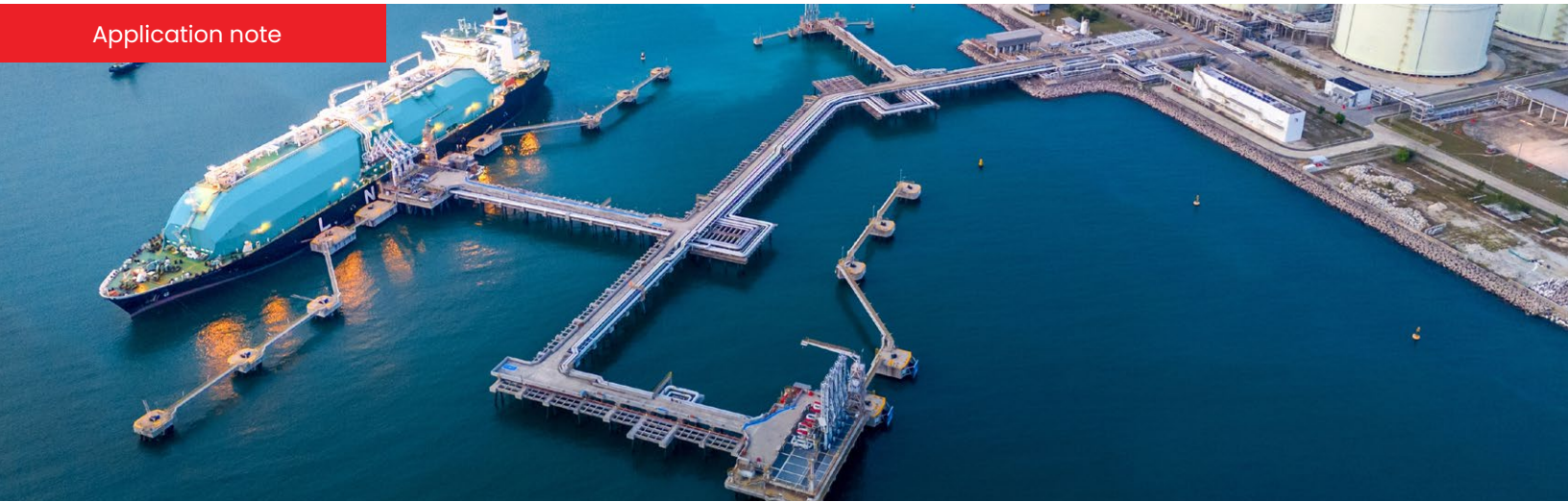


Application note



Panametrics helps LNG terminal strengthen transfer measurement accuracy

Proven ultrasonic flowmeter solution provides independent cross-check capability for vessel tank-gauge billing

Summary

To support growing regional LNG demand, a Benelux LNG terminal expanded its capacity with a new 180,000m³ storage tank and a 36-inch LNG transfer line, enhancing vessel unloading capabilities and strengthening its position for future growth. As part of the project, the operator required a reliable flow measurement solution to accurately monitor LNG transfer through the large-diameter line and provide an independent cross check against the LNG vessel tank gauge billing.

Application

Medium:	LNG unloading
Pipe size and thickness:	36" Sch. STD (DN 900, 9.52 mm)
Pipe material:	Stainless Steel 304/304L
Pressure:	3.63 PSIG (~0.25 barg)
Flow rate:	0-2353 CFM (0-4000 m ³ /h)
Temperature:	-274°F (-170°C)
Requested accuracy:	<1%

Benefits:

- Reliability
- No pressure drop
- Bidirectional measurement
- Strong local support
- Non-disruptive maintenance
- Accuracy
- All welded construction, zero leak



Fig. 1: XMT1000 transmitter

Challenges

Measuring LNG is particularly challenging due to its cryogenic temperatures, which push many flow measurement technologies beyond their operating limits. As a result, numerous conventional solutions are unable to provide reliable performance in these demanding conditions.

The application was further complicated by the need to avoid any pressure loss in the line. At the low operating pressures typical of LNG transfer systems, even small pressure drops can increase the risk of partial vaporization, directly impacting process efficiency and measurement accuracy.

Adding to these challenges, the line diameter was 36 inches, requiring ultrasonic signals to travel an exceptionally long path through the process fluid. This demanded highly capable transducers and advanced signal processing to ensure reliable measurement performance.

Solution

The selected solution consisted of a single Panametrics XMT1000 transmitter paired with four BWT transducers and FWPA buffers, configured as a dual-path meter in a mid-radius, cross-path arrangement.

The system's all-welded construction with retractable BWT transducers provides a zero-leak design, a key advantage in LNG applications where preventing methane emissions is critical for both environmental compliance and product conservation.

In addition, the ultrasonic measurement principle introduces no pressure drop, eliminating any risk of LNG vaporization caused by flow restrictions. Following calibration, the system delivers a measurement uncertainty better than $\pm 0.5\%$, ensuring accurate and reliable operational measurements and cross check capabilities from the LNG carrier tank gauges.

The solution was successfully commissioned and met the operator's requirements for accurate, reliable LNG transfer measurement without introducing pressure loss into the line. With Panametrics flowmeters already measuring LNG transfer from vessels to the facility's three existing storage tanks for 15 years, the customer had confidence in the technology's proven performance and was satisfied that the new system provided the independent cross-check needed to support vessel billing verification.

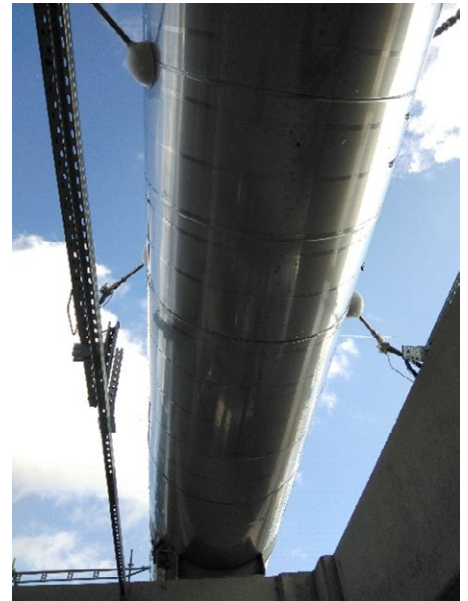


Fig. 2 and 3: LNG flowmeter with FWPA+BWT transducers