

Flare Gas Flow Measurement Survey using CTF878

Abstract

Clamp on flow technology and low pressure gas. You would be wrong in thinking that this is impossible. Quite the reverse. Universally there is only flow meter that can measure natural gas based applications below 10 bar: the CTF878.

Equipment Used

The Panametrics CTF878 Ultrasonic Flow Meter

Flow - Level - Water Quality
Groundwater - Meteorology - Telemetry



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Background

Clamp on flow technology and low pressure gas. You would be wrong in thinking that this is impossible. Quite the reverse. Universally there is only flow meter that can measure natural gas based applications below 10 bar: the CTF878. RS Hydro recently installed several Panametrics CTF878 flow on flare lines and compressor gas lines with pressures as low as 1.02 barg. This project involved RS Hydro engineers and CTF878 ultrasonic flow meters offshore (North Sea) to measure 16" and 24" flare lines. Although this is not the preferred method for measuring flare lines, the non invasive flow meters were used as a short- to medium-term solution for monitoring flare gas emissions. The main reasons for monitoring flare gas are to comply with international regulations, identifying leaks, and flare burner control.



fig1. Oil platform in the North Sea.

RS Hydro were contracted by one of the main oil companies operating out of Aberdeen (UK) to install two semi-temporary flow meters on an offshore platform in the North Sea. To our knowledge this is the first time that this has been done offshore. RS Hydro engineers were responsible for installing the flow meters in Zone 1 locations and providing analogue signals for flow monitoring, in water quality.

Installation

Like any flow meter, ultrasonic flow meters must be sited in an appropriate location away from bends and valves, just like any other type of flow meter. The CTF878 flow meters required 25 diameters of

straight pipe upstream and 10 diameters downstream. The 24" flare line only had a total of 22 diameters and as such was installed using the 2/3rd 1/3rd rule.

The CTF878 involves two pairs of clamp on transducers positioned diagonally opposite each other. The measured signal response pattern is compared between the two pairs of ultrasonic transducers and correlated to provide a transit time for the signal pattern to pass from the first pair of transducers to the second, otherwise known as 'delta t' or 'transit time.'

Each of the flow transmitter displays were installed within safe confines of the local control room but connected to the transducers using 60 meter armoured cables via pipe tracks. Both flow meters were installed within 24 hours and provided logged flow data that was recorded by the flow meter and also relayed via two analogue 4-20mA signal outputs.

Finally....

The CTF878 can be used for many applications where velocities are typically 1-46m/sec and are within the 4-30" diameter range. The CTF878 is a truly unique flow meter that enables users to monitor gas flows at low pressure without interrupting the process to install instrumentation. RS Hydro are specialists in clamp on gas flow measurement and provide a comprehensive sales, rental and installation service worldwide, onshore or offshore.



fig2. Oil platform in the North Sea.