

TWO TURNKEY NK-O3 BLUE BALLAST SYSTEM RETROFITS FOR ERNST JACOB

GOLTENS' GLOBAL BALLAST WATER RETROFIT CAPABILITY DEMONSTRATED ON TWO 76,000 DWT PRODUCT TANKERS

The German ship owner and manager Ernst Jacob approached Goltens Green Technologies in Groningen to do detailed engineering for a 1000 m³/h NK-O3 Blue Ballast System retrofit for four of its 76,000 DWT product tankers. This was another perfect opportunity for Goltens Green Technologies to demonstrate the power and efficiency of its global capability.

3D SCANNING IN SINGAPORE

The project was to start with the Konstantin and Georg Jacob. As both vessels were to make scheduled stops at the Singapore anchorage, Goltens Green Technologies in The Netherlands arranged for Goltens Green in Singapore to complete the ship check and 3D Laser scanning. The Konstantin Jacob was scanned in December 2015, the Georg Jacob was scanned in April of 2016.

DESIGN IN THE NETHERLANDS

Concept design and detailed engineering was done in The Netherlands. The agreement was to make one design for the four sister vessels. As the NK-O3 BlueBallast System is one of the bigger and more complex ozone based ballast water treatment systems on the market, the project required thorough planning and coordination with the client, fleet manager and the equipment maker to reach the optimal design solution.

DELIVERY OF MATERIALS

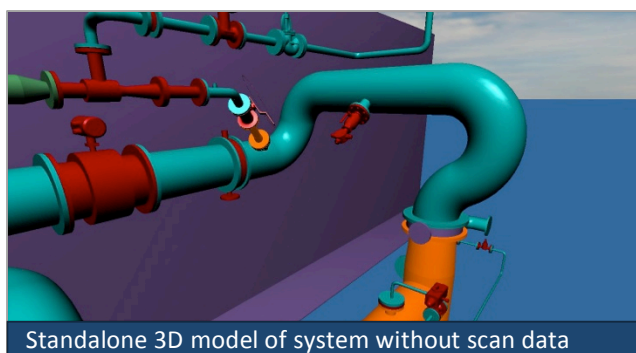
Once the design was developed and approved by the client, Goltens was requested to expand the scope of the project and complete a turnkey project for the first two vessels, scheduled for dry-docking in Malaysia. To achieve a more efficient solution for the client, all piping and foundations were prefabricated by Goltens Vietnam and shipped to Malaysia. Electrical materials were delivered directly to the vessel on the Singapore anchorage by Goltens Singapore.

RETROFIT INSTALLATION IN MALAYSIA

The major part of the installation onboard the Konstantin Jacob was performed during the 10-day dry-docking in April/May 2016 by a Vietnamese team of 17 workers and 4

PROJECT FACTS: NKO3 BWT RETROFIT

Ballast Water System:	NKO3 Blue Ballast
System Capacity:	1000 m ³ /hr
Vessel Type:	Product Tanker
Capacity:	Konstantin Jacob/Georg Jacob



specialists from Goltens Singapore. A small riding squad completed the final elements during the voyage from Malaysia to Fujairah. The whole installation was organized and supervised by a Goltens Green Technologies project manager.

In July/August 2016 the Georg Jacob went into dry-dock and the same execution formula was used but staffing levels were modified. Based on lessons learned in the first project, the size of the installation team was increased slightly so the complete retrofit was finished during the 10-day dry-dock period.

COMMISSIONING AND CLASS APPROVAL

The maker and the vessels' class society approved Goltens' design prior to execution. During the retrofit installation, NK engineers and class surveyor further verified that the installation was according to maker and class standards.

RETROFIT VIDEO

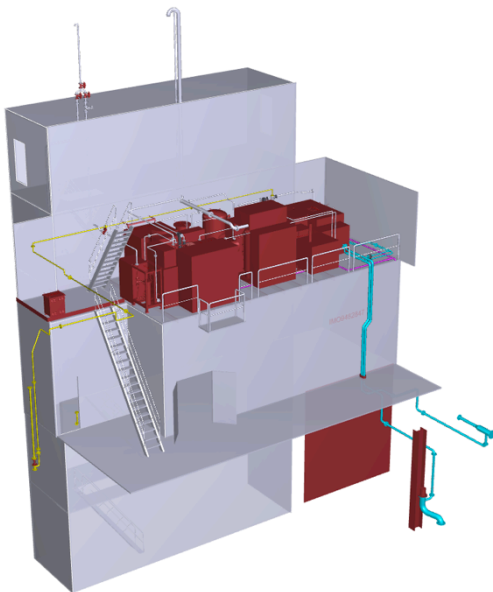
To view a video of 3D scan results and modeled system click [HTTPS://YOUTU.BE/LL55X1QSMJ0](https://youtu.be/LL55X1QSMJ0)



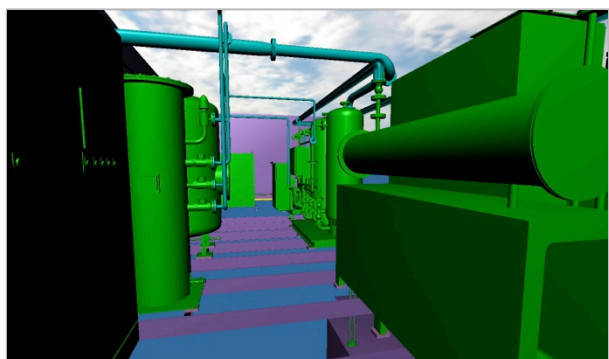
Prefab piping staged for delivery at Goltens Vietnam



Retrofit team briefing in Malaysia



3D Model of major component installation above workshop



3D Model of major component installation



Installed components according to model/design