

TECHROSS BWTS RETROFIT FOR LNG CARRIER AT SEMBAWANG SHIPYARD SINGAPORE

ANOTHER SUCCESSFUL TECHROSS BWTS INSTALLATION BY GOLTENS GREEN TECHNOLOGIES IN ASIA

Goltens Singapore was contracted by a well known LNG Ship Owner to execute 3D scanning, design engineering, material supply & installation supervision on one of their vessels. The BWTS installation comprises of one of the world's largest Ballast Water Treatment System to be installed onboard vessel to comply with IMO regulations.

DETAILED SCOPE OF WORK:

- 3D scanning & vessel survey
- Basic and Detail engineering
- Class approvals
- Procurement & Prefabrication
- Supply of Material to Shipyard (Big Bore piping, Small Bore piping, Site run Piping & fittings, Valves & Cable Drums)
- Installation supervision

TECHNICAL DESCRIPTION:

Vessel Length (LOA)	288.2m × 43.4m
Vessel DWT	83,068 T
Built Year & Yard	2004 - DSME, Korea
Gross Tonnage	97,561 T
BWTS	ECS-3,200 B x 2 Sets
Ballast Pump	3,100 m ³ /h x 3 sets

DESIGN & ENGINEERING PLANNING:

Upon contract agreement, Goltens Singapore performed 3D laser scanning with a team of proficient engineers onboard the vessel. Upon completion, the 3D scans were registered and Goltens Singapore embarked on the design engineering works with 3D modelling software. Goltens Singapore worked rigorously to develop the Engineering Design and upon approval from vessel Representatives & Class the prefabrication & procurement of materials & equipment respectively was begun.

PROJECT FACTS:

Ship Type:	LNG CARRIER VESSEL
Class:	Lloyd's Register
Ballast flow rate:	3,100m ³ X 30mTH X 3 sets
Ballast treatment system:	TECHCROSS ECS 3,200B (1,000B X2 + 600B X 2)

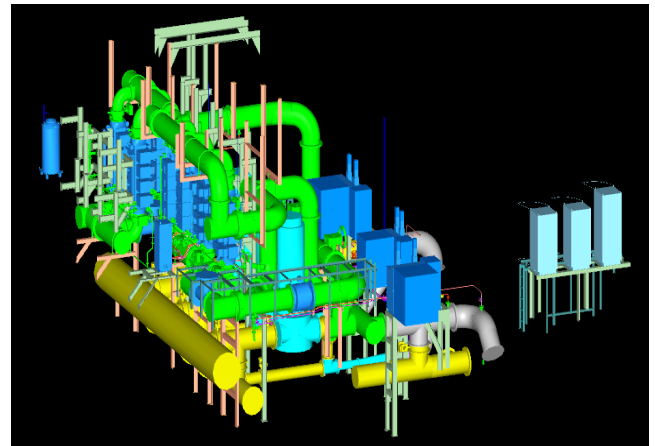


Figure 1: Techcross BWTS Design

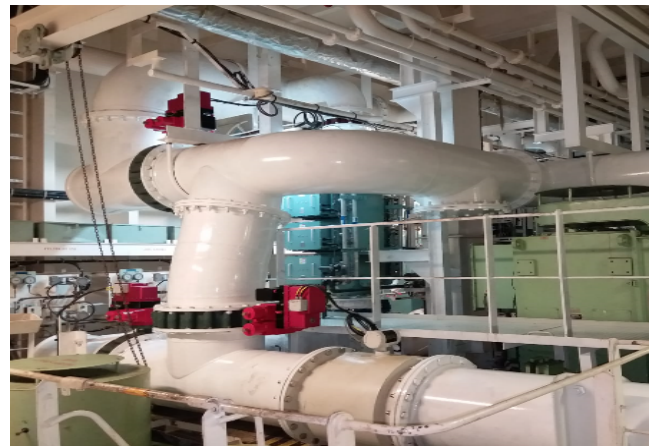


Figure 2: Installation overview of Port Side (Flow Meter & ECU 5 & 6)



Figure 3: Installation overview of Starboard Side (ECU 2 & 3)

From the outset, the primary constraint of the project was the limited size of area surrounding the ballast pumps as the Maker's (Tech Cross) equipment were both large in size and quantity. Despite these constraints, the engineering team scrutinized the designs repeatedly to ensure that the design was able to optimize the space management.

During the prefabrication phase, Goltens Singapore Team conducted numerous inspections to ensure that the quality & integrity of prefabricated pipes were up to satisfactory standards. Upon completion of pre-fabrication, Non-Destructive Testing was carried out by qualified Goltens personnel and witnessed by Vessel representatives.

INSTALLATION PHASE:

The installation was carried out by Sembawang Shipyard Contractors for a duration of 20 days & was completed successfully.

The installation phase was carried out in 5 different stages simultaneously.

- **Stage 1:** Remove the existing pipes to install the tie in spools, lift out the existing pipes (demolition) and install the newly fabricated big bore (600A) pipes.
- **Stage 2:** Fabricate & install the foundation supports for the equipment (Electro Chamber Unit, Power Distribution Equipment, Auto Neutralization Unit & TRO Sensor Unit)
- **Stage 3:** Lifting the equipment safely into the lowest deck of the Engine Room and securing the equipment.
- **Stage 4:** Completion of electrical works including: cable pulling, cable termination at main switchboards, power distribution equipment and equipment onsite.
- **Stage 5:** Installation of the small-bore piping between the equipment and big bore spools.

Over the entire installation phase, Goltens Singapore guided the shipyard contractors meticulously to ensure there were no delays to the project schedule and that it was completed on time.



Figure 4: Prefabricated Big Bore Pipe supplied by Goltens



Figure 5: Cable Drums supplied by Goltens



Figure 6: Goltens supplied valves of various sizes



Figure 7: Removal of Existing Pipes and Demolition process



Figure 8: Installation of tie in points



Figure 9: Installation of Big Bore Spools with ECUs