Application Description

For transport and delivery, natural gas is compressed, cooled, and liquefied in order to reduce volume. The volume of the LNG (Liquefied Natural Gas) is over six hundred times lower than for natural gas in its normal state. In order to achieve this, the gas is compressed by cooling to a temperature of -164°C under atmospheric pressure, which is the natural boiling point in its liquid state. Boiled off gasses are then recompressed, cooled, and returned to this cryogenic liquid. For efficient stock management and control of the storage, LNG vessels are equipped with level measurement systems. However, because of the very low temperatures and density, the technological choices are generally limited to mechanical measurement systems.

Process Characteristics

- Product: LNG (Liquefied Natural Gas)
- Vessel: Horizontal steel cylinder
- Temperature: -164°C (-263°F)
- Pressure: Atmospheric

The Solution

It is possible to avoid using mechanical parts and the necessary maintenance that comes along with them by using a guided wave radar. A guided wave radar in a “low temperature” version allows measurement in conditions down to -200°C, even working with liquid gases that have a low dielectric constant (the main characteristic for the reflection of the microwaves on a liquid). They are equipped with a coaxial antenna, serving as wave guide, which gives the sensor optimal reception sensitivity to follow the level with a high reliability.

This solution also applies to measurement of other liquid gases such as propellants. It is also applicable on processes under extreme operating conditions: -200°C to 400°C and -1 to 400 bar.

The Advantages

- Simple setup expedites installation
- Low temperature tolerances provides measurement down to -200°C
- Measurement precision of +/- 3 mm ensures reliable monitoring
- Continuous, online tracking maximizes operator control
- No mechanical parts reduces maintenance requirements