



LR MARINE IMPROVES ENGINEERING DESIGN EFFICIENCY WITH LASER SCANNING, 3D DESIGN & PIPE STRESS ANALYSIS

Key Facts

Company: LR Marine

Website: www.lrmarine.dk

Description: LR Marine A/S is a total supplier of cost-efficient, effective and sustainable solutions for marine and industrial applications. LR Marine's core business and primary activities are within the fields of pre-insulated pipe systems, machinery units/skids and cryogenic cargo tank insulation.

Employees: 55

Industry: Marine

Country: Denmark

Products Used:

CADWorx® Plant Professional

CAESAR II®

Key Benefits:

Ability to access as-built data no matter of the physical location.

Ability to ensure accuracy and fitting of the new equipment

IDENTIFYING GOALS

LR Marine A/S is a total supplier of cost-efficient, effective and sustainable solutions for marine and industrial applications. LR Marine's core business and primary activities are within the fields of pre-insulated pipe systems, machinery units/skids and cryogenic cargo tank insulation.

For this project, LR Marine was hired to route and install a piping connection for a VOC (volatile organic compounds) recovery system on a Norwegian crude oil tanker. The project scope included executing a laser survey on the existing vessel to ensure that the new equipment would fit into the existing piping.

OVERCOMING CHALLENGES

One of the main challenges during the project was to ensure the VOC recovery system would fit into the existing piping, and guarantee that there would be enough space available for the installation and welding.

An additional challenge was to ensure the accuracy of the design for the new equipment: the ship was located in the United Kingdom while the fabrication work took place in Northern Germany. This meant that revisiting the vessel for rechecking information would have cost LR Marine significant time, and slowed down the overall project execution.

To ensure that the new equipment would fit, LR Marine chose to execute a laser survey of the deck and the piping of the vessel with the help of a Leica Geosystems Total Station, and to use CADWorx Plant Professional for the 3D design of the new piping.

REALIZING RESULTS

First, LR Marine boarded the ship in Liverpool. LR Marine used the Leica Total



Station to 3D scan all the piping and equipment on the deck, which took only one day.

Afterwards, Leica Geosystems engineers converted the point cloud data into a readable file, which LR Marine converted into a CADWorx file (.dwg format). By using CADWorx Plant Professional, LR Marine was able to determine and create an exact and accurate design of the VOC new equipment.

The next step was to design the new piping and the connections between the existing piping and new equipment.

After fabrication was finalized, LR Marine was awarded a contract to further fabricate and insulate the new piping. The pipe spool drawings were produced based on the 3D design created in CADWorx, and this information was also used to create a cut out plan for fabrication. The new piping was installed in the FA yard at Odense, Denmark, and the installation was performed under the supervision of LR Marine.

When installing the new piping, it was not enough to have sufficient space for the piping to fit into the deck, but extra space for installation and welding was also needed. LR Marine's extensive experience on similar projects, combined with the accuracy of the designs created in CADWorx Plant Professional, enabled the company to overcome this challenge.

MOVING FORWARD

LR Marine is expecting similar types of piping connections for VOC recovery systems to be installed in the future for other similar vessels, and will be using its Leica Geosystems Total Station in combination with CADWorx Plant Professional for these projects. Soren Kjaer, sales manager at LR Marine, said "This type of combination of Leica Geosystems and CADWorx offers a unique capability to have access to as-built information anywhere in the globe. It enabled us to improve efficiency and deliver our customer high quality and accurate results in a record time."



Easily available as-built information accelerated LR Marine's project execution tremendously.



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