

## Eddy Current Testing (ECT, including Eddy Current Array) Tube Inspections for Reliable Heat Exchangers

IRISNDT uses ECT (including Eddy Current Array) to detect pits, corrosion, erosion, cracking, and others, in stainless steels, brass, titanium, Inconel, copper, copper-nickel, and other non-ferrous tubes. This fast, accurate inspection technique has identified the flaws shown below.

### INSPECTION PREPARATION

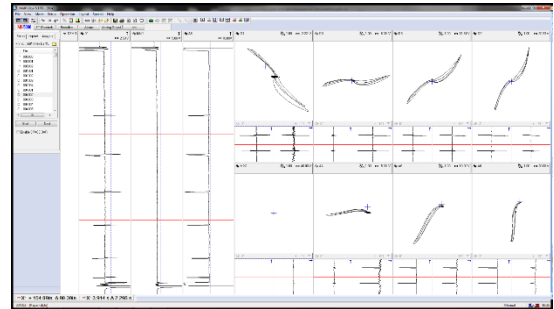
The tubes must be free of obstructions. However, the cleaning required is minimal.

### ADVANTAGES

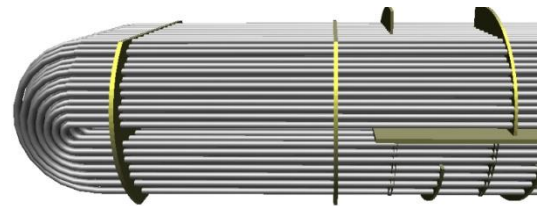
- This technique is fast with up to 4 ft/s pulling speed through tubes.
- Couplants are not needed. Consequently, contaminants are not introduced during the inspection.
- The technique identifies large and small volume pits.
- 100% of the surface of the tubes is inspected, with 360° coverage through the length. All the data is stored for review.

### LIMITATIONS

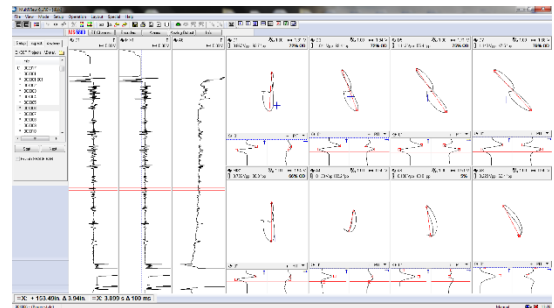
- With a traditional bobbin coil, circumferential cracks can be missed due to no disturbance in the flow of eddy currents.
- Ferromagnetic deposits on the tubes will lead to erroneous assessments.
- The probe needs a minimum 80% fill factor for maximum sensitivity to defects.
- The technique has a  $\pm 10\%$  variance in call accuracy assessments.



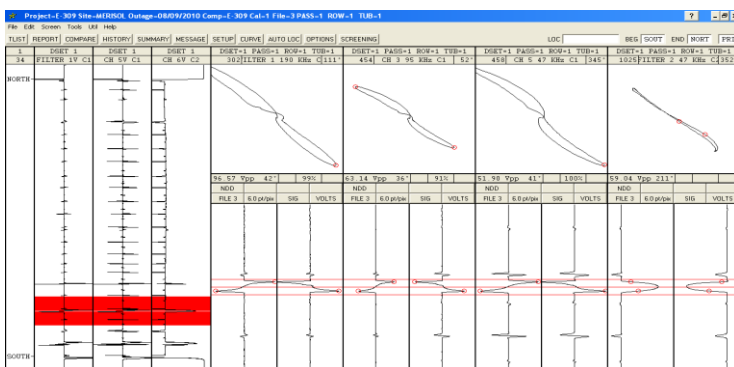
ECT baffle plate indication.



Baffle plate is indicated above.



OD pits ECT indications.



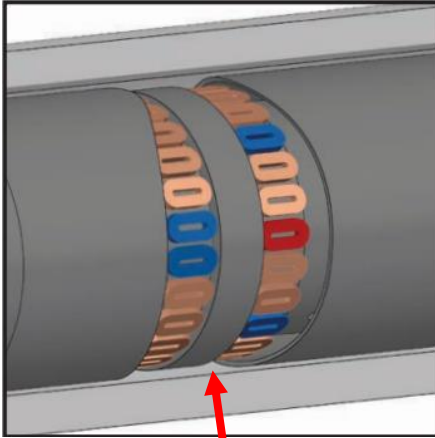
ECT signal of through wall crack on the right

