

CASE STUDY

Large-Diameter Screening & Scanning

Complete Inspection of 36" Jetty Lines

2026



BACKGROUND

36" JETTY LINES



Inspection of two parallel 36" lines from tank to jetty.

- ◆ 100% inspection coverage required.
- ◆ History of 6 o'clock corrosion, including some leaks.
- ◆ Mixture of spiral weld and seam weld pipe.

■ Equipment



**Wavemaker® G4MINI
& Standard EFC Ring**



QSR1®

GUIDED WAVE SCREENING

SCREENING RESULTS

Screening rapidly revealed variation in condition along each line, allowing sections to be classified into three distinct levels.

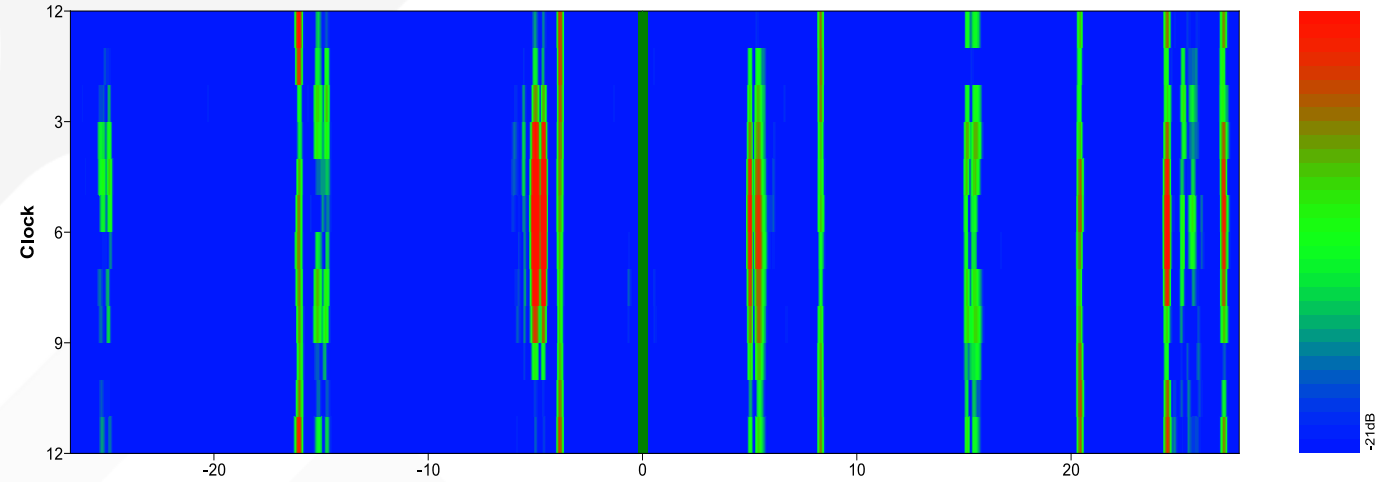
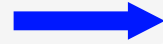
1. Little or no damage
2. Isolated area of significant damage
3. Large number of defects



