TURNKEY BALLAST WATER TREATMENT SYSTEM RETROFIT IN ASIA

OPTIMARIN OBS 1000M³/HR - CONTAINER SHIP

Optimarin Japan contracted Goltens Singapore to perform a turnkey installation of Optimarin's OBS onboard a 79,417 DWT Container vessel operating in Asia. The plan was to follow Goltens' Green Technologies process to verify the system fit, model the layout, perform detailed engineering, prefabricate all piping and install and commission the system prior to the vessel finishing its upcoming yard period in China.

SCANNING, MODELING AND ENGINEERING:

Goltens performed extensive 3D scans of the engine room while the container vessel was in normal operating condition over 6 hours while berthed in Singapore.

A 3D model of the Optimarin system was overlaid onto the 3D model created from the scan to show how the system fit. Once reviewed and approved by the owner, Goltens performed detailed engineering for all piping, foundations and related steel work and sent it to the class society (NK) for review and approval.

A voyage inspection was then carried out to verify the drawings against the as built conditions and to review loading plans, cable routing and penetrations as well as other factors to make the installation as efficient as possible.

PIPE PREFABRICATION:

Due to the accuracy of the laser scans (±2mm), all piping could be prefabricated. With careful attention and quality control procedures applied to the pipe prefabrication in Goltens' Vietnam workshop, a tremendous amount of time during system installation would be saved as opposed to the pipes being welded and fit onboard. All prefabricated piping was shipped to Goltens Singapore and it along with other material and tooling required for the installation was then onboarded when the vessel returned to Singapore.

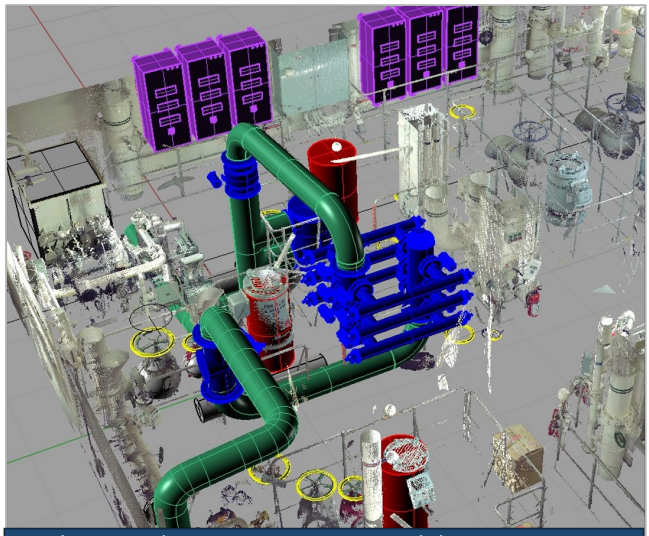
RETROFIT INSTALLATION:

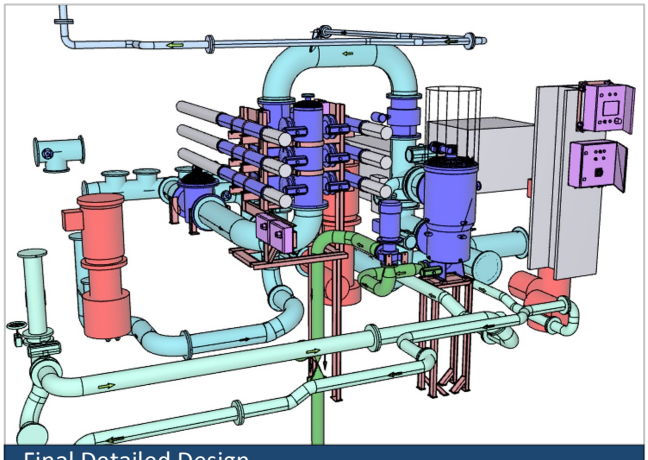
Voyage installation was carried out with a 5 man riding crew consisting of 2 Engineers, 2 Fitters and 1 Electrician. During the planning phase, Goltens had anticipated a chaotic situation in the drydock and completed most of the heavy lifting and hot work during voyage before the vessel

PROJECT FACTS: TURNKEY BWTS RETROFIT

Ship Type:	**Container Ship**
Weight:	**79,417 DWT**
Class:	**Nippon Kaiji Kyokai (NK)**
Ballast flow rate:	**1000 m³/hr**
Ballast treatment system:	**Optimarin OBS 1000 m³/hr**

3D Laser Scanning in the engine room


Preliminary design over 3D scan model


Final Detailed Design

reached Yiulian Shipyard in Shekou, China to avoid unplanned delays.

The installation was completed during vessel's drydock in after the ballast pipes were drained. Existing pipes were removed and replaced with the prefabricated pipes connect the BWTS to the existing ballast system. The entire installation was completed before the vessel left the drydock, just in time for commissioning to take place.

Goltens Shanghai technical personnel then carried out commissioning when the vessel was alongside the pier. Optimarin's commissioning engineer was present during the commissioning to perform function checks and pressure tests on the system. Training was also conducted for the ship's crew on how to operate the system during various conditions.

BWT SYSTEM RETROFIT SCOPE:

- 3D laser scanning on board vessel and study of operational requirements of the vessel
- Creation of an overlay model of the BWTS onto 3D model of engine room
- Delivery of preliminary design which included a conceptual design by integrating 3D model of engine room and BWTS.
- Machinery loading and routing plan
- Document submission for Class approval
- Detailed design engineering of production drawings
- Prefabrication and installation of new ballast piping and connection to the BWTS
- Prefabrication and installation of new distribution panel
- Installation of pneumatic control system
- Connecting all electrical parts and panels
- Pressure testing of the system post installation
- Commissioning of system
- Delivery of final report with operating procedures

RESULTS:

The onboard installation of the Optimarin 1000m³/hr system was completed in 7 days on voyage followed by 18 days in dry dock. As a result of the accuracy of the scanning and the careful planning and modeling, the project was executed with almost no modification of existing equipment. With three Goltens stations involved in the execution, the project is another great example of the value of the Goltens network.

Rigging materials and equipment onboard

Filter installation during drydock

Interlock panel termination during drydock

Optimarin OBS 1000m³/hr system installed