



## APPLICATION NOTE Power Industry

### Measuring Heavy Fuel Oil consumption at a power station

- Replacement of high-maintenance turbine meters
- Measuring the feed line and return line allows for evaluation of efficiency
- Leak checking in the system

#### 1. Background

A power generation company in the UK operates a coal-fired power station. Although the four boilers at the station run predominantly on coal, Heavy Fuel Oil (HFO) is used during the startup phase to get the boilers to optimum operating temperature, or for short-duration operation of the boilers during peak demand.

#### 2. Measurement requirements

For measuring the consumption of HFO on each boiler, the company had turbine meters installed. To maintain accuracy, these meters needed to be serviced regularly due to deposits and dirt on the turbine blades, causing significant maintenance costs. Therefore, the company was looking for an alternative flow measurement solution to be operated at much lower cost.

**Application Data:**

Medium: Heavy Fuel Oil  
Temperature: 100 ... 140 °C

Flow rate: 10 ... 80 kg/sec  
Density: 900 ... 930 kg/m<sup>3</sup>

Viscosity: 450 ... 600 cSt

#### 3. KROHNE Solution

KROHNE delivered 8 Coriolis-Mass flow meters OPTIMASS 7300F T80. Nominal size of these meters is DN 80/ 30" with a single straight measuring tube made of titanium. Replacing the turbine meters, the coriolis meters were installed in pairs on each boiler, one measuring the flow to the boiler and the other measuring the return flow of unused oil.

## 4. Customer advantages

The accurate measurement allows the operators to monitor the usage of HFO closely and precisely and to evaluate the efficiency of the plant. When the HFO is not being burnt, it is continuously recirculated. Being installed in pairs, the meters can be used as a cross-check to each other and also to check for leaks in the system.

OPTIMASS coriolis meters directly measure mass flow rate of the HFO. The titanium version was chosen due to its high accuracy and temperature range. A standard feature of OPTIMASS 7000 is that the meters are calibrated at 3 different temperatures to compensate influences of temperature changes on the measurement. A certified secondary containment (pressure rating 100 bar / 1450 PSI) ensures safety of the devices as they are installed in a high pressure line.

As they have no moving parts to be serviced or adjusted, the OPTIMASS meters reduce maintenance effort to zero. Being a straight tube with no inserts, pressure drop is very low compared to the turbine meters and thus pump capacity can be reduced, thus saving costs.

Due to the location of the sensors and for a convenient read-out on-site, converters were mounted separately. Customer also made use of the free 3 year extended warranty which ensures total support from KROHNE. This was a decisive factor to use OPTIMASS as the manufacturer could ensure long-term reliability of the devices.



Converters mounted separately

## 5. Products used

### OPTIMASS 7300

- Single straight tube meter with low pressure drop
- High safety with standard pressure rating 100 bar/1450 PSI and PED approved secondary containment
- No installation restrictions; straight upstream and downstream sections are not required
- All common approvals available
- Remote electronics suitable for installation up to 300m from the sensor



## Contact

Please visit our website for a current list of all KROHNE contacts and addresses.



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