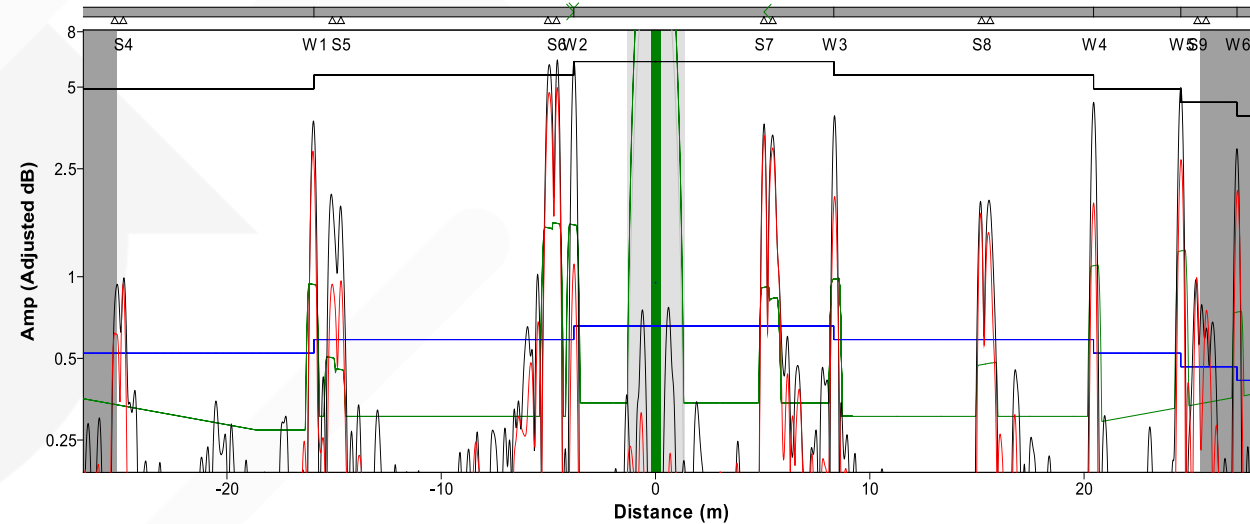
GUIDED WAVE SCREENING

1. LITTLE OR NO DAMAGE

Clean Unrolled Pipe Display



Calibrated Weld DAC



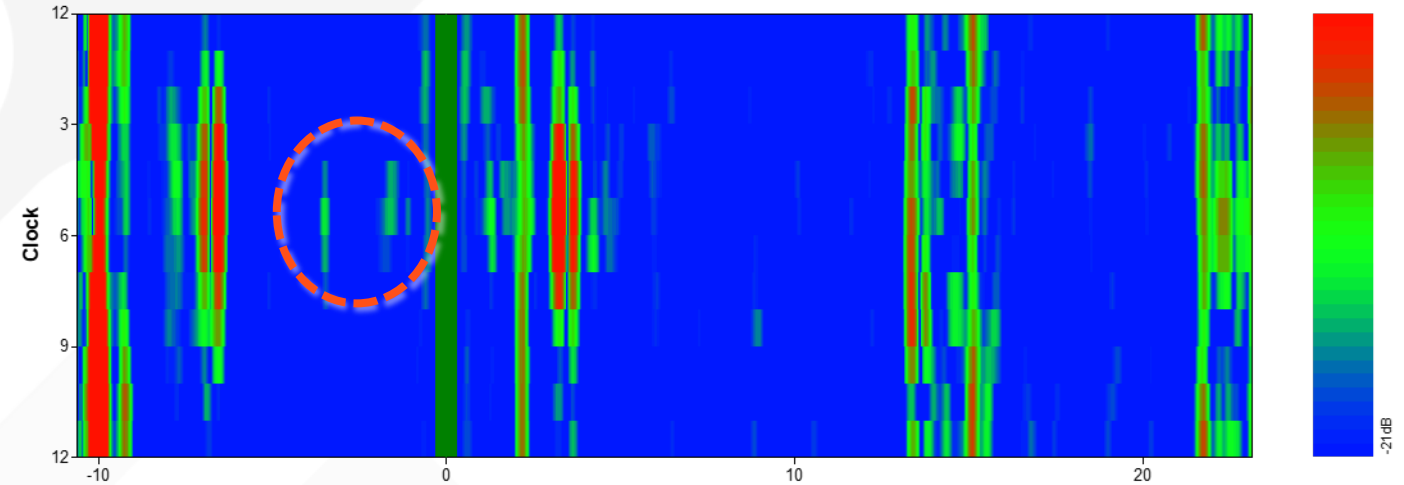
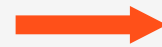
1% Detection Threshold



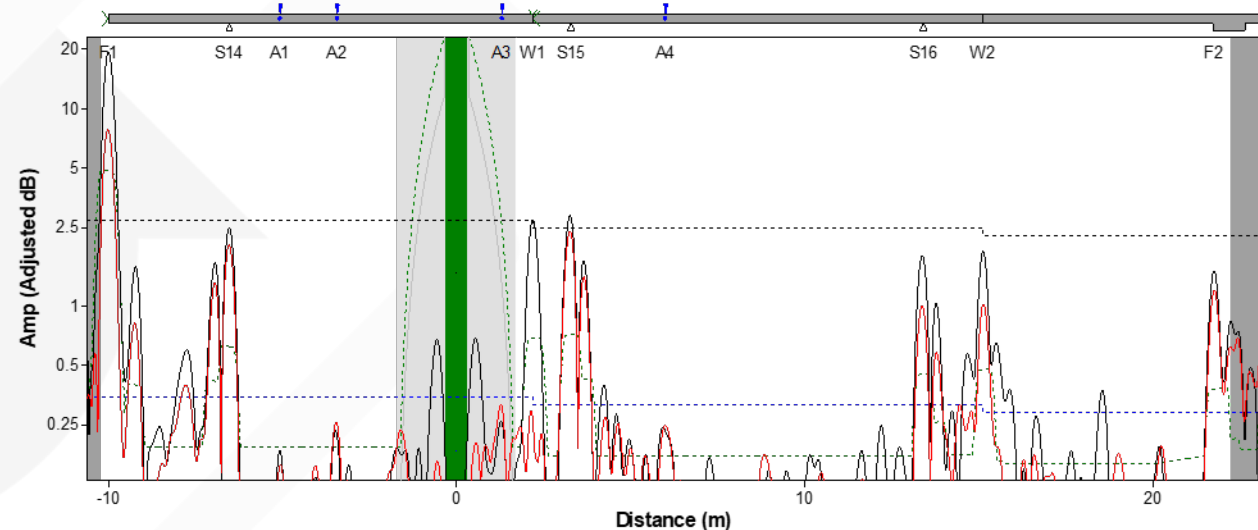
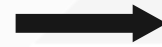
GUIDED WAVE SCREENING