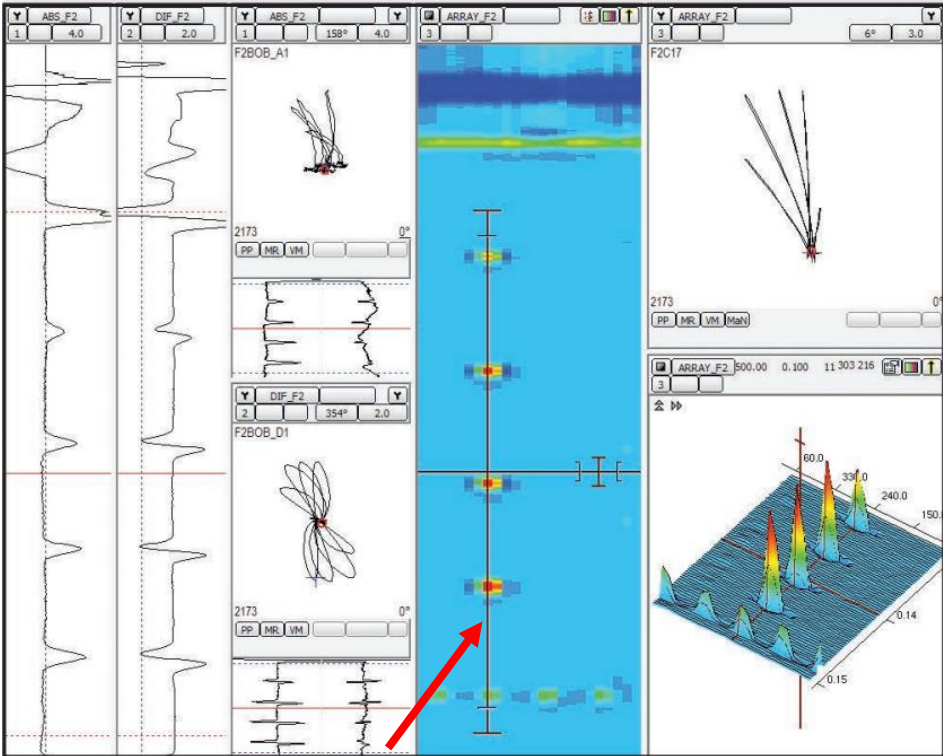


Through-wall crack in 1.0 inch x 0.109 inch stainless steel tube.

# IRIS NDT

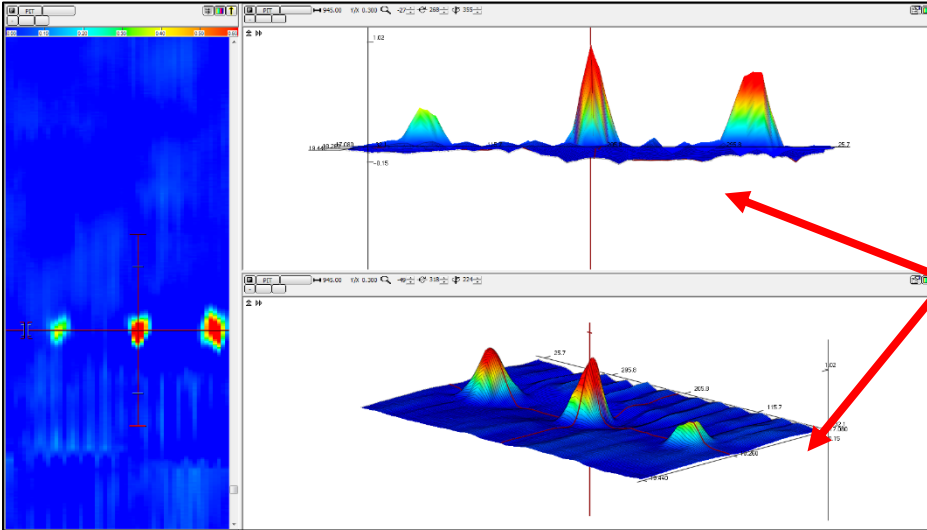
## Eddy Current Testing (ECT, including Eddy Current Array) Tube Inspections for Reliable Heat Exchangers





With Eddy Current Array, we can detect and size circumferential cracks. With the use of multiple coil topologies, all defects can appear perpendicular to the flow of eddy currents causing all defects to be easily identified and sized.

ASME calibration showing C scan imaging with Eddy Current Array of 4 x 20% Flat bottom holes



An advantage of Eddy Current Array over conventional Eddy Current is that one can see/resolve multiple defects all occurring at the same axial location of the tube. This allows us to easily differentiate which defect is deepest for more precise call accuracy.