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## **Improved Integrity Solutions on the Casing Well Barrier Element through Enhanced Technology Resolution and Data Analytics**

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### Abstract

Casing corrosion and loss of well integrity has been a growing concern for facilities with underground storage caverns. The initial indication of corrosion failures can occur below the detection threshold of traditional logging technology widely available in the market. A new ultrasonic well logging tool has been developed that collects ultra high-fidelity data at a rate of over 50 meters/minute. Based on intelligent pigging technology in the pipeline industry, where defect detection sizing has been refined for many decades, these new tools are capable of collecting internal and external surface metal loss and geometry data on tubulars from diameters very small [2"] to very large [48"] and every size in between.

Deployed in thousands of wells to date, proactive use of this technology can identify aggressive localized corrosion anomalies before they become well containment problems. The high resolution of the anomaly shape and size lead to additive benefits such as automated burst pressure calculations, accurate corrosion rate analysis and asset lifecycle management. Finally, with all this accurate information gathered on barrier integrity, we can use machine learning based on the collected data to identify integrity threats across an entire field while targeting critical wells prioritized for future inspections. This paper will provide an overview of this advanced ultrasonic technology as well as provide case studies where we investigate its application in both the inspection and associated advanced engineering assessments within the industry.

**Key words:** Well Integrity, Logging, Corrosion, Inspection, Casing Integrity