

Case Study

How a Gas Processor in the Middle East Improved Compressor Protection with LineVu



SECTOR:

Gas Processing

MEDIUM:

Natural Gas

CUSTOMER:

Withheld



In early 2025, a gas processor in the Middle East faced an unexpected reliability puzzle at one of its major gas processing facilities. Two nearly identical processing trains shared the same feed gas, yet one train began to show signs of trouble. During routine maintenance, engineers uncovered an unusually high build-up of sludge in Train 2, while Train 1 remained clean. The discovery raised immediate questions: why was only one train affected, and could this issue escalate into a costly outage? Given the potential impact on safety, production, and profitability, the Operator partnered with Process Vision to get to the bottom of the issue. The solution would need to provide not just data, but clear proof of what was really happening inside the gas stream.

THE CHALLENGE

Gas compressors are designed to run on dry gas. When liquids or solids enter the system, they can cause erosion, seal damage, and even catastrophic failure; events that can result in millions of dollars in repairs, downtime, and lost production. Standard monitoring tools rely on calculated Hydrocarbon DewPoint (HCDP) to declare gas as 'dry.' However, field experience shows that HCDP readings often miss both transient and persistent liquid carryover, particularly in mist or stratified flow. The challenge here was twofold: identify why two identical trains were behaving so differently, and find a reliable way to prevent liquid ingress from ever becoming a costly incident.

THE SOLUTION

To uncover the truth, Process Vision deployed LineVu, a high-resolution process camera, upstream of the first-stage compressors on both trains. Certified for hazardous areas (ATEX Zone 1 and Class 1 Div 1), the cameras delivered continuous, real-time footage of the gas stream, allowing operators to literally see mist, liquid slugs, or solid contamination that conventional sensors could not detect. Each frame of video was synchronised with live process data and analysed using machine learning models to highlight conditions that trigger liquid carryover. Smart alarms were developed that could alert operators the moment abnormal conditions appeared, enabling swift, targeted interventions before damage occurred.

MORE INFORMATION

CONTACT US

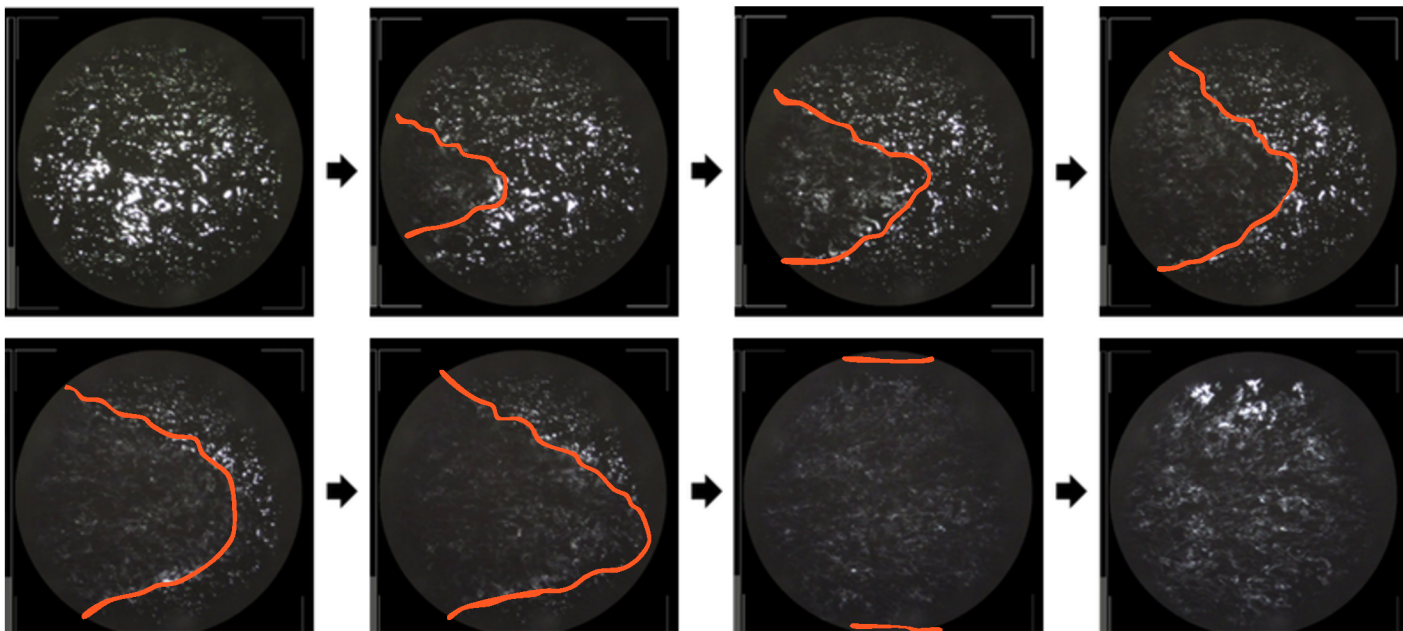
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RISK AWARENESS

During the study, a significant safety event was captured when the plant experienced an unplanned trip. Sequential video frames (below) clearly show a flow of condensate being swept directly into the first-stage compressor inlet. In the seconds between frames, the liquid front accelerated. This type of liquid carryover is one of the most dangerous scenarios for gas compressors. In extreme cases, it can lead to catastrophic mechanical failure or even casing rupture, posing severe risks to personnel safety, environmental compliance, and plant availability. This sequence was recorded in real time and allowed operations teams to review frame-by-frame exactly how the event developed, enabling a targeted response to improve the risk management.



IMPROVEMENTS

This successful trial opens the door to new operational possibilities. With visual confirmation of gas quality, the Operator can extend this technology across its network to optimise separator performance, enhance custody transfer certainty, reduce unnecessary pigging, protect turbines at power plants, and safeguard LNG feed gas quality. By integrating LineVu into its Asset Integrity Management Program, the Operator also strengthens its compliance with ASME B31.8S-2022 and supports methane-intensity reduction targets, delivering both environmental and financial value.

BUSINESS CASE

The economics are compelling. Even a small liquid volume fraction (0.1%) in a 100 MMSCFD export line at 1,000 psi equates to more than 748 gallons/day of saleable condensates worth over \$5.6M annually. For gas receivers, catching liquids early prevents compressor trips (often ~\$600k each), reduces pigging costs (up to \$35k/mile), and extends dry-gas seal life from around 1 year to 3 years or more. With simple retrofit hardware, rapid installation, and minimal data bandwidth requirements, LineVu offers a low barrier to adoption and a high return on investment, turning invisible risks into visible opportunities.