

# Flare gas vent monitoring



## Oil and Gas Case Study 202-6

### Application

A major oil company was in search of an advanced flow meter to provide an accurate gas flow measurement reading on a vapor header line from their loading and unloading station on a wharf in Mississippi. FCI's successful history of providing state-of-the-art thermal mass flow meters for measuring the flow of mixed composition gases made FCI the leading candidate to solve this vapor mass flow measurement problem.

### Challenge

Incorrect vapor flow rate measurements can cause an improper mix of gases or even non-combustion in the incinerator. If an improper mix occurs, the risk of releasing dangerous and toxic vapors into the environment increases. If non-combustion occurs, in addition to the possibility of emitting dangerous toxins, there also is the risk of having to perform costly emergency plant shutdowns. Because of the vent's vapor density variation, the company operators knew that

mass (rather than volumetric) flow rate was the measurement parameter of interest. However, accurately measuring vapors with varying compositions required the abilities of a sophisticated flow transmitter.

### Project parameters

User	Oil & gas company
Location	Mississippi, USA
Media	Paraxylene, benzene and gas vapors
Flow Range	0.5 to 150 SCFM [0.8 to 240 NCMH]
Pressure Range	0 to 50 psig [0 to 3.4 bar(g)]
Temperature Range	68° to 149°F [20° to 65°C]

### Solution

FCI's GF90 thermal mass flow meter is the perfect solution to problems associated with measuring varying composition vapor gases. In this case the GF90 is able to accept a process input signal from a densitometer

and select a flow calibration curve that matches the vapor composition. For example, this application uses densitometer cutovers at 35, 50, and 75 percent. At these cutovers the GF90 automatically changes to a flow calibration curve appropriate to the composition. This offers the customer essentially three different calibrated flow meters with one pipe penetration. By accommodating the flow curves, the proper amount of natural gas can be added to the vent gas to achieve optimal incineration.

The accuracy of the GF90's mass flow measurement capabilities can be further improved with the VORTAB® flow conditioner. VORTAB flow conditioners are the in-line, low pressure loss solution to flow profile irregularities that occur in pipe and duct runs. A VORTAB enhances flow meter accuracy and repeatability by eliminating gas flow swirl, velocity profile distortions and temperature/media stratification produced by process equipment obstruction and/or inadequate straight run of pipe and ducting.

### FCI flow meter specifications

Model	GF90 mass flow meter with VORTAB flow conditioner
Media	Gas mixture
Flow Range	0.25 to 1600 SFPS [0.08 to 488 NMPS]
Pressure Range	to 1000 psig [69 bar(g)]
Temperature Range	-100° to +850°F [-73° to +454°C]

### Your local FCI representative:



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FCI is ISO 9001 certified/conformance to AS9000