A Non-Intrusive Method Using Induced Pressure Waves to Track Moving Objects Within Pipelines

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InnerVue™

INNERVUE™

Removing uncertainty

Non-Intrusive pressure wave analysis in pipelines and wells giving unique insight to manage the efficiency and integrity of your production assets.

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Operators objectives and challenges

Pipelines transport a wide variety of fluids

Debris can build up over time

Maintenance required to maintain throughput

Tools can become lost or stuck

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Current technologies

Theoretical modeling

Tracking with transmitter source
(acoustic, electro-magnetic or isotope)

External ultrasonic measurement

Acoustic survey

Pressure wave analysis

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InnerVue™ Non-Intrusive Pig Tracking

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Object locating and tracking

Pinpoint Blockage Location

Track objects during recovery

Confirm tool moving

Early warning of potential problems during recovery

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How it works

Pressure wave created at one end of pipeline

Reflected signature wave corresponding to features in the system:
- Barriers to flow – complete/partial
- Deposition of wax/other
- Leaks

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Set up

One person mobilization with air freightable equipment

Access to system through instrumentation tie-in point
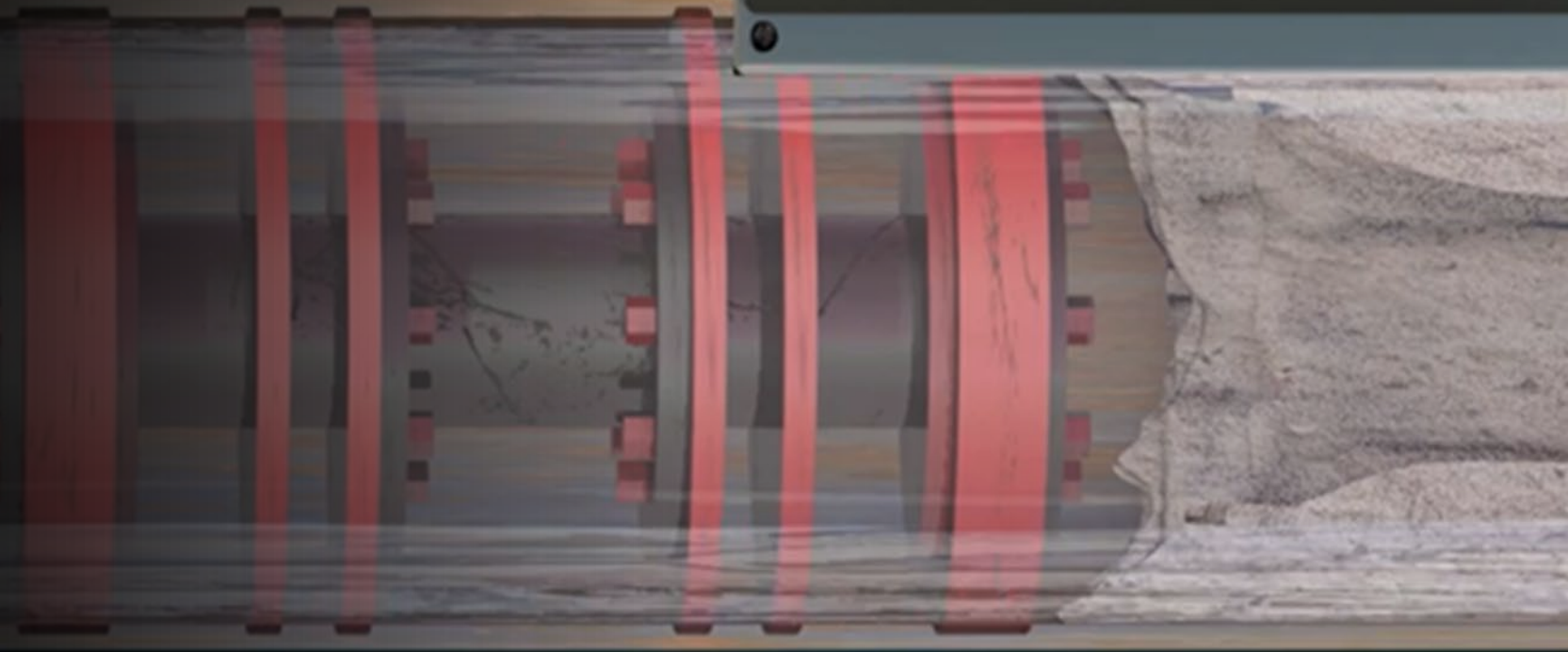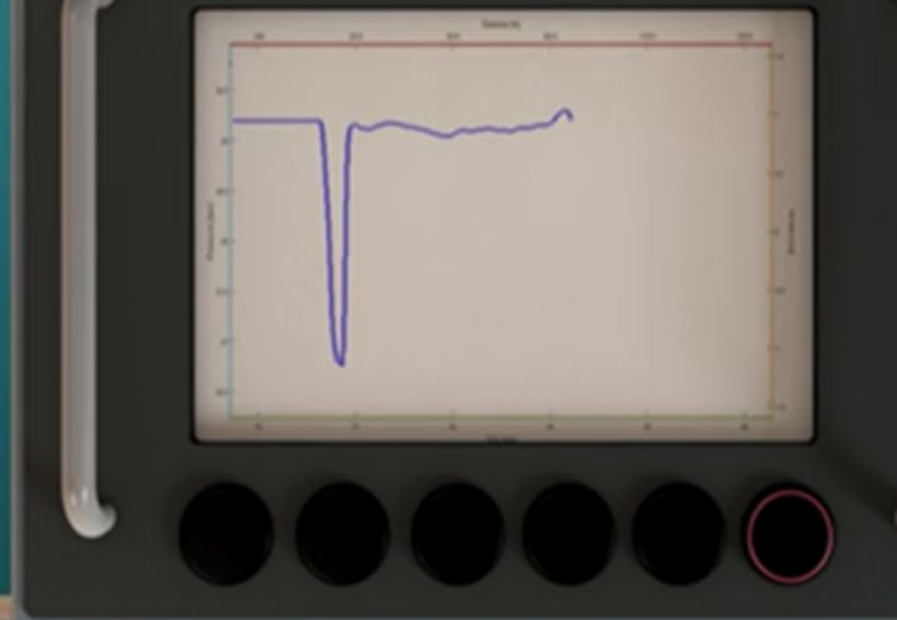
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Object Tracking
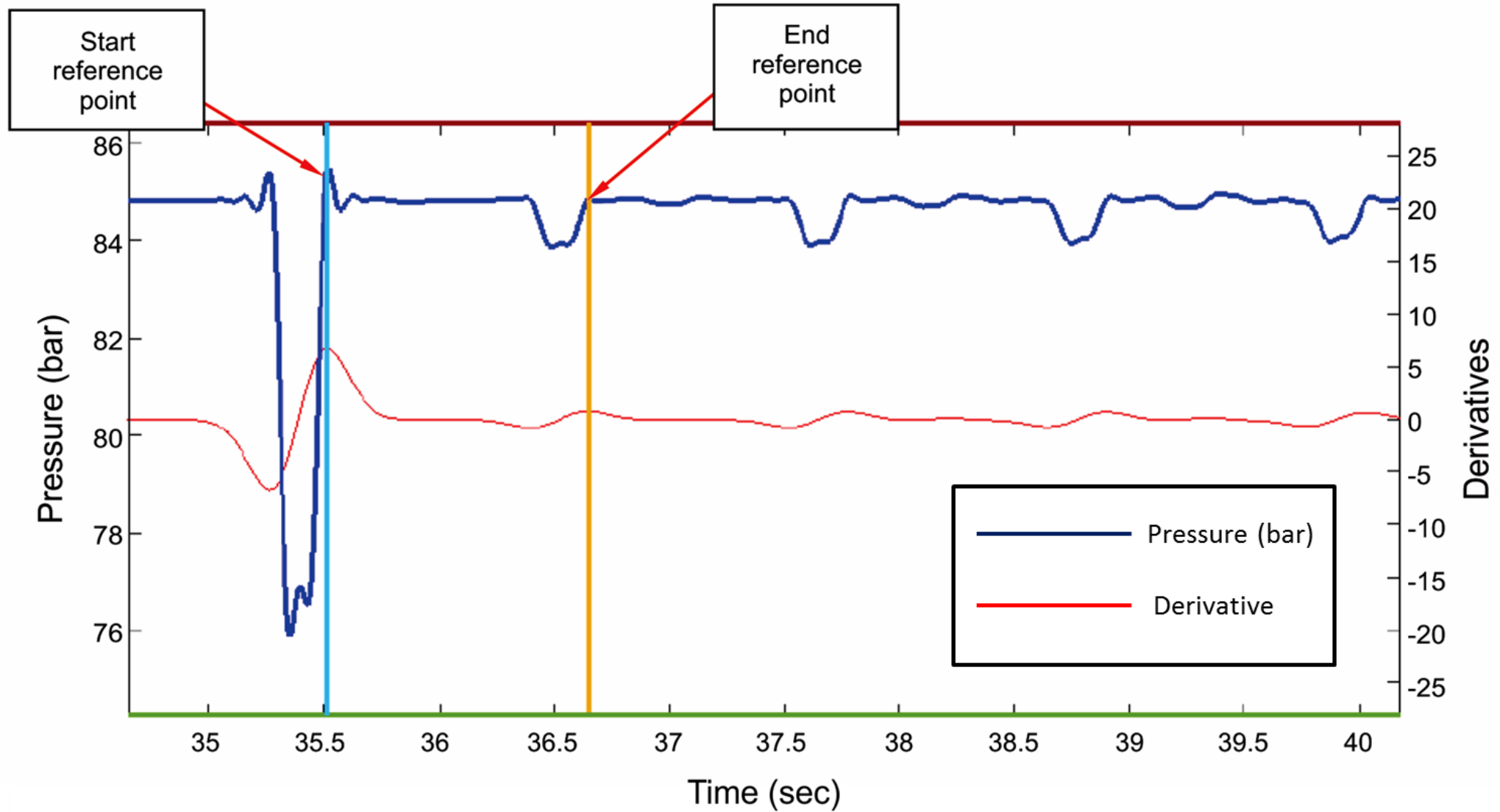
Pressure wave generated by quickly bleeding a small volume from the line

