



Empowering FSRU Operations:

Reliable LNG Flow Measurement from Panametrics Drives Customer Success

Summary

An FSRU (Floating Storage Regasification Unit) permanently moored on the Southern Eastern coast of Europe serves as a supply point for natural gas to regional grids in several countries.

The FSRU has an annual LNG capacity of 2.9 billion m³, which is currently being expanded to 6.1 billion m³.

Once regasified, LNG occupies about 600 times more volume than in its liquid phase.

The current natural gas flow rate is approximately 250,000 m³/h.

Application

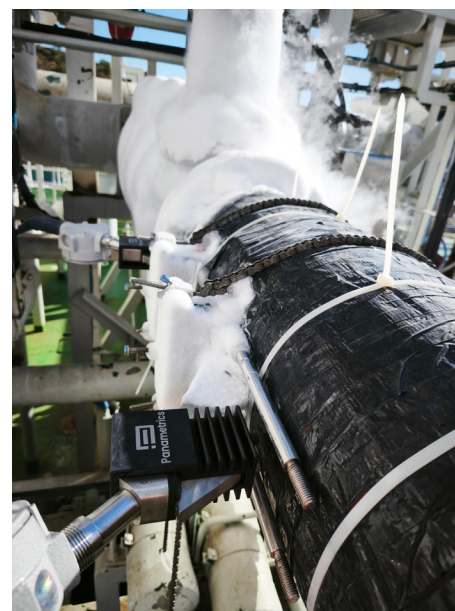
Medium:	LNG
Pipe size and thickness:	219.1 x 3.76 mm (8"x0.15")
Pipe material:	SS316
Flow rate:	unidirectional 45 to 577 m ³ /h (198 to 2540 GPM)
Temperature:	-159.8°C (-255.6°F)
Requested accuracy:	< ±2% of reading

Challenges

Measuring LNG presents significant challenges, primarily due to the extremely low temperature in cryogenic applications. These challenges are further compounded on existing vessels like FRSUs or FLNG, where the installation of inline meters is not feasible when in operation. As a result, clamp-on technology becomes the only practical solution for evaluating pump efficiency in such environments.

Benefits:

- Easy to set up and program
- No process interruption
- Reliability
- Extreme versatility
- Expertise and competence



C-ET transducers after installation. Insulation thickness has been properly adjusted to ensure good thermal dissipation

Additional challenges arise when the available straight pipe runs are insufficient to achieve a fully developed flow profile, further complicating accurate measurement. To address these issues, it is essential that installation is carried out by an experienced specialist, who can ensure proper setup and prevent ice formation at the transducer-pipe interface, thereby safeguarding measurement reliability.

Solution

With the FRSU customer determined to overcome these issues and benefit from accurate LNG measurements, it turned to Panametrics.

The team selected the XMT1000LC liquid clamp-on flowmeter with C-ET transducers, specifically designed for extreme temperatures, in a single-channel dual traverse configuration.

This setup successfully validated the theoretical pump curve model through the flow and pressure measurements.

The customer was very satisfied with the solution... so much so that they subsequently applied the same configuration to measure heating water on a different line, where the heat exchanger had been underperforming, and no flow measurement was previously available. Leveraging the XMT1000LC readings, the team adjusted the flow rate, resulting in optimal, heat transfer performance.



C-ET transducers installed on the heating water line



XMT1000LC liquid clamp-on transmitter