FACT SHEET

TUBE EDDY CURRENT

Assuring system integrity, longevity and product delivery

Eddy Current Testing (ECT) is a well-established method of nondestructive examination that is used to inspect materials such as condenser and heat exchanger tubes in power generation and other industries which rely on the safety and efficiency of their assets.

Eddy Current Testing

The Eddy Current Testing (ECT) inspection technique has found a vast array of applicable uses, including heat exchanger tube examinations in recent decades.

ECT tube inspection development, speed, and accuracy greatly accelerated in the 1980's and 1990's with the Nuclear Power Generation requirements to inspect safety related steam generator tubing and other critical components at Nuclear Power Plants.

These improved techniques have become more commonplace, such that with decades of experience and equipment refinement, the benefits of ECT tube inspection are now realized in many sectors to be of great value including fossil power, oil and gas, and chemical processing among others.

Applications

With over 40 years of experience inspecting and evaluating tubes in nuclear steam generators and other nuclear power heat exchangers, we have also found ECT tube examinations to be particularly successful during inspection of non-nuclear heat exchangers found in fossil fuel plants such as main steam condensers, feedwater heaters, lube oil coolers, to name a few.

Additionally, we have inspected heat exchanger tubing in many other sectors to include Pharmaceutical, Food and Beverage, Oil & Gas, and Renewable Fuels.

One of the many benefits of performing ECT tube inspections in the non-nuclear sector using nuclear experience, equipment, and software tools we maintain is the speed and accuracy of the ECT examinations.

Benefits

This allows for very accurate inspection results within short inspection/outage windows, minimizing plant down-time while maximizing the efficient life of the heat exchanger.

Alongside with the Intertek Mechanical and Metalurgical Engineers, including years of experience with tubing and heat exchanger condition monitoring and degradation assessment, along with our Metalurgical Lab and destructive analysis experience and capabilities, we can with high confidence assess damage mechanisms, growth rates, and overall remaining life using the ECT results and our Engineering team.

FOR MORE INFORMATION

aimengineering.sales@intertek.com

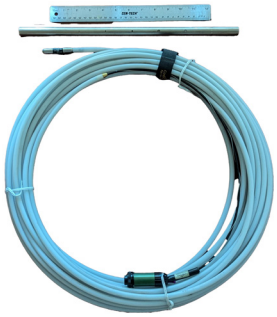
intertek.com/aim

TUBE EDDY CURRENT

System & Process

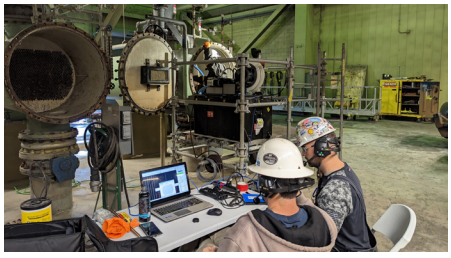
The ECT examination system can be used to inspect almost any material and size tubing.

Step 1 – Planning: Once the tube size and material are known, the ECT Level III calculates the overall examination technique specifications needed to include the probe type and size, along with the required type of calibration standard.



Typical Calibration Tube & Probe

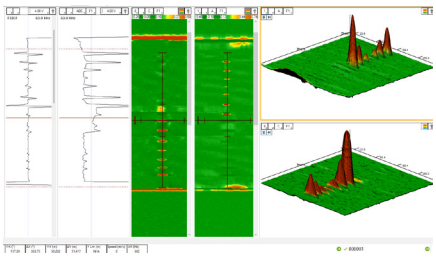
Step 2 – Data Acquisition: The ECT Data Acquisition crew inserts probes using a digital ECT system and an automated probe driver down and back through each tube, uploading data from each tube real-time to the Data Analysis crew.



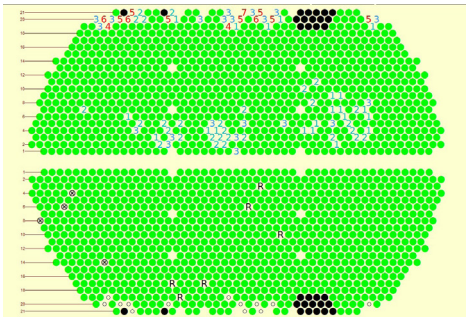
Typical Data Acquisition Station

ECT excels particularly well when it comes to inspecting feedwater heater tubes, finned tubes, condenser tubes, and just about any size tube or component susceptible to ID or OD damage.

Step 3 – Data Analysis: The Analysis crew scrutinizes the data for quality and completeness while evaluating and recording the condition of each tube to include location, depth, and degradation characteristics.

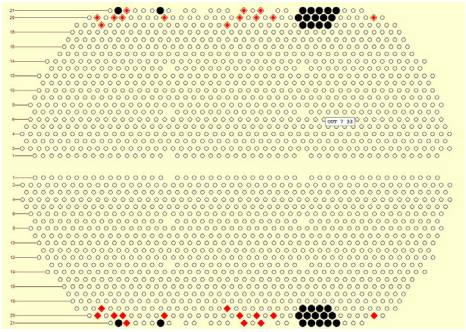


Step 4 – Preliminary Reporting: The Analysis crew provides daily preliminary reports as needed and works with the client to determine tubes in need of repair or plugging.



Preliminary Results Map

Step 5 – Tube Repair: Once tubes are selected for repair or plugging, a plugging map is generated and provide to the plugging crew.



Plugging Map

Step 6 – Final Reporting: Following site activities, a formal and complete Final Report is prepared and delivered to the client to include current findings and repairs along with recommendations for degradation mitigation and future inspection cycles.

Classification by Damage Type	# of Tubes
Total As-Built Tubes	3708
Total Tubes Inspected Full Length	624
ODD (outside diameter freespan damage)	11
ODS (fretting at supports/baffles)	20
IDD (inside diameter damage)	624

Classification by % of Wall Loss	# of Tubes
Total As-Built Tubes	3708
Legacy Plugs	5
Total Tubes Inspected Full Length	624
Restricted (Partial Test)	85
No Detectable Degradation	0
Dent	1
10-19% Wall Loss	17
20-29% Wall Loss	180
30-39% Wall Loss	405
40-49% Wall Loss	159
50-59% Wall Loss	14
60-69% Wall Loss	3
70-79% Wall Loss	1
80-89% Wall Loss	1
90-100% Wall Loss	2

Examples: Results Tables