CARBON STEEL INSPECTION, INC
VERSA INTEGRITY GROUP

CSI Tech Brief

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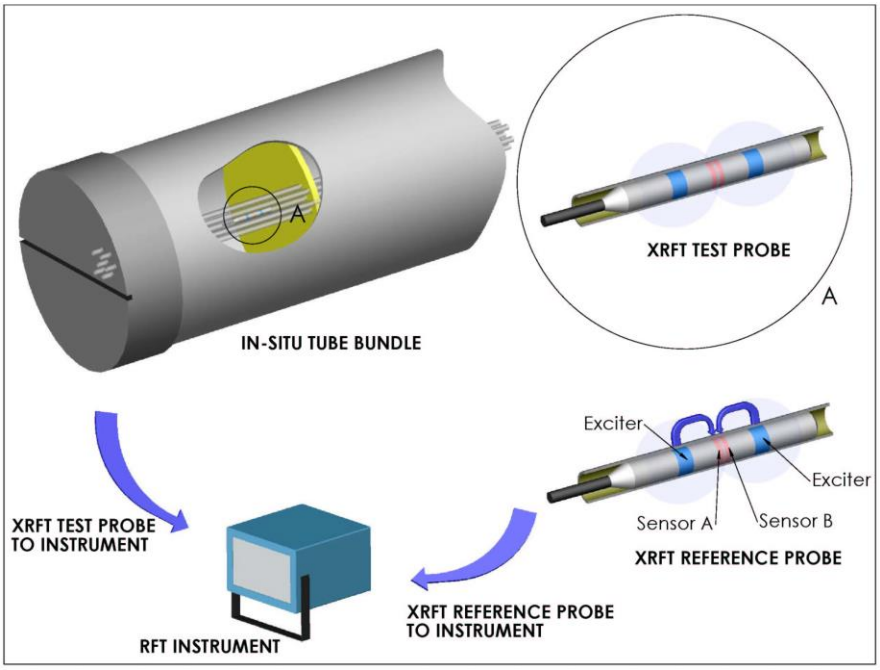
What's It All About?

At Carbon Steel Inspection, Inc. we are often asked to provide a general background description of our Externally Referenced Remote Field Technology, a new technology developed by CSI. This tech brief strives to maintain a clear and defined technical description of the XRFT method.



DEFINITION

Externally Referenced Remote Field Technology (XRFT) is an electromagnetic technique that utilizes the Remote Field phenomena to create a naturally balanced system by using an external reference to reduce the effects of unwanted noise.

XRFT GENERAL DESCRIPTION

XRFT is an electromagnetic testing technique used primarily for in-service ferromagnetic tube, pipe, or plate inspections that otherwise produce a greater amount of noise from a conventional remote field test. The noise can be from any unwanted signature or electrical source that masks the desired flaw response by much larger amplitude than the flaw response. Some sources of noise are aluminum fins in air cooler fin fan applications, carbon steel fins in economizer or waste heat boiler tubes. These external structures or attributes of the tube cause a disruption to the natural magnetic field flow path known as the through wall transmission effect. This disruption causes or induces a large offset in the sensor coils especially in the absolute coil of a RFT probe. In piping applications the long runs often result in drifting due to permeability changes.

The solution is simple. Similar to conventional eddy current, attach a second probe that is stationary in a reference tube. The tester now compares or differentiates the test probe input to the reference probe input creating a balanced system that has reduced unwanted noise. It is important to have the reference probe be placed in a tube that is comparable to the insitu-tube so the noise can be eliminated. A near balanced system is created because the naturally unbalanced condition generated by the induced voltage of an RFT test probe is now being subtracted by an identical induced voltage from the reference probe that is in phase and voltage.

Now when the test probe traverses a flaw it will no longer be masked instead it can be seen on the output display in differential and/or absolute modes.

The RFT technique dictates the test parameters – frequency, probe drive and gain as well as traverse speeds and field adjustments. Sensitivity and resolution will need to be determined because most XRFT applications cannot be successfully conducted using standard RFT methods.

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