2. ISOLATED AREA OF SIGNIFICANT DAMAGE

Unrolled Pipe Display
showing 6 o'clock indications



Calibrated Weld DAC



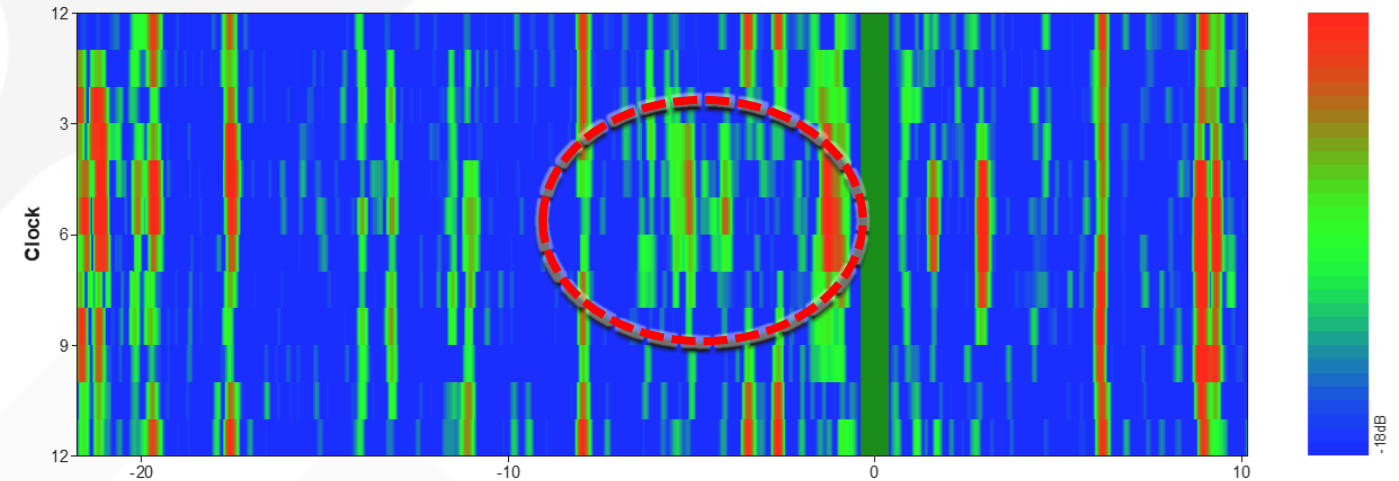
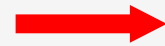
1% Detection Threshold



