

## **NEAR FIELD™ INSPECTION OF FERROMAGNETIC HEAT EXCHANGER TUBES**

M. O'Connor

Eddy Current Technology Incorporated, Virginia Beach, VA, USA

Near Field™ testing of ferromagnetic heat exchanger tubes is a new technique. In Near Field™ testing of ferromagnetic heat exchanger tubes, the electromagnetic field is generated close to the receive coils of the probe; therefore, does not suffer from the same problems that Remote Field testing of ferromagnetic tubes does.

In Remote Field testing, the field is generated by one or two send coils located approximately three tube diameters from the receive coil. The electromagnetic field travels from the send coil through the tube wall, along the outside of the tube wall, and then back through the tube wall close to the receive coils. Any metal item between the send and receive coils, such as tube sheets, support plates, and aluminum fins block the field's path, significantly reducing the sensitivity to defects where these blockages occur.

Because the electromagnetic field in a Near Field™ probe is generated close to the receive coils, the signal travels from the send coils outward through the tube wall and back to the receive coils, without having to travel along the length of the tube; therefore, the electromagnetic in Near Field™ eddy current testing is not blocked by tube sheets, support plates, and aluminum fins. As a result, Near Field™ eddy current testing has the ability to accurately measure defects close to support plates and in tube sheets. It also has the ability to detect holes in the support plates and the ability to inspect ferrous tubes wrapped with aluminum fins.

This report discusses the above and other advantages of Near Field™ testing of ferromagnetic tubes. For additional information, please go to our website at <http://www.eddy-current.com> and click on Technical Information on the home page.