APPLICATION REPORT

Marine

Tank level monitoring on chemical tankers

- Complete solution for tank monitoring and alarms, incl. software system and instrumentation for level, pressure and temperature measurement
- Radar based cargo tank level gauging
- Comprehensive project management from engineering to commissioning

REDERIET STENERSEN AS

1. Background

Norwegian ship-owner Rederiet Stenersen AS specialises in chemical tanker transport. The company operates a fleet of 16 purpose-built chemical carriers, including the most modern tankers MT Sten Odin and the MT Sten Tor. Both feature a capacity of 17,500 dwt and are the first tankers to be driven by hybrid electric propulsion.

2. Measurement requirements

Operators of marine vessels depend on reliable and accurate data and alarms from tank monitoring systems on board to maintain ship stability and safety. Malfunctions in monitoring systems can result in costly delays and bring operations to a halt if redundancies are not available. Given their critical loading and unloading operations, a full overview of cargo tanks on board Sten Tor and Sten Odin is vital to Rederiet Stenersen.

3. KROHNE solution

The ship-owner and the Chinese shipyard decided to go for KROHNE system delivery with well-proven marine solutions. Deciding factors were previous experience with KROHNE as manufacturer and their extensive references, providing instruments and measurement solutions to the marine industry since 1957.

KROHNE delivered a complete marine solution based on the CARGOMASTER® system. The dedicated onboard tank monitoring and alarm system for seagoing vessels included the system software as well as instrumentation, adapted to the individual vessel applications of Stenersen. Marine approved workstation equipped with CARGOMASTER® software was mounted in the cargo control room (CCR). The tank monitoring system utilizes the readings from tanks, drafts and manifolds to display ullage/levels, volume, pressures, temperatures, loading/unloading rates, alarms and provides critical data to the ship's loading computer.

KROHNE

The implementation of CARGOMASTER® involved a comprehensive project management from engineering to documentation and commissioning. In cargo tanks KROHNE supplied the OPTIWAVE 8300 C, a robust 24 GHz radar level transmitter for non-contact level measurement of chemicals and other liquid cargo. An electro-pneumatic level gauging system provides level data for drafts, ballast, fuel and service tanks to CARGOMASTER®.
In addition to vessel tank level monitoring CARGOMASTER® is also used to monitor inert gas pressures, temperatures, bilge switches in void spaces and pump and manifold pressures. In accordance with class regulations KROHNE also supplied independent high level and overfill alarm systems, including fixed length level switches for all cargo/slop tanks. All instrumentation from KROHNE was provided with DNV GL marine approvals. Monitoring points include:

- 15 x Monitoring of level (with OPTIWAVE 8300), inert gas pressure (with P-130 pressure sensor) and temperature (three positions) in cargo and slop tanks
- 35 x Pump and manifold pressure monitoring with P-140 pressure sensor
- 51 x Electro-pneumatic level gauging for draft, ballast HFO, MDO, FW, heeling tanks and cylinder oil
- 27 x Temperature monitoring in cargo, fuel, ballast water lines and fuel tanks
- 16 x Digital input for yard supplied bilge switches
- 2 x Independent high level (95%) and overfill (98%) alarm systems
- 30 x Level switches for high level and overfill alarm

4. Customer benefits

Rederiet Stenersen benefits from a reliable and well-proven tank monitoring solution. The configurable graphical display of tank contents and cargo operations provides a user-friendly overview for the operator.
Self-calibration, built-in auto-diagnostics, audible alarm, UPS and redundant local cargo tank radar ullage display add a further layer of safety that greatly reduces risk of interruptions in loading/unloading operations. Additional unique features are closed tank cleaning of radar antenna and the possibility to replace the calibrated part of the cargo radar without opening the tank.
Good serviceability on instruments, high level of technical support and an extensive worldwide service network are qualities valued by KROHNE customers.


CCR monitor

5. Products used

CARGOMASTER®

- On-board tank monitoring and alarm system for seagoing vessels
- Complete solution with application-specific software on marine computers
- Integrated valve & pump management and control system
- Extensive reporting, data export functions; configurable alarms

OPTIWAVE 8300 C

- 24 GHz FMCW cargo level radar for liquids in the marine industry
- Rugged stainless steel (1.4404 / 316L) housing and display protection
- Integrated ball valve flushing connection for radar antenna cleaning

P-130

- SS317/316L (optional titanium) pressure sensor for IGP reading, deck mounting, high corrosion resistance, IP68

P-140

- SS316L/ceramic pressure sensor for manifold and pump pressures, deck mounting, IP 68

Contact
Would you like further information about these or other applications?
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