

# NDE Associates, Inc.

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## ECT for detection of Axial ODSCC: Case Study NDE 02-01

**Problem:** Detection of Axial SCC under supports in Inconel Tubes. Tube size  $\frac{3}{4}$  inch OD x 0.049 inch t (19 mm OD x 1.25 mm t)

**NDE Technique:** Multi-frequency Eddy Current Testing.

**Background:** A Feedwater Heater in a power plant experienced repetitive tube leaks during operation. Leaking tubes were plugged, however tube leaks continued.

NDE Associates, Inc. conducted Eddy Current Test of all the tubes. ECT test detected OD defect signals at the 2<sup>nd</sup> and 3<sup>rd</sup> supports in several tubes.

**Metallurgical Tests:** Sample tubes were pulled for metallurgical tests. The cracks were so tight that preliminary visual and Liquid Penetrant tests showed no indication of damage. Metallographic sectioning was performed to investigate the defect and determine the damage mechanism. Metallographic sectioning showed tight OD stress corrosion cracks (SCC) at the edge of supports. The length of the crack was 0.060 inches (1.2 mm). The width of the supports is  $\frac{3}{4}$  inch (19mm).

**Conclusion:** Multi-frequency ECT tests done with mixed channels detects extremely tight and short axial cracks under the supports.

**Company:** NDE Associates, Inc. is located in Houston. The company provides Eddy Current Services to Power and Petrochemical Industries.

**For Information:** Call Anmol Birring 281 488-8944 or visit [www.nde.com](http://www.nde.com)

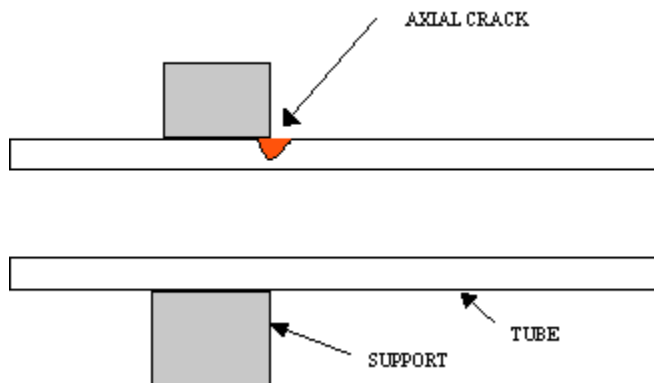


Figure 1. Axial ODSCC at the edge of support plate



Figure 2. Cross-section of the crack