

HYDE GUARDIAN HG200L BALLAST WATER TREATMENT RETROFIT FOR CONTAINER SHIP

3D SCANNING, DESIGN, PREFABRICATION AND INSTALLATION OVERSIGHT

Seaboard Marine, a major container operator in Miami, contacted Goltens Green Technologies' specialists in Miami to undertake and manage the end-to-end retrofit of a Hyde Guardian HG200L ballast water treatment system onboard the Seaboard Atlantic. The Seaboard Atlantic, built in 2009, is one of 30 vessels that Seaboard operates between the US and major ports throughout Latin America and the Caribbean.

Goltens met with Seaboard to discuss the timing and scope of the project, which included completing the installation of the system during dry-docking in Bahamas at the end of 2013. The proposal was accepted and the project was started in July of 2013 with 3-D scanning of the vessel while in port in Miami.

THE PROJECT SCOPE:

Goltens proposed a comprehensive project plan that included:

- 3-D Scanning, Survey and Modeling
- Detailed engineering including pipe isometrics, foundation drawings and an installation manual
- Pre-fabrication of all required piping and materials
- Delivery of complete, prefabricated installation kit to shipyard in Bahamas
- Project management and oversight of the installation in the shipyard
- Commissioning of the system with Hyde technical representative

BWT RETROFIT RESULTS:

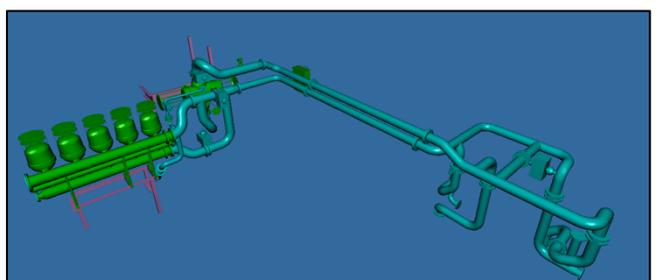
All piping and installation materials were delivered to the shipyard in December of 2013 as planned for the yard period. The installation by the shipyard went smoothly and was completed on time with commissioning being completed in January 2014. The installation was fully reviewed and approved by vessel's class, Germanischer Lloyd.

PROJECT FACTS:

Ballast Water System:	Hyde Guardian HG200L
Ballast Flow Rate:	200 M ³ /hour
Vessel Type:	Container Ship
Year Built:	2009
Tonnage:	11,007 DWT



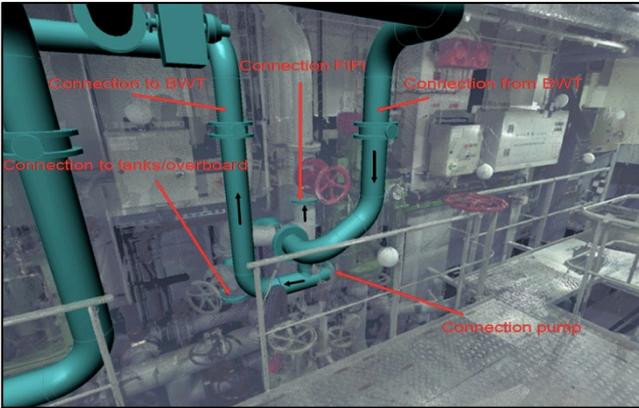
BWT System overlaid on 3D scan results



Rendering of designed Hyde BWT System



BWT System overlaid on 3D scan results



Overlay showing connections with existing systems



Overlay showing connections with existing systems

Goltens Engineer unwrapping prefabricated pipes



Shipyards workers installing prefab piping kit



Preparing filter units for installation



Goltens Electrician performing electrical install

