Single sided weld inspection using Advanced Ultrasonic Methods

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INTRODUCTION

Reducers

Limited access

Flanges

Complex Joints
SINGLE & TWO SIDED EXAMINATION

Two sided inspection  Single sided inspection
INSPECTION TECHNIQUES

• Conventional PAUT - Linear Array
  • Tip diffraction
  • Third Leg inspection

• Advanced PAUT - Dual Matrix Array
ADVANCED PHASED ARRAY
SPECIMEN SELECTION

• 12.5 mm

• 20 mm
CASE STUDY OBJECTIVES

• Detect skew 90 side LOF's using various ultrasonic techniques from probe placement at skew 270.

• Sensitivity and signal to noise ratio comparison between methods

• Most appropriate ultrasonic weld examination methodology for one sided weld configurations.
CASE STUDY 1

12.5 mm
ADVANCED (DUAL MATRIC) ARRAY

LOF 1

LOF 2
TIP DIFFRACTION

LOF 1
Reference dB
+25dB

LOF 2
Reference dB
+25dB
THIRD LEG INSPECTION

LOF 1

Reference dB

Additional dB

LOF 2

Reference dB

Additional dB
ADVANCED (DUAL MATRIX) ARRAY

LOF 1

LOF 2
CONCLUSION

Tip Diffraction
- More additional dB required
- Poor signal to noise ratio

Third leg inspection
- Nominal dB required
- Mis positioning of defects

Dual Matrix Array
- Good signal to noise ratio
- Accurate positioning

Nozzle and exotic material
THANK YOU