



# APPLICATION REPORT

Marine

## Fuel consumption and emission monitoring on a hospital ship

- Reliable consumption data of main engines and generators
- Emission monitoring in compliance with EU and IMO regulations
- Full service package from monitoring system and flowmeters to implementation, support and integration into cloud services



### 1. Background

The international charity Mercy Ships operates the world's largest civilian hospital ship "Africa Mercy". The "floating" hospital provides free surgeries and healthcare to people with little or no access to healthcare in Africa. First-rate medical care is provided by a crew of 400 volunteers from around the world.

### 2. Measurement requirements

Fuel consumption monitoring of the ship's main engines and generators is crucial to the organisation's effort to increase energy efficiency and to reduce emissions. Ciaran Holden, Engineering Superintendent at the Africa Mercy, was searching for a monitoring solution that allowed the charity to comply with EU MRV and IMO regulations to monitor, report and verify the vessel's emissions in terms of CO<sub>2</sub>.

### 3. KROHNE solution

KROHNE provided the EcoMATE™ fuel consumption and carbon emission monitoring system in combination with 6 OPTIMASS 1010 Coriolis mass flowmeters. The twin straight tube flowmeters (size DN15, made from stainless steel) were installed in the supply lines to the two main engines and the generators as well as the corresponding return lines.

All readings are transferred via Modbus to the EcoMATE™ system that uses the mass, density and temperature measurements of the flowmeters. In this way, EcoMATE™ enables on-board monitoring and reporting of fuel consumption, providing key emission data in accordance with EU MRV and IMO requirements. In addition, all actual readings are made available via the EcoMATE™ Cloud module to allow monitoring and analysis of consumption data at remote onshore stations. KROHNE also supplied all other necessary components such as a marine approved computer with 23" monitor, a 12" bridge panel computer for bridge mounting as well as equipment for power supply and printers for reports.

**KROHNE**

## 4. Customer benefits

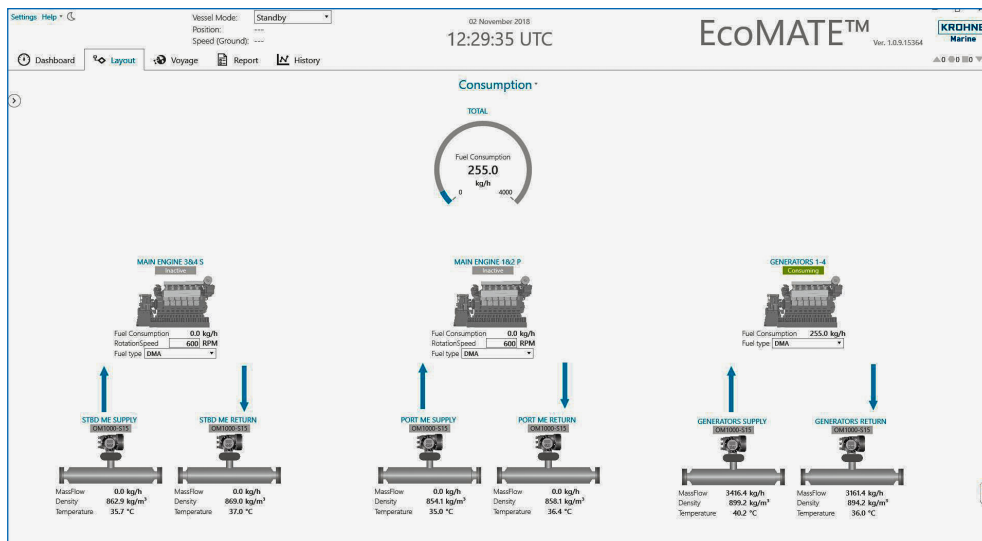
The combined solution of EcoMATE™ and OPTIMASS 1010 flowmeters provides Mercy Ships with accurate daily, weekly and monthly consumption data on board. The fuel consumption of all main engines and generators can be reliably monitored, helping the charity take steps to optimise fuel consumption and reduce emissions.

EcoMATE™ also guarantees that EU and IMO's mandatory regulations on the monitoring, reporting and verification (MRV) of carbon dioxide emissions are fully met. Using the EcoMATE™ Cloud module allows the customer to automatically send their consumption data to a cloud solution, enabling on-shore staff to monitor ship specific fuel usage or voyage reports.



OPTIMASS 1010 flowmeter on board Africa Mercy

As a single source supplier, KROHNE managed the whole project. The full service package involved engineering (incl. drawings and documentation), the adaptation of EcoMATE™ functionality to the individual ship applications as well as commissioning of the solution (incl. installation of flowmeters).



Comprehensive overview of fuel consumption on board provided by EcoMATE™



Flow measurement with OPTIMASS 1010

## 5. Products used

### EcoMATE™

- Fuel consumption and carbon emission monitoring system for ships
- Cloud functionality for remote data transfer to onshore stations
- MRV compliant and verified acc. to EU regulation 2015/75

### OPTIMASS 1010

- Twin straight tube Coriolis mass flowmeter for fuel consumption measurement
- Integrated Modbus: No separate converter, communication direct from meter
- Various Marine approvals (DNV GL etc.)



### Contact

Would you like further information about these or other applications?  
Do you require technical advice for your application?  
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Please visit our website for a current list of all KROHNE contacts and addresses.