Locate pig or object in pipeline

Wave reflects off blockage/restrictions

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Typical pressure wave signal and response

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Case Study – Commissioning Pig Stuck in Pipeline

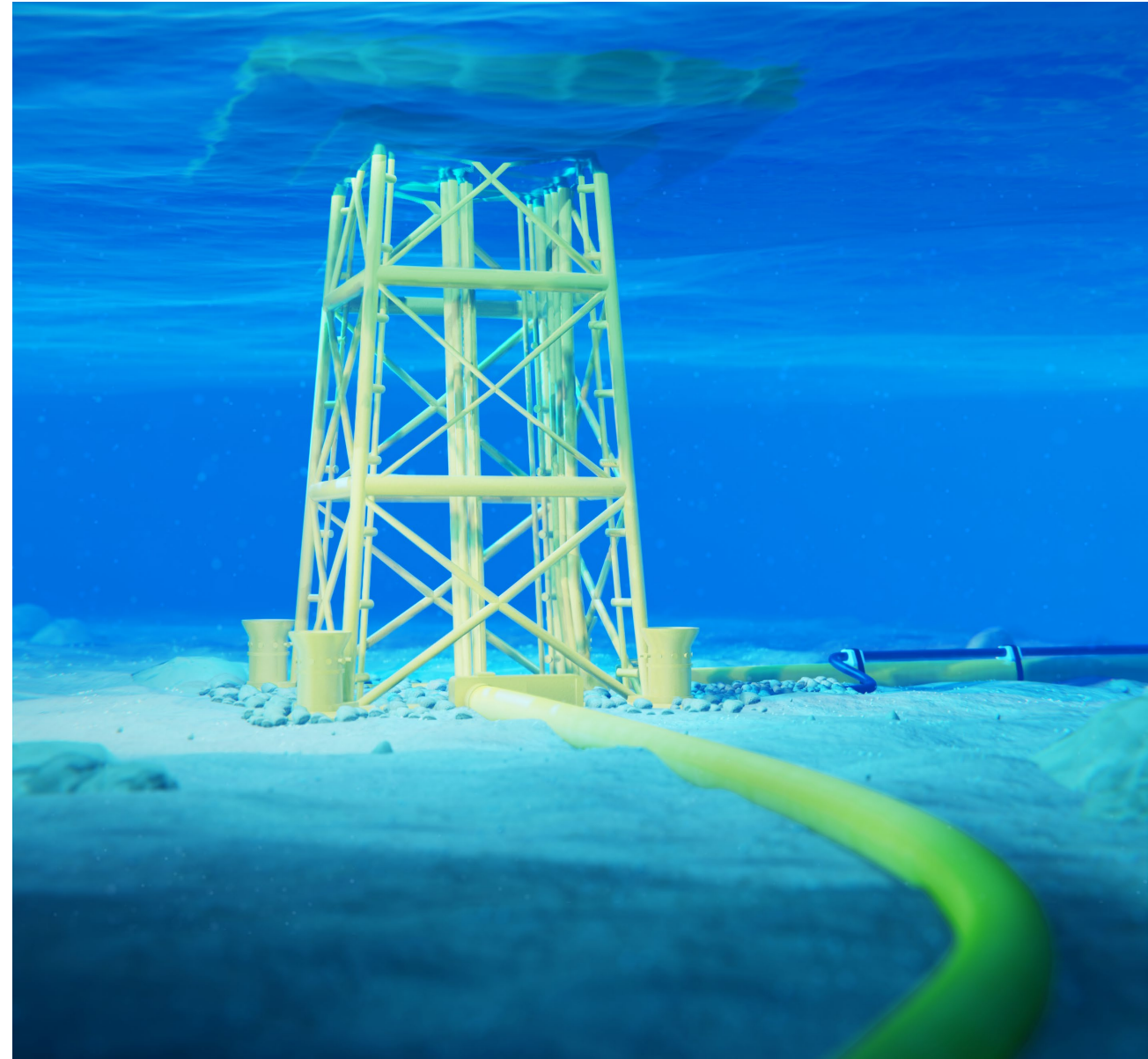**HALLIBURTON**

