APPLICATION REPORT

Oil & Gas

Monitoring leaks in a multi-product pipeline

- 31.5 km / 19.6 miles long, bi-directional pipeline for liquid hydrocarbons
- Redundant, independent monitoring system as per TRFL (Germany)
- Integration into existing instrumentation and control system
- Reliable monitoring with an extremely low false alarm rate since 2006

RAFFINERIE HEIDE
Voller Energie für den Norden

1. Background

The Heide refinery in Hemmingstedt, Germany, processes 4.5 million tonnes of crude oil per year into finished products and feedstocks for the chemical industry among others. The plant produces not only benzine, diesel and heating oil but also turbine fuel and heavy crude oil for ships.

2. Measurement requirements

A 31.5 km / 19.6 miles long multi-product pipeline connects the refinery to the Brunsbüttel tank farm. At the end of 2005, in order to comply with TRFL requirements, the Heide refinery looked for a second independent system to monitor for leaks in the pipeline. The pipeline transports middle distillates in both directions; a total of 9 different, refined liquid hydrocarbons. The products feature different densities and viscosities and are transported directly after one another, creating the possibility of mixed phases. The pipeline runs underground and with a diameter of DN 250 / 10" it is designed for a maximum flow of 600 m^3/h / 21185 f^3/h at 40 bar / 580 psi. The leak detection system should be integrated into the existing process control system (PCS 7) and provide reliable monitoring at all times.

KROHNE

3. KROHNE solution

Following thorough consultation the Heide refinery opted for the PipePatrol leak detection system. KROHNE commissioned, configured and calibrated the system on site.

PipePatrol uses the measurements made available via the process control system and was integrated into the existing pipeline monitoring system as per customer request. The leak tests carried out for TÜV approval were made possible using a valve in the pipeline. The leakage rate was approx. 5 m^3/h / 176.5 f^3/h, PipePatrol detected all leaks within 30 s and sent out the alarms within 60 s. The location of the leaks was accurate to within 400 m / 437 yds or approx. 1% for the entire pipeline. This exceeds TRFL requirements.

4. Customer benefits

Installation of the PipePatrol leak detection system has guaranteed safe monitoring of the multi-product pipeline. The customer is extremely satisfied: since its installation in 2006, the system has been functioning reliably with an extremely low rate of false alarms. As a result of this success, in 2012 the Heide refinery decided to purchase additional PipePatrol systems for a total of five pipelines.

5. Products used

PipePatrol

- Pipeline leak detection system for liquids and gases
- E-RTTM (Extended Real Time Transient Model) based leak detection and location
- Meets API 1130 and TRFL standards
- Can be a completely independent solution or integrated into existing instrumentation and control systems

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