




# SEA CHANGE

The drive for sustainable subsea solutions

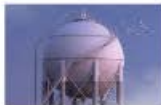


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## DIGITALISATION DELIVERS

How digital tools can assist  
in future-proofing operations



## CONFRONTING CORROSION

Advanced coatings lead the  
battle against this costly issue



New surface-tolerant epoxy repair resin, Belzona 1984

“  
This resin can be applied directly to damp, wet and underwater surfaces without the need for abrasive blasting

## RIGOROUS TRAINING PROGRAMME

To apply Belzona SuperWrap II to ISO/ASME standards, applicators are required to complete a rigorous training programme at one of Belzona's 16 training centres located worldwide. By thoroughly equipping applicators with the skills and expertise to successfully apply the composite wrap system, this ensures that an excellent standard of application is maintained.

To uphold this standard, every two years, the company's Corporate Belzona SuperWrap II Trainer Committee conducts a mandatory audit of all trainers, facilities and internal staff. Upon successful completion of the audit, Belzona SuperWrap II accreditations are then renewed. Again, this process is designed to ensure a consistently safe and successful application of the composite wrap system.

## REHABILITATION PROGRAMME

As industries continue to ratchet up their carbon mitigation measures in line with the net-zero by 2050 pathway, the use of polymeric repair and protection technology offers a real boon for maintenance engineers. The process of replacing damaged assets incurs a hefty carbon footprint, not to mention considerable financial expenditure.

With polymeric technology, engineers can successfully bypass the carbon- and cost-intensive process of replacement, and instead rehabilitate their assets and protect them against future damage. Now, this can be achieved even in the most challenging application environments thanks to the surface-tolerant epoxy resin, Belzona 1984. \*

Chloe Hirst is with Belzona.  
[www.belzona.com](http://www.belzona.com)

## LIVE VIDEO STREAM FROM INSIDE YOUR NATURAL GAS PIPELINE

▶ Process Vision

LineVu is a patented camera system that detects contamination in high-pressure gas systems.

The first of its kind.



**Real-time video streaming**  
24/7 monitoring with instant operator feedback



**Proactive monitoring**  
Proactive monitoring of glycol and NGL carryover



**High resolution video camera**  
Live, high-resolution video using image processing to generate automatic alarms



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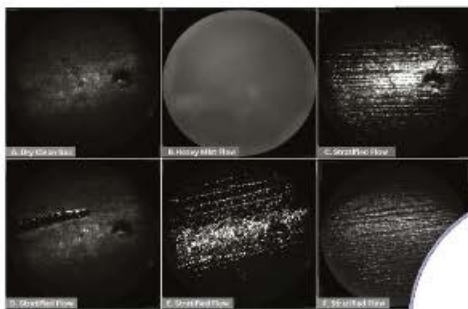
# RETHINKING GAS QUALITY

Hydrocarbon dewpoint: the gap between theory and reality. By Paul Stockwell

For decades, hydrocarbon dewpoint has served as the industry's standard for determining gas "dryness" in natural gas transmission and distribution. However, recent findings are suggesting that relying solely on hydrocarbon dewpoint is not enough to ensure dry gas. Widely variable results across dewpoint measurement methods highlight a significant accuracy gap that leads to undetected liquids in pipelines. This variability introduces risks to operations, making a case for advanced tools to provide a more comprehensive approach to gas quality.

Traditional hydrocarbon dewpoint is a key factor in gas sales contracts, determining if natural gas supplies meet the "dry gas" criteria essential for safe transmission. Even small volumes of liquids – mist or stratified flows of hydrocarbons – can cause operational challenges downstream. When these go undetected, they can lead to equipment damage, costly disruptions and inefficient operations. Unfortunately, variations in dewpoint calculation methods can create uncertainty about the true condition of gas in the pipeline, with temperature results for a single gas mixture sometimes spanning up to 186 F (103.6°C)<sup>[1]</sup>. This inconsistency is a growing concern for gas suppliers and end-users alike.

To bridge this reliability gap, the industry must now look at advanced visual monitoring technologies. LineVu, a pioneering pipeline camera system, offers real-time visualisation of gas flows inside high-pressure pipelines, allowing operators to detect actual liquid presence directly. Unlike hydrocarbon dewpoint measurements, which provides only inferred data about liquid formation based on pressure and temperature calculations, LineVu delivers a live view inside the pipeline. This live video feed enables operators to spot liquid mist, stratified flows, and small volumes of natural gas liquids (NGLs) that traditional



The variety of flow regimes observed

LineVu mounted on a gas pipeline



measurements fail to report.

The financial implications of undetected liquids are significant. Operators may unknowingly pass substantial liquid volumes through custody transfer points, resulting in high maintenance costs and reduced equipment lifespan. For example, an unobserved liquid presence at just 0.1% of the gas volume in a 100MMSCF/D pipeline could result in over 10,000 gallons of lost NGLs daily, translating into millions in annual revenue losses.

Liquid carryover in "dry" gas pipelines can lead to severe operational impacts in gas turbine power stations. The presence of compressor oils, or glycol can block fuel nozzles, causing imbalances and downtime.

## IDEAL COMBINATION

In many cases, combining hydrocarbon dewpoint with LineVu's real-time video data is proving invaluable. LineVu cameras, installed at standard tapping points along pipelines, enable operators to gain precise insights into the actual gas conditions. This level of transparency supports operational decisions,

ensuring that pipelines truly meet quality standards and reducing risks of liquid-related failures. Additionally, with real-time monitoring, any deviations in expected gas quality can be addressed immediately, protecting downstream applications from contamination and unplanned downtime.

As the gas industry faces increasing demands for accuracy and operational reliability, visual monitoring is becoming a critical tool for modern gas quality management. Technologies like LineVu are validating other gas analysis and flow measurements, providing a comprehensive view that safeguards both operators and end-users from the higher costs and risks of unobserved liquid carryover. ■

Paul Stockwell is Managing Director of Process Vision. [www.processvision.com](http://www.processvision.com)

### References

[1] Embry, D.L., May, E.F., (2024, September 17-20), Increase LNG Profitability by Early Identification and Mitigation of Solids Formation from North American Pipeline Gas [Paper and presentation], Gastech 2024, TX, USA.