



## **APPLICATION SPOTLIGHT**

TRICOR Coriolis Mass Flow Meters Optimize Marine Vessel Fuel Consumption



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### APPLICATION:

Pemex (Mexican state-owned petroleum company) contracted Marinsa de Mexico, a marine services company, to build a Platform Supply Vessel to transport materials and supplies to/from oil platforms. Pemex specified a fuel monitoring system for the offshore vessel to accurately track and report fuel usage.

Flow meters are important components of the fuel monitoring system. Flow meters operating at several points along the fuel supply and return lines provide accurate measurement of incoming fuels and their usage by different engines. Accurate measurement is imperative, so operators can precisely monitor fuel consumption and engine performance, analyze vessel performance, submit voyage reports with correct data and optimize fuel consumption for future cost savings.

### PRODUCT SUPPLIED:

- TCM 5500 Coriolis flow meter: monitors fuel usage at both the main and auxiliary engines
- TCM 7900 Coriolis flow meter: monitors fuel usage at auxiliary engine
- TCM 230K Coriolis flow meter: monitors fuel onboarding to tank(s) and offloading to other vessels within the fleet
- TCE 8000 Coriolis Transmitter: transfers data in Modbus format from mass flow meters to control room

### CHALLENGE:

Flow meters must provide accurate and repeatable flow measurement unaffected by changing temperatures and pressures along the fuel line. Flow meter output must provide feedback on different data points, so operators can make appropriate fuel usage calculations.

### SOLUTION:

The fuel monitoring system incorporated Coriolis TRICOR Mass Flow Meters to ensure the highest fuel measurement accuracy and most reliable/repeatable feedback. Unlike volume, the mass of a fluid is unaffected by changes in temperature and pressure. Thus, the TRICOR Coriolis Mass Flow Meters used for measuring mass flow is ideal for providing flow measurement outputs.

Three models of TRICOR Coriolis Mass (TCM) Flow Meters measure the flow of diesel at different points along the fuel line depending on flow rates, pressures, and line sizes. Installed at the main line coming into the ship storage tanks, TCM 230K Flow Meters measure the total supply of diesel fuel pumped onboard from a bunkering station. The TCM 230K also measures fuel offloaded to ships as needed by the fleet.

Smaller TCM 5500 and TCM 7900 Mass Flow Meters measure fuel consumption along supply and return lines at two main engines and four auxiliary engines. In operation, fuel circulates



## Flow Management and Reporting Solution Automates EPA Compliance of VOC Emissions

through a looping system with engines taking necessary fuel and the remainder flowing back into the system.

Flow data from meters is output in Modbus format and sent from the engine room by a TCE 8000 Coriolis Transmitter to the control room. Centralized displays reduce operator workload and streamline workflow processes by enabling operators to monitor different data points on a custom dashboard such as flow rate, flow total, temperature, density, pressure.

As a combined mass flow and density meter, the TRICOR Coriolis Mass Flow Meters provide both direct, independent mass flow and density measurement for fuel quality control. Compared to volume-based flow meters, the TCM Flow Meters have no moving parts that wear and require no upstream or downstream piping. The Mass Flow Meters offer excellent repeatability ( $\pm 0.05\%$  of flow rate) and mass flow accuracy ( $\pm 0.1\%$  of flow rate) to optimize engine processes in better monitoring and controlling fuel consumption.