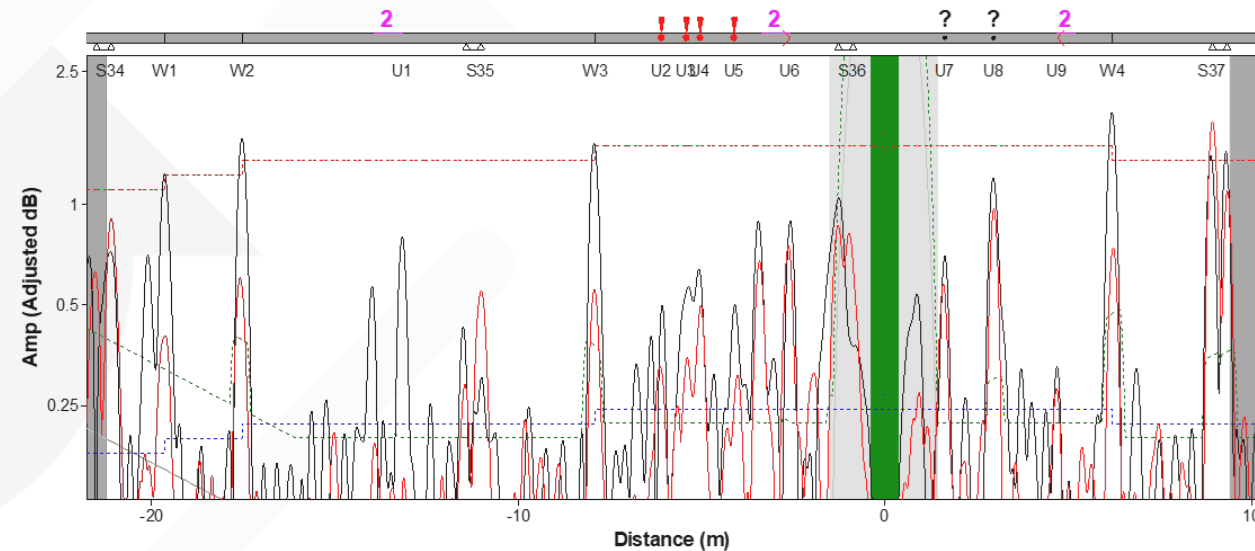
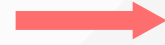
GUIDED WAVE SCREENING

3. LARGE NUMBER OF DEFECTS

Unrolled Pipe Display
showing 6 o'clock indications



Weld DAC adjusted
to average for line



1.8% Detection Threshold



GUIDED WAVE SCANNING

PROVE-UP OF INDICATIONS

Indications at the 6 o'clock position identified by screening were proved up using **QSR1[®]** for accurate wall thickness profiling.