Case study

Stuck commissioning tool

120km subsea pipeline

Non-intrusive pressure wave survey performed

Low risk

Rapid locating of stuck tool

Tracking of stuck tool during remediation
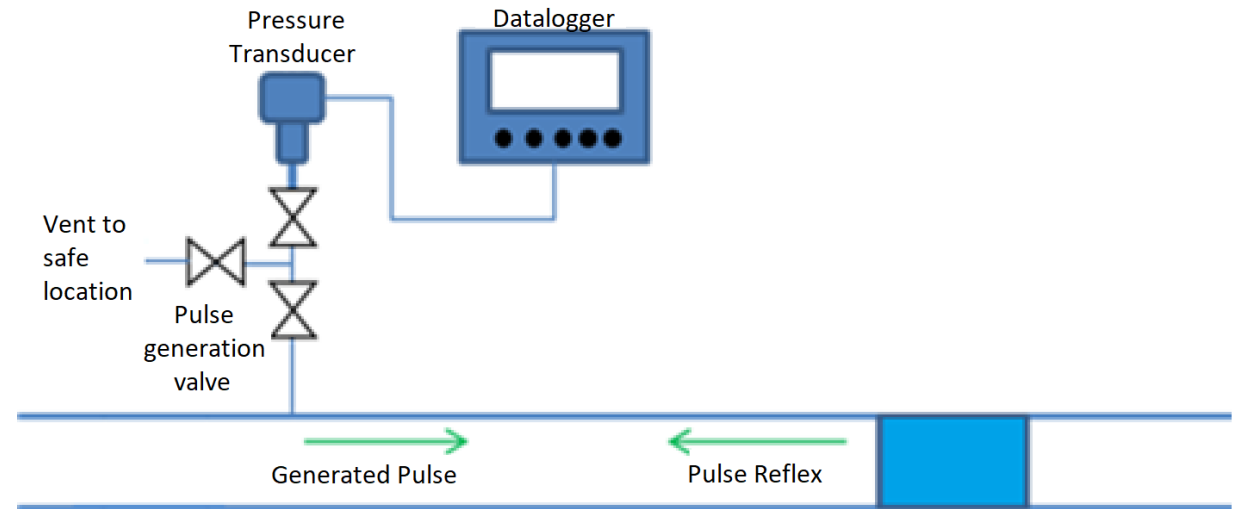
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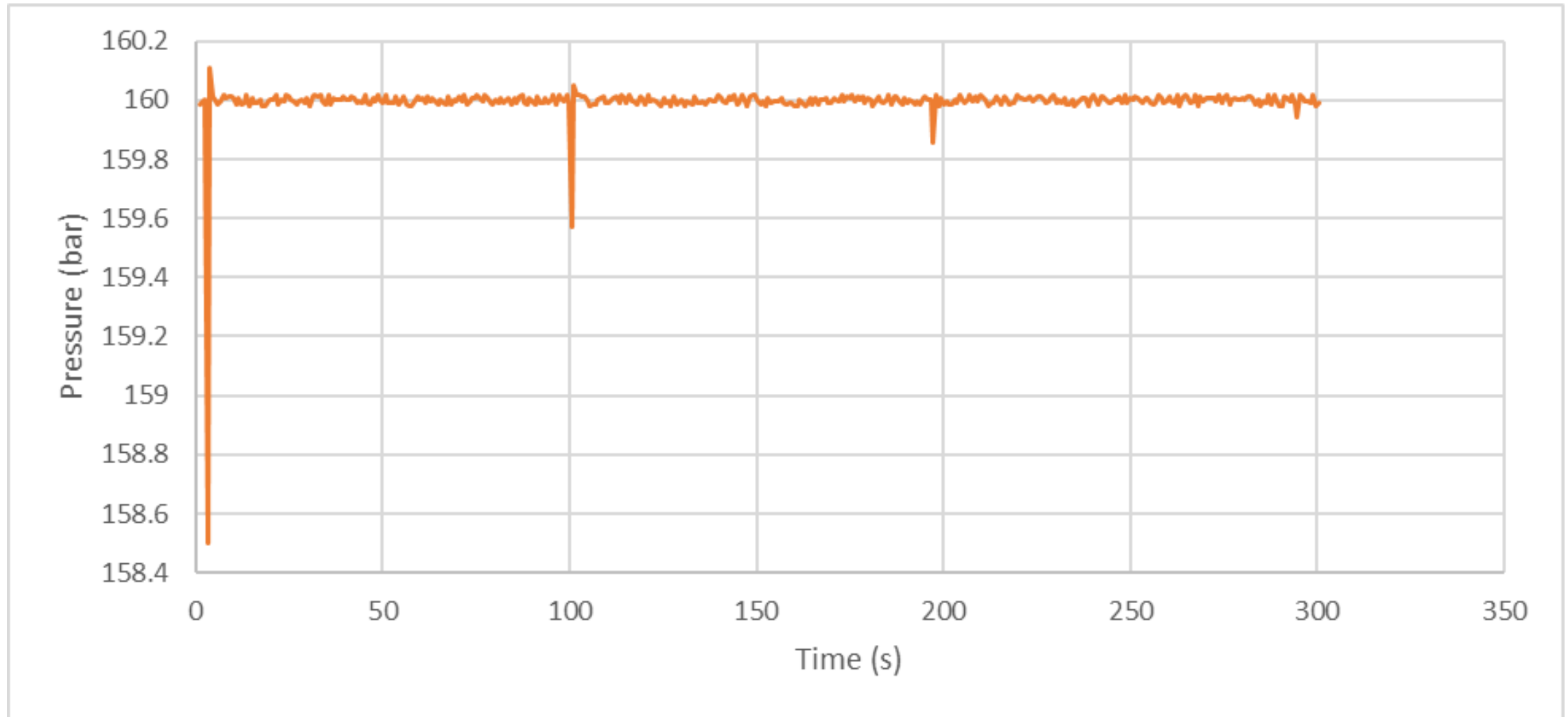
Equipment setup

