Micro Motion® ELITE® Meters Improve Performance of LNG Dispensers

**BENEFITS**

- Reduced filling time at fueling station
- Storage requirements of only one liquefied natural gas (LNG) tank instead of 4–5 CNG cylinders.
- Improved safety for vehicles and the fueling station

**APPLICATION**

A major engineering test laboratory specializes in testing and measuring compressor efficiency. This requires testing gas and liquid applications over a wide range of temperature and pressure conditions. Some of the extreme conditions can lead to two-phase flow and process upsets. To maintain test accuracy, flowmeters must be checked both at regular intervals and whenever the accuracy of the device is questioned.

**CHALLENGE**

LNG is a cryogenic liquid (–163 °C) and is difficult to measure accurately with a system other than a mass flow meter. Two-phase flow is common with LNG, which makes the 4–20 mA or pulse output of traditional volumetric meters hard to interpret. This means the status of the LNG in the dispenser tubes may be unknown, creating a safety hazard.

Furthermore, many traditional LNG measurement techniques require a separate density and temperature measurement. This method is not considered to be sufficiently accurate or sufficiently safe for LNG dispenser applications. Because of the low flash point and cryogenic state of LNG, it is difficult to get a safe, accurate measurement with three separate devices, especially if any of the measurements need to be taken off-line (e.g., sampling).

**SOLUTION**

Using a Coriolis meter for LNG dispensing provides operators with accurate, real-time, in-line measurement data. A single device can supply flow rate, density, and temperature information. This allows operators to monitor LNG state during filling without the need for separate devices or off-line sampling.
operators to monitor LNG phases during dispensing, without the need for separate devices or off-line sampling.

Micro Motion produces Coriolis meters that are designed to meet the harsh conditions of cryogenic liquids such as LNG. In addition, Micro Motion Smart Meter Verification uniquely allows Micro Motion Coriolis meters to self-validate the condition of their own flow tubes, which greatly increases operator safety.

Coriolis meters also provide solutions to LNG vapor handling. LNG vapor can be measured easily by a Coriolis meter when it is present during dispenser start up. Furthermore, Coriolis meters are able to detect when vapor is present in the line. This detection can be used to activate a recycling pump. A second Coriolis meter can be used to measure vapor flowing back into the system during filling, ensuring an accurate totals and maintaining LNG pressure at appropriate levels.