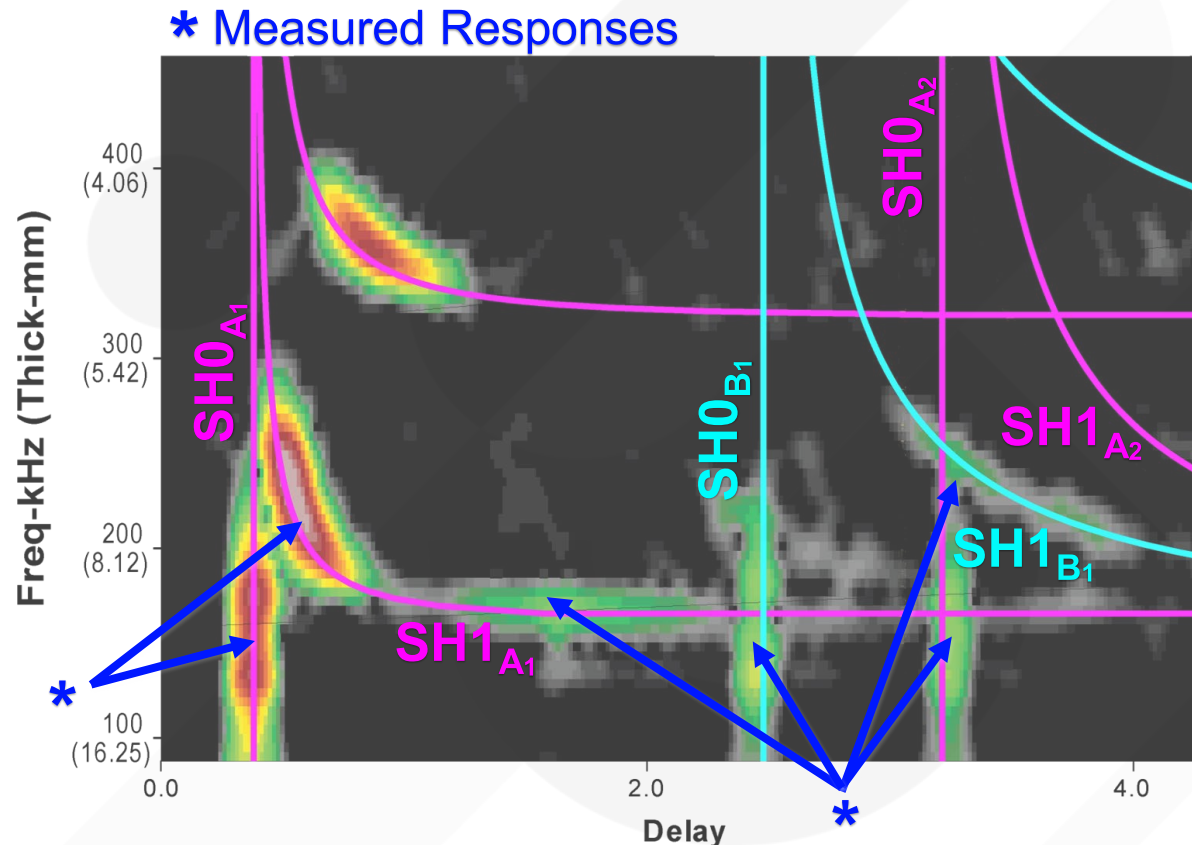


- ◆ Each scan covered 30-100 cm along the pipe, centred around the indication.
- ◆ Scanning was performed opposite seam or spiral welds to avoid interference.
- ◆ Automatic magnet adjustment configures QSR1[®] for different wall thicknesses in seconds.
- ◆ Scan speed of approximately 6 minutes per metre.
- ◆ 50 mm beam width enables rapid full coverage of the bottom half of the pipe using 50 mm scan steps.

GUIDED WAVE SCANNING

READING SCANNING RESULTS

The **frequency-time plot** shows measured transmission against the expected responses of the SH0 & SH1 shear horizontal guided wave modes used by QSR®.

