



**SIEMENS**

# Coriolis flow meter solves critical fuel measurement concerns on the high seas.

## Process Instrumentation

### Challenge

There has been a growing need in the marine industry for accurate flow measurement of fuel aboard ships. This requirement has come about due to the increased focus on fuel utilization and fuel security. The primary concern has been the security of the fuel stored on the ships, which at times can be misdirected for illicit purposes. Additional uses are in maintaining drive and generator engine performance records of fuel utilization, when the ships are at sea or at dock.

One customer stated that they have millions of US dollars' worth of fuel aboard the ships at sea at any given time, and all of that fuel is completely unaccounted for. They needed a way to accurately measure the fuel's utilization and measure

the fuels quality while at the same time preventing tampering with the fuel systems. They also required a solution that was compact to fit into areas where space was limited.

### Solution

After discussions with the customer it was determined that the Siemens FC410 Coriolis flow meter would be the optimal solution to meet their needs. The FC410 comes with ModBus I/O which affords the customer easy integration into their PLCs'. Modbus also provides a very quick responding system that allows easy access to a host of critical process data points that can be stored for history or evaluated in real time. Siemens Coriolis solution is the world's smallest Coriolis sensor in the utilized tube size. The small size easily addressed the difficult installation requirements.

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The customer not only required flowrate accuracy they also required density and temperature accuracy as well in order to properly ascertain the quality and makeup of the fuel. The Coriolis flow meters also needed to have very low pressure loss within the fuel delivery system in order to avoid fuel starvation which could result in catastrophic engine failure. The Siemens FC410 has one of the lowest pressure losses for a flow meter of its size.

The FC410 also had to meet stringent delivery requirements to meet the critical build schedule. Delivery had to be made within two weeks of the order being entered. With Siemens customer tailored local inventory, the customer was able to easily meet their delivery requirements.

Finally since the ships are utilized worldwide the customer required that field service be available on the Coriolis flow sensors anywhere when the ships were in port. With Siemens worldwide presence and technical support team, service was available for all the ships when in port.

### About the FC410 Coriolis flow meter

#### Digital technology

The SITRANS FC410 provides superior digital interface and communication technology. Reduced interference is assured because each process signal is immediately digitized. Internal high-speed signal processing provides fast and reliable process parameters, which are provided on the output side with a refresh rate of 100 Hz.

#### Extremely compact

One of the most compact flow meters on the market, the SITRANS FC410 enables space and money-saving installation in any position. The world's shortest installation length allows multiple devices to be installed in the tightest of spaces. The simple wiring enables safe and time-efficient installation.

#### Excellent measuring results

With a mass flow rate accuracy of 0.1% and a maximum reproducibility error of 0.05%, the SITRANS FC410 meets the most stringent accuracy requirements. Additionally the highly accurate real time density measurement accuracy of 1 kg/m<sup>3</sup> greatly benefited the customer in maintaining the fuel composition. This performance makes the SITRANS FC410 perfect for use in these ship board applications.

#### Comprehensive system certification

The SITRANS FC410 is certified by ABS (American Bureau of Shipping). This is a guarantee of unsurpassed safety and reliability in Marine applications. The SITRANS FC410 is also FM certified and can be used in hazardous areas up to Class 1 Division 1.

#### Unrivaled user-friendliness

The SITRANS FC410 is operated directly via the Modbus interface. There is easy access to wide variety of data that can be utilized to meet the customers' needs.

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