

Design team prepared the documents for basic design in accordance with the actual regulations.

Engineering optimization required due to lack of space in engine room for each of the 3 vessels.

Engineering review performed with vendor company done almost simultaneously with the basic design package.

## Phase 4: Detail Design

**Team:** 4 Piping Engineers (1 Team Leader)

Design Team successfully integrated all the challenges caused by very limited available space onboard. Our main objective was to complete the model, taking into consideration: minimum impact onboard, system functionality, cost efficient solutions and less site work to be done in the installation phase.



## Phase 5: Installation supervision

Client has appointed GLO MARINE to supervise and coordinate the future installation process onboard the 3 vessels.

## The result

The whole process of the ballast water treatment system integration was completed in an excellent timeframe of one month, as demanded by the client, in order not to have even a day of downtime.

As a result of the accuracy of the scanning and the excellent collaboration between the planning and engineering departments, the project was executed millimeter level accuracy.



**3**

**weeks**

project completion

**3**

**vessels**

scanned simultaneously

**optimization**  
of installation process

## Client benefits

How the client benefited from choosing GLO Marine to deliver the BWTS engineering package:

- Cost savings from efficient planning & project management
- No time lost
- Best engineering solution for optimized installation process
- 3 vessels scanned at the same time by 2 teams
- No downtime – engineering completed in record time of 3 weeks for all 3 vessels
- Peace of mind during the whole process – very good communication and status control

**0**

**days of downtime**

**25**

**days of operation saved**

**cost**  
**savings**

**excellent planning & simultaneous work**  
on class approval

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