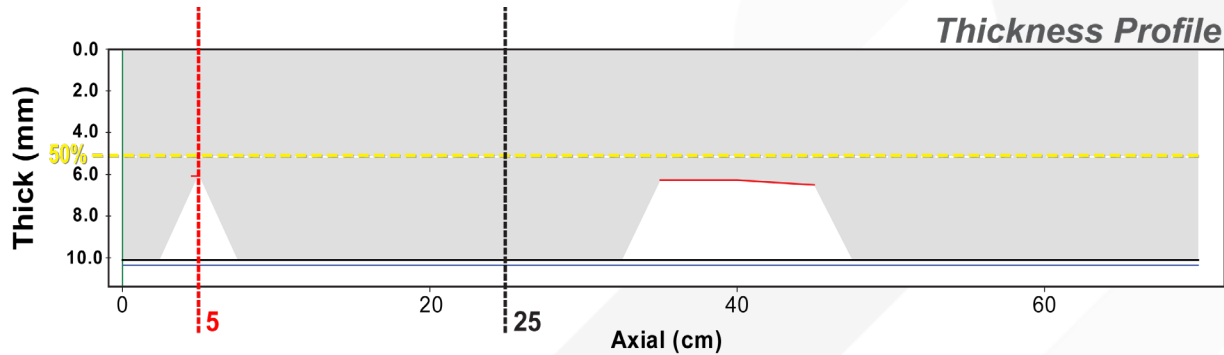


- SH0 – Non-dispersive
- SH1 – Dispersive

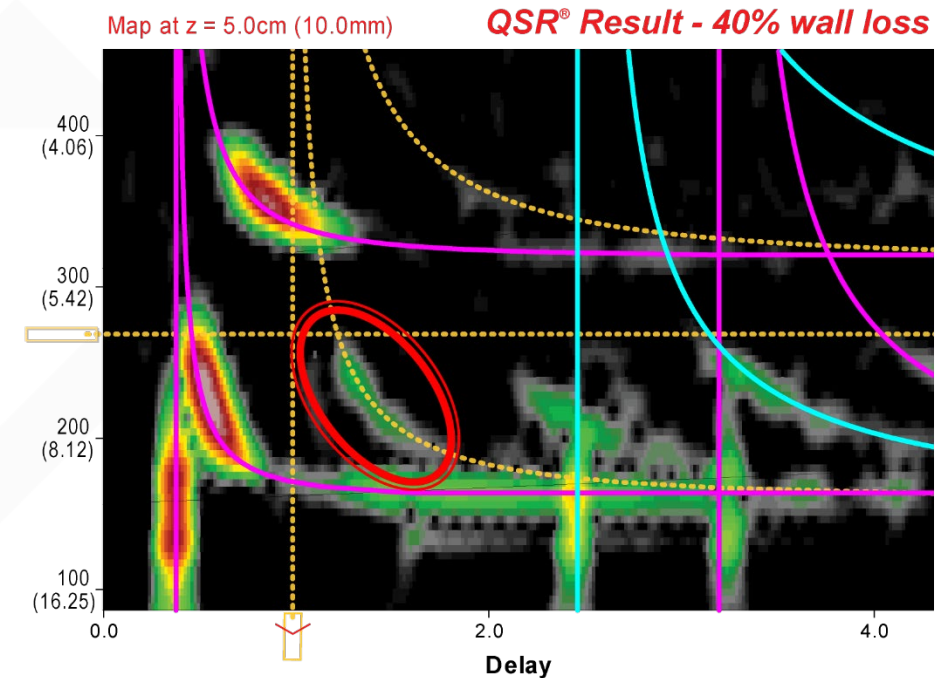
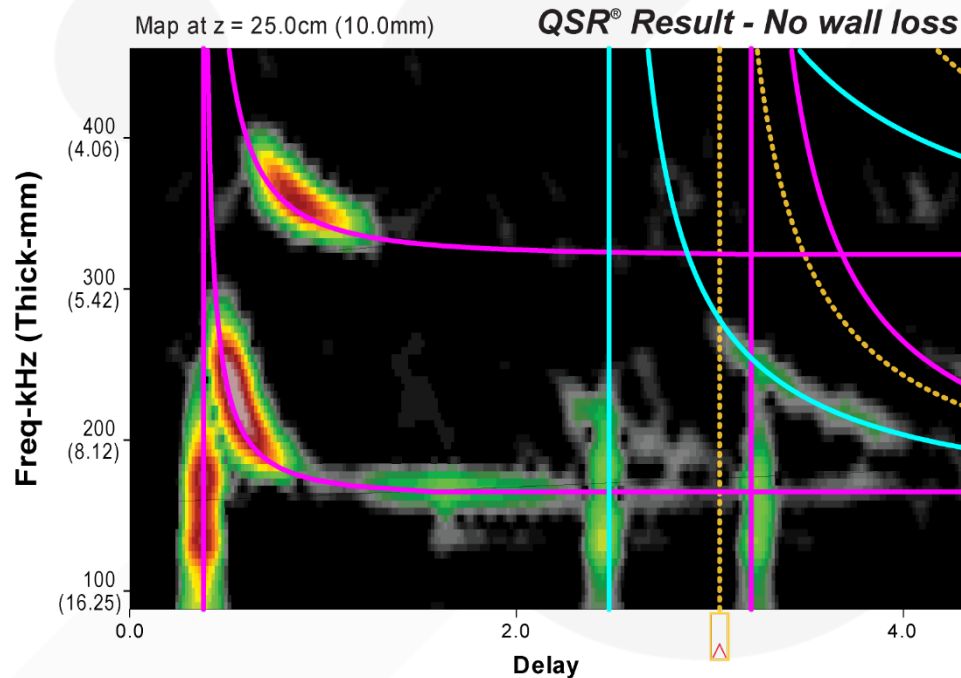
When there is no wall thickness loss, measured signals align with the expected SH0 and SH1 responses.

GUIDED WAVE SCANNING

MEASURING REMAINING WALL THICKNESS



- Thickness profile from prove-up scan of 6 o'clock indication identified through screening.
- **SH1 reflection** confirms wall loss and enables remaining wall measurement.
- Remaining wall thickness is measured by adjusting the yellow cursors to the reflection.



INTEGRATED GUIDED WAVE INSPECTION

INSPECTION OUTCOME

- ◆ Combining rapid full-length guided wave screening with targeted guided wave scanning proved highly effective for identifying and prioritising indications, and quantifying remaining wall thickness.
- ◆ Wavemaker[®] sensitivity was sufficient to identify indications along the full length of both lines, including highly localised 6 o'clock defects.
- ◆ QSR[®] proved effective in measuring highly localised, irregular wall loss, with beam coverage ensuring 100% POI and its low frequency removing the influence of defect geometry.
- ◆ Severe localised wall losses identified by Wavemaker[®] and quantified by QSR[®] were confirmed after removal as deep MIC-type pits.



GUIDED WAVE SCANNING

ADVANCING LARGE DIAMETER SCANNING

Building on experience gained through large diameter inspections such as this, **QSR[®]-ALF** was developed to make scanning quicker, lighter, and more flexible.

With this **Adjustable Larger-diameter Frame**:

- ◆ The sensor assembly does not include the ePOD, reducing the weight carried during scanning.
- ◆ The lighter sensor assembly can be positioned at any circumferential position where the coating allows magnetic attachment.
- ◆ The frame adjusts to accommodate pipe diameters from 12" upwards.





Technology you can trust.

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