

An essential tool for the pipeline operator

The ROSEN Pipeline Data Logger provides oil and gas pipeline operators with invaluable information on everything from pipeline process conditions to cleaning tool behaviour, allowing them to run inspection tools efficiently and with confidence.

The ROSEN Pipeline Data Logger (PDL) is an instrument for measuring process data and tool behaviour in a pipeline during a cleaning run. It can be easily mounted directly onto a pipeline cleaning tool.

The PDL can be utilised in pipelines ranging from 4in upwards. Multiple pressure, temperature and acceleration sensors record the data with ultra-high resolution to provide information on pipeline process conditions and cleaning tool behaviour for a wide range of applications. In some cases, the PDL can even eliminate the need to run traditional (and more expensive) caliper tools.

The technology effectively provides reliable recognition of girth weld patterns (through ΔP and acceleration data), and local speed estimates, recording change in the ΔP profile to monitor progress during the run.

Product history

Pipeline integrity being one field where the ROSEN Group had invested much time and technology, ROSEN engineers recognised the potential value of recording reliable data about pipeline conditions (such as temperature profile) prior to running inspection tools. They knew such data could be essential for predicting the dynamic running conditions of subsequent inspections.

Likewise, pipeline operators wanted to know temperature and pressure values throughout their pipelines. Having already developed instrumented cleaning tools – where a high-speed data logger is a key component – ROSEN developed a miniature data logger capable of being mounted on a pipeline cleaning tool. First introduced in 2003, the PDL has become a common tool in many a pipeline operator's toolbox.

System description

The ROSEN PDL is available in two sizes (4in and 14in) and three editions. The PDL Standard carries absolute pressure and temperature sensors. PDL Professional includes additional sensors to record acceleration in X, Y and Z axes, while PDL Advanced includes both acceleration and differential pressure (ΔP) sensors.

The fast-response sensors are sampled with a 500Hz frequency. Data of each parameter is stored with an interval of 0.25-10s (programmable) as minimum, maximum and calculated average value for each interval.

All recording is time-based, and distance correlation can be obtained accurately when the cleaning tool is running at a constant speed. Correlation can be improved by combining

the PDL data with benchmarking information using a cleaning tool transmitter.

PDL is delivered complete with a software licence for initialisation prior to the run and easy data read-out (ROSEN Service Desktop) and visualisation (ROSEN Chartman) of the recorded data.

The alkaline battery life is over four days and the lithium over ten days. Lithium batteries are required in working temperatures above 60°C. The 14in model can operate for well over 30 days on alkaline batteries.

Applications

The applications of the PDL range from locating dents, or other diameter reductions in case of gauge plate damage, to measuring process conditions for comparison against theoretical values, including:

- temperature profile to calculate heat transfer and density
- temperature profile for fine-tuning of liquid drop-out and inhibitor requirement calculations (e.g. seasonal influence)
- temperature effect on coating integrity and corrosion rate
- pressure profile for monitoring pipeline efficiency over time
- hydrate formation modelling
- wax deposition modelling
- location of restrictions due to dents or deposits
- monitoring of cleaning progress
- cleaning tool rotation and wear analysis
- actual measurement of ΔP across the cleaning tool as a function of internal diameter (e.g. dual diameter pipelines).

The pipeline operator can rely on and benefit from the experience of ROSEN in data interpretation. However, because pipeline operators normally know their pipeline systems and the operational conditions, in most cases clients are in the best position to analyse the data themselves.

With the PDL from ROSEN, the pipeline engineer can analyse and monitor the process conditions in his pipeline system. From construction (location of dents) through start-up (verification of predicted operating conditions) to regular operation (changes in flow and cleanliness), the instrument provides invaluable data for the pipeline operator. ■

Further information
ROPLAST Lingen (Germany)
www.roplast.de

