
Casing Integrity Monitoring for Mature Fields
Advanced Casing Integrity Monitoring for Advanced Performance

Over time, casing strings can begin to deteriorate, affecting the production and safety of the well. Keeping a close eye on the integrity of casing strings is important, as it helps to prevent critical failures and avoid unnecessary intervention. Through improved casing integrity monitoring services, we help operators maximize well productivity while reducing the risk of reservoir damage or NPT.

The Challenge: Mature Wells in Harsh Environments

Many factors can negatively affect the integrity of a well’s casing. The most common culprit is hydrogen sulfide (H₂S), which is highly corrosive. However, changes in downhole pressure and erosive elements like flowing water can be just as serious a threat. Additionally, mineral, wax and asphaltene deposits can restrict the flow of oil and gas through the well, requiring extensive intervention to return the well to optimal performance.

As wells in these harsh environments age, the negative effects on casing integrity continue to increase. Mature wells, especially those undergoing secondary recovery, are particularly susceptible to integrity problems.

The Solution: Integrity Monitoring Systems

To prevent integrity problems from becoming critical, these wells require intervention in order to correct the issues. But unless the operator is certain that intervention is necessary, it can be an extremely expensive and unnecessary source of NPT.

That’s why Halliburton offers a variety of solutions that can be customized for each well to provide operators with a complete picture of casing integrity. This helps them maintain production as long as possible while still planning well intervention before failure occurs.

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A Variety of Technologies for Any Situation

Every situation – and every well – is different. That’s why we offer a variety of technologies to help operators gather the right information so they can make the right decisions.

- **CAST™ Tool – Ultrasonic Evaluation for Pipe and Cement**
  Halliburton’s CAST™ (Circumferential Acoustic Scanning Tool) uses ultrasonic sensors with complete azimuthal measurement capabilities to create a 360° image of the casing. It can even evaluate the cement beyond the casing at the same time. With real-time capabilities, these high-resolution tools are available in a variety of configurations for wells of almost every size and type.

  The CAST-M™ tool is run on mono-conductor wireline so it can work with e-coil tubing or tractors in deviated or horizontal wells. It can also be operated rigless and with much less pressure control equipment, making it a great choice for mature wells.

- **Multifinger Caliper (MFC) – High-resolution Internal Corrosion Measurements**
  The MFC tool uses dozens of individual gauges that actually feel the inside of the casing. This provides a high-precision 3D view of corrosion or buildup within the casing string. By combining the MFC tool with the CAST tool, operators can acquire the same information with two different technologies, ensuring accurate results even if the pipe is severely corroded.

  Additionally, the MFC tool can be used for time-lapse monitoring. By running the tool periodically, we create a 4D log of corrosion that helps operators detect trends and get a good estimate of when they need to plan preventative maintenance.

  We can also provide a statistical report on casing wear that includes histograms, depth-based damage profiles and tabular results to help operators make sense of the huge amount of data that the MFC tool gathers.

- **Magnetic Thickness Tool (MTT) – External Measurement for 3D Image of Casing Integrity**
  The MTT complements other measurements by providing a radial thickness profile in the tubing/casing. This versatile tool can deliver thickness maps for a wide range of tubular sizes. When combined with the MFC tool, it can provide a 3D assessment of internal and external corrosion or mechanical deformations.

- **Xaminer™ Electromagnetic Corrosion Tool – Cutting-edge Technology Inspects Corrosion through Multiple Strings**
  Halliburton’s new Xaminer™ Electromagnetic Corrosion Tool represents the latest advancements in integrity monitoring technology. It uses transient eddy currents that can penetrate beyond the first layer of casing and into a second. This gives operators the first ever look at corrosion on a production casing without first removing the tubing string. It can measure the percentage of metal loss and detect large holes or splits in the production string. This can give operators enough information to remediate any well integrity problems without the up-front cost of working over the well.

Looking Farther than Ever

In many wells, the production casing is extremely susceptible to corrosion. But it also sits outside the tubing string, making direct contact – and direct measurement – impossible. Halliburton’s new Xaminer™ Electromagnetic Corrosion Tool measures the decay from an electromagnetic pulse that can penetrate through multiple tublars, providing operators with valuable information about pipe condition that was not previously available.
Conveyance Flexibility Lets Operators Choose What Works Best
In some cases, operators need real-time information to narrow their investigation or make decisions quickly. In other cases, running tools with memory allows for a faster, more efficient operation on slickline. Whatever the case, we offer conveyance flexibility so operators can choose what works best. All of our casing integrity monitoring tools can be run in real time via e-line, e-coil or tractors.

What Comes Next?
When the time comes for intervention, Halliburton has your back. We offer services that can return the well to safe, efficient operations. Whether it’s removing scale and debris with pipe cleaning services, or providing casing patch services, Halliburton’s broad portfolio of intervention services is at your disposal.

Halliburton: The Most Experienced Provider
Halliburton has a long track record of well logging and problem solving. Because we have more experience with a wider range of integrity monitoring solutions than anybody else in the industry, operators trust us to deliver the most complete picture of casing health.

Additionally, we offer a variety of technologies and conveyances that can be customized for each well so operators always get exactly what they need.

A Trusted Advisor
Halliburton provides more than just equipment. We deliver answers to operators’ most pressing questions. Regardless of the technology used, we present our clients with a wealth of information after every integrity monitoring job. From statistical reports with histograms, damage profiles and tabular results, to interactive 3D visualizations, we make sure our clients have everything they need to make informed decisions about their wells.
Sales of Halliburton products and services will be in accord solely with the terms and conditions contained in the contract between Halliburton and the customer that is applicable to the sale.