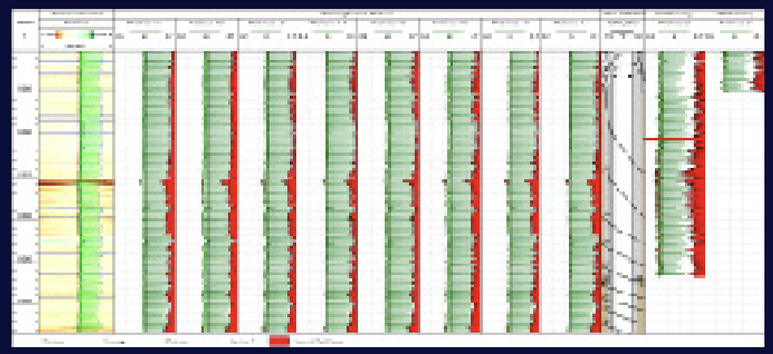
Complete evidence than conventional options

Pulse1 gives direct, sectoral electromagnetic integrity evidence for primary tubulars — complementing calipers when internal/external discrimination is required.

Capability	Pulse1 IGNIS	Multifinger caliper	Ordinary slim EM
Actual wall thickness in 8 sectors	Yes	No, estimates	No, average
All-around defect sensing	100%	10–30% contact	Low resolution
Total metal loss	Yes	No, Internal only	Yes
Insensitive to non-Fe scale/wax	Yes	No	Yes
Chrome completion suitability	Yes	Scratch risk	Yes
One slim tool, many tube sizes	Yes	Size-specific	Yes
Effective in gas-containing fluids	Yes	Yes	Yes



Suspected H2S-associated casing damage detected by PULSE1. High metal loss detected in intermediate casing. The production casing deteriorated most likely externally due to behind casing crossflow. Additionally, intermediate casing split was found - not associated to H2S.

Pulse1 IGNIS | Specifications

Measurment

Principle	Electromagnetics
Measurement type	Actual wall thickness in 8 sectors
Sensors / sensing	8 / 100% circumferential
Tube wall thickness range	0.2 to 0.5 in 6 to 12 mm
Accuracy	±2% to ±3.5%
Tube OD range	2-7/8 to 7 in 73 to 178 mm
Survey speed	6.6 to 20 ft/min 2 to 6 m/min
Survey mode	Memory or Real-time
Combinable	Pulse2, Pulse3, Pulse4 and caliper

Tube wall defects

Hole size in 2-7/8 in tube	>0.3 in I >7 mm
Hole size in 3-1/2 in tube	>0.3 in I >7 mm
Hole size in 4-1/2 in tube	>0.4 in I 10 mm
Hole size in 5-3/4 in tube	>0.6 in I >15 mm
Hole size in 7 in tube	>1.0 in I >25 mm

Inclination

Accuracy @ <85° deviation	±2°
Accuracy @ 85-95° deviation	±1.3°

Relative Bearing

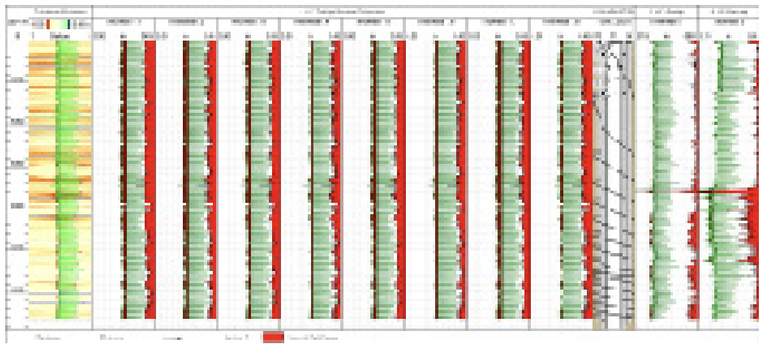
Accuracy @ >10° deviation	±5°

Mechanical

Temperature range	32 to 500°F 0 to 260°C*
Maximum pressure	20,000 psi 137.90 Mpa
Housing material	Inconel
Maximum H_2S content	≤30% with TFE/P black duro O-rings
Operating time*	48 hrs*
Max compression	5,300 kgf 11,800 lb
Max tension	9,000 kgf 20,000 lb
Outside diameter	2.0 in 51.5 mm
Tool length**	80.1 in 2,036 mm**

**Operating time can be extended up to 60 hrs with proper battery storage and operating temperature below 100°C.*
***With battery pack and centralisers*

Pulse1 IGNIS helps operators detect tube weakness earlier, improve remediation decisions and extend diagnostics into hotter, more complex wells.



Production casing was found in poor condition in 2022. A 4 ½" liner was installed to restore well integrity. The liner was inspected again in 2025.
Pulse1 has located several localised corrosions in 4 ½" liner, likely on the exterior, they could potentially progress into penetrations in the future.
In addition, Pulse-3E found further corrosion progression of production and intermediate casings.

TGT

Pulse1 IGNIS

Extreme-temperature tube wall-thickness mapping

True eight-sector wall-thickness assessment for primary tubulars in HPHT and geothermal wells up to 260°C.

Built for critical integrity applications

One slim electromagnetic platform for routine surveillance, targeted integrity evaluation and long-term asset assurance.

True wall thickness in eight sectors
Tube integrity depends on wall thickness and regular inspection is important to maintain a secure well.

All-around detect sensing
Holes and defects in the tube wall undermine mechanical strength and sealing performance.

Insensitive to surface deposits
Scale and wax deposits disrupt caliper and ultrasonic inspection techniques.

Senses internal and external metal loss
Caliper-based inspection techniques can only reveal internal metal loss; external corrosion and defects are invisible.

Non-scratch contact / Chrome Completions
The inner wall surface of corrosion-resistant tubulars are often coated with a thin protective layer.

Geothermal / HPHT wells
Extend diagnostics into hotter production and injection wells.

P&A and remediation support
Improve repair, isolation and abandonment decisions.

All fluids including gas
Harnesses electromagnetic techniques and is effective in all typical well fluids, including those containing gas.

Higher-confidence integrity decisions in conditions where conventional tools may be limited.

Direct wall thickness. All around the tube.

Pulse1 combines advanced electromagnetic sensing, proprietary sensors and 3D modelling to evaluate primary tubular condition with high confidence.

8 sensors /sectors

100% circumferential coverage

± 2% up to accuracy in tubing

260°C Maximum temperature

WHAT PULSE1 IGNIS DELIVERS

- Actual wall thickness in eight sectors — not average thickness.
- Internal and external metal loss sensing in production tubing and casing.
- Real-time or memory operation; combinable with Pulse2, Pulse3, Pulse4 and caliper.
- In-house design, engineering and manufacturing for reliable Pulse performance.

Why conventional inspection can fall short

Hot, complex wells need direct integrity evidence — not inferred thickness or partial contact coverage.

CALIPERS INFER, PULSE1 MEASURES

- Calipers measure internal diameter and estimate wall thickness by assuming nominal OD.
- External corrosion, OD variation and thermal material effects can remain invisible to calipers.
- Scale, wax and deposits can mask defects and invalidate thickness estimates.

COVERAGE AND COMPLETION RISK

- Caliper fingers physically contact only a limited portion of the inner surface, creating a risk of missing localised defects.
- In chrome or coated tubulars, hard contact may scratch sensitive inner surfaces.

Pulse1 IGNIS addresses these uncertainties through direct electromagnetic wall-thickness measurement across eight sectors.