Data recorder connected to system

Tie-in point on topsides

Pulse valve rapidly opened and closed to generate pressure wave
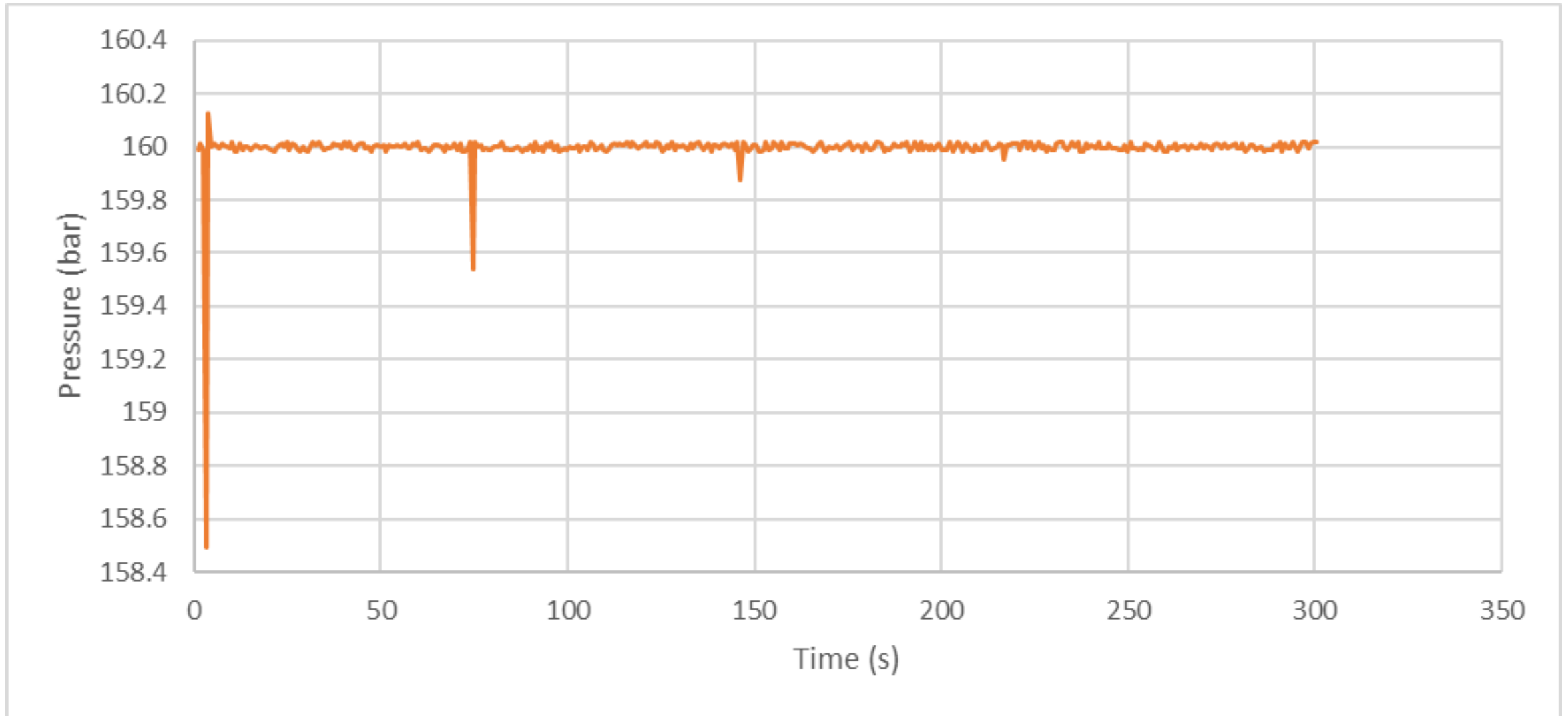
Wave travels down pipe and bounces off pig

Pressure
Transducer

Datalogger

Vent to
safe
location

Pulse
generation
valve

Generated Pulse

Pulse Reflex

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Pressure response

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Pressure response 2hrs into recovery operation

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In summary

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Summary

Pressure wave analysis methodology validated with field proven results

Acute level of accuracy

Removes risk of inserting tools into pipeline

Cost effective, low risk option for tracking moving objects

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THANK YOU