

Application Note 002

Inspection of rubber lined metal pipes or vessels for disbonds

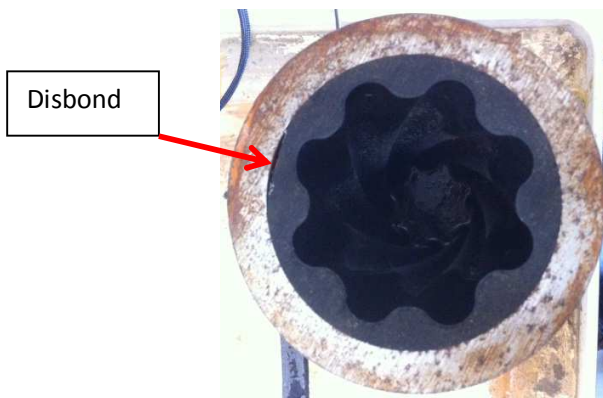
Motivation: Many metal pipes or vessels have rubber or other linings on the inside diameter for transport or mixing of certain fluids. There is a common requirement to be able to inspect the bonding between the metal and liner.

Principle: By using a transducer that can penetrate the rubber through the bondline, the amplitude of the interface can be measured with a flaw gate. Good bonding will attenuate the signal. A disbond will return a higher amplitude echo since the sound cannot now penetrate the rubber.

Challenge: Initial tests with a 5MHz transducer showed that we did not penetrate the rubber since a known disbond was not resolved. Therefore a lower frequency 2.25MHz was used with a composite construction to give better penetration and an improved signal to noise ratio. A dual-element was also required because of the curvature of the pipe; a single element was too sensitive to rocking of the transducer.

Solution:

- Raptor Imaging Flaw Detector
- RCA-10 or RCA-18 scanner
- Dual-element 2.25MHz composite transducer (1/4") Part No. AE07E06



Results:

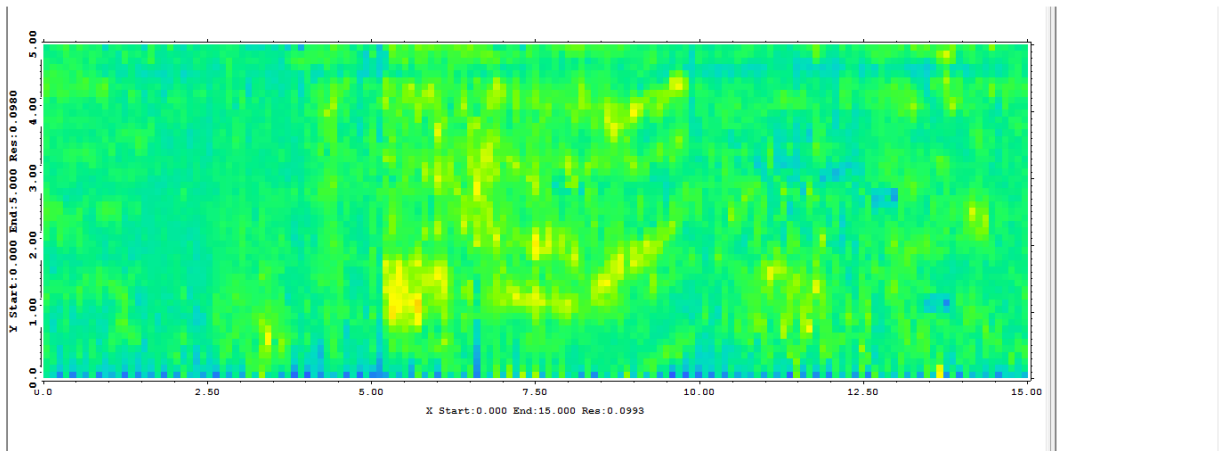


Figure 1. C-scan of pipe. Initial results using 5MHz dual-element. Variable shows % flaw gate height.

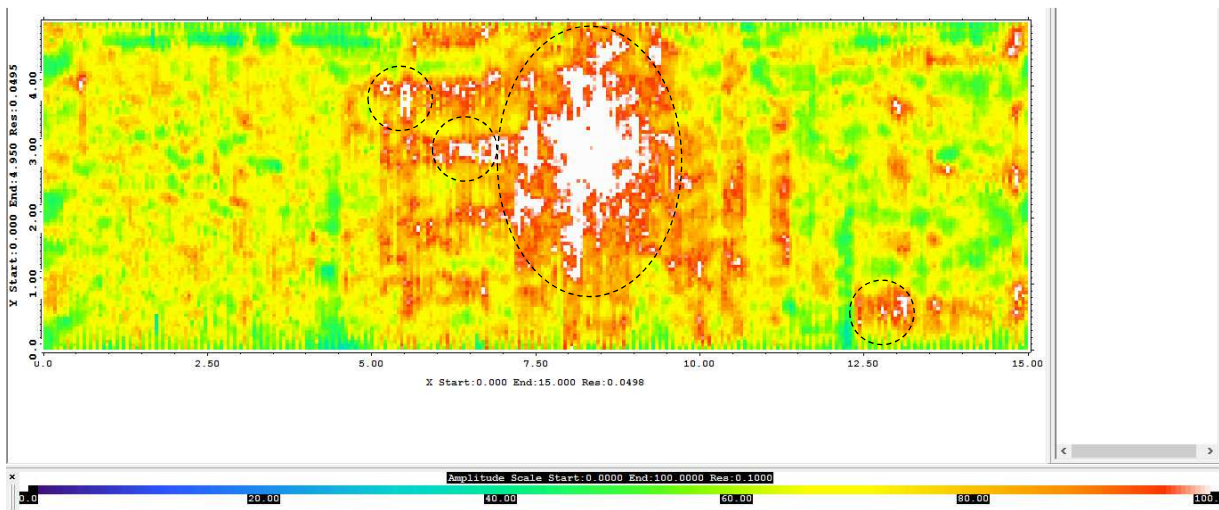


Figure 2. C scan of pipe using 2.25MHz transducer. Variable shows % flaw gate height.

Conclusion: Pipes and vessels with bonded internal liners can be inspected for disbands automatically using the Raptor and RCA-10 or RCA-18 and a low frequency composite dual-element transducer.