

DIGITALISATION TO THE RESCUE

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Oil and gas is in a critical state of transition. Following a sustained price boom, where production was prioritised at nearly any cost, 2014's crash heralded a 'new normal'. Experts now predict companies will need to operate within a US\$40-\$60 per barrel range for the foreseeable future.

It has also become clear that traditional responses such as layoffs and plant shutdowns are insufficient. For example, as reported by Strategy&, part of the PwC network, while revenues of upstream, midstream and oilfield services companies declined 40 per cent between the third quarters of 2014 and 2015, operating expenses, only fell nine per cent. New approaches are needed, particularly given the industry's aging asset base and retiring workforce.

Digitalisation now offers better solutions to old problems

Today's affordable sensors, high capacity wireless networking capabilities and enhanced computer processing power mean remote management, automation and cloud-based computing enable companies to deploy fewer experts across a wider set of assets. For example, Queensland Gas Company (QGC) is able to manage a 540 km pipeline and over 6000 wells spread over 3500 km² with fewer than four people. ABB's System 800xA lets operators in a 24-hour control room in Chinchilla easily monitor and regulate the operations of wells, pipeline and processing facilities via a single user interface while liaising seamlessly with QGC's Brisbane headquarters.

We've been using digital for years in pipeline oil and gas – so what?

While many midstream operators already use digital solutions in the form of advanced measurement devices such as electric flow metering and data-intensive pipeline inspection gauges, there is still considerable room to optimise operations.



QGC receipt station near Wandoan

To remain competitive in a low price environment, companies need to better distill the data they currently receive to generate new insights. They should also explore methods of collecting additional information, such as through the deployment of drones to conduct pipeline flyovers, regulations permitting. Fleet management can also be improved via increasingly sophisticated tracking technology.

Additionally, with the growth in unconventional energy like liquid petroleum gas (LPG) and natural gas, companies must adapt aging infrastructure to track and optimise greater flows of an increasingly complex array of product from and to many new locations. To that end sensor and machine data, weather information and geolocation data can be more effectively mined to improve predictability and performance.

Properly harnessed pipeline data can be used to optimise routes to market and help operators react quicker to fluctuating pricing

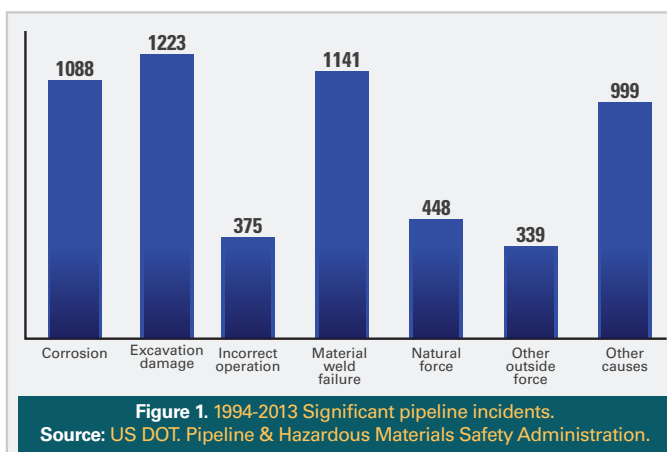
and volumes. Electricity market indicators, for example, may signal increased future gas demand. Extracting such insights from big data will enable digitally savvy companies outperform competitors missing such signals by using outdated forecasting methods.

Similarly, from a supply standpoint, by analysing flow history and having a real-time view of conditions, operators can better predict where and at what pressure and volume product will arrive, meaning they can optimise configuration plans and maximise profitability.

Digitalisation can also help maintain supply integrity. Theft from pipelines and other sources is estimated to cost over \$37 billion globally. And, given a tanker can be filled in less than 15 minutes, prompt illegal tap detection through real-time monitoring is a useful tool to protect revenues.

Additionally, as outlined in figure 1, pipelines fail for various reasons. Many of these can be minimised through increased automation and surveillance, reducing operating expenses while also lessening the likelihood of major spills leading to even costlier regulatory burdens.

Similarly, intruders will also be detected using laser pulses and all stations, manned and unmanned, will be surrounded by fences. Each fence line and surrounding area will be automatically monitored 24 hours a day via fiber optic cables. The system will attempt to verify any questionable activity using CCTV and, if it 'sees' something suspicious, will sound the alarm and present the evidence to the operator along with what standard operating procedures should be considered.



Conclusion

Digitalisation can help midstream operators not only survive, but thrive in the 'new normal' of low prices. It can improve profit margins through better pipeline monitoring, more efficient transportation fuel cost management, more accurate supply and demand forecasting and by providing a better view of overall operations.