App Note - Refinery

Heavy residue measurement using clamp on in a refinery

TransPort PT900 with C-ET transducers does the job!

Problem

A refinery in East Europe required a flow measurement for heavy residue without interrupting the flow on six of their lines at their hydrocracker processing unit.

Application: Vacuum residue

- Number of lines: 2
- Pipe: 6" Sch STD (7.112mm)
- Temperature: 140°C – 180°C (608°F – 716°F)
- Pressure: 500 kPa (72 psi)
- Density: 980 – 1,100 kg/m^3 at 20°C

There are two lines with the same characteristics, neither with a permanent meter installed.

Application: Furnace feed

- Number of lines: 4
- Pipe: 4" Sch XS (8.56mm)
- Temperature: 360°C – 380°C (608°F – 716°F)
- Pressure: 380 to 450 kPa (55 to 65 psi)
- Density: 950 kg/m^3 at 20°C

There are four lines with the same characteristics and orifice plates are installed as permanent meter.

The operator required validation that our technology was capable of monitoring these difficult applications with a true flow measurement indication.

Solution

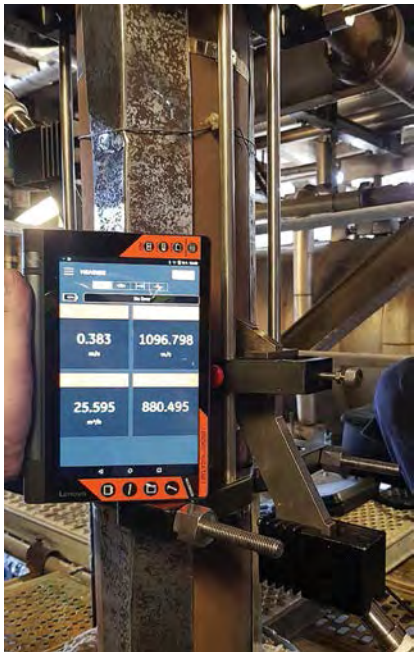
For the first two vacuum residue lines, our channel partner used our Transport PT900 with C-ET transducers and PT878 with C-RS transducers. The results from both meters were compared and met the end users expectation with respect to both accuracy and repeatability. They both had soundspeeds of ~1100 m/s (~3600 ft/s) at 180°C (356°F) which was expected.

The 4" furnace feed lines with very high temperatures were more challenging due to the piping congestion as well as the high ambient temperatures. They used our PT900 with the C-ET transducers and the measurements matched the existing orifice plates from their DCS system. The soundspeed of ~765 m/s (~2500 ft/s) at ~380oC (~715°F) was reasonable for the process fluid.

Overall, all six lines were successfully measured with the portable TransPort PT900 ultrasonic flowmeter. The end user purchased the flowmeter after the demonstration.

Benefit

No expensive or disruptive process shutdown was required to obtain a reliable flow measurement. With external mounting, there was no risk of hazardous leakage for safe operation. Additionally, the complete system provided a low operational expenditure.



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