



Internal Rotating Inspection System

Introduction

MISTRAS Group's Services Division offers a complete range of inspection, training and QA/QC services. We integrate innovative technologies with conventional testing methods to assure the integrity of industrial materials and components as cost effectively as possible.

Current Condition

Presently, the Internal Rotating Inspection System (IRIS) is one of the most effective ultrasonic inspection systems in use. The system was developed to inspect heat exchanger tubes, especially air cooler exchangers (Fin Fans). This technique uses a water driven rotating mirror to direct an ultrasonic beam, which is reflected 90 degrees to the internal tube wall (See Figure 1).

The water column generated by the probe assembly acts as a water couplant and transmits sound waves from the ultrasonic transducer to the tube wall. The ultrasonic transducer is mounted axially in the tube and the beam is directed toward the mirror, which is placed at a 45-degree angle to the transducer. The mirror is supported on a water driven turbine that spins on an axis parallel with the probe axis. Using special ultrasonic electronics a B-scan pattern of the (cross-sectional profile) tube wall is presented (Figure 2). This presentation can also be displayed in a B-scan or C-scan showing tube wall thickness and isolated corrosion areas along the tube length.

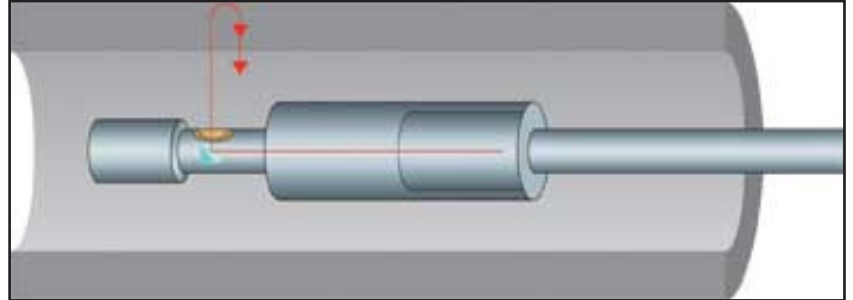


Figure 1

Application Solutions

MISTRAS Services provides highly qualified IRIS technicians for on-site and in house data analysis interpretation, utilizing the most advance state of the art software for IRIS testing (Multi-Scan MS 5800 / Figure 3). The equipment allows the technician to accurately and confidently inspect any tubing in Real-time, by allowing full length recording capabilities. This allows Data Analysis to be performed offline in order to assess damage with the customer.

IRIS Applications:

- Heat Exchangers
- Boilers
- Air Coolers
- Feedwater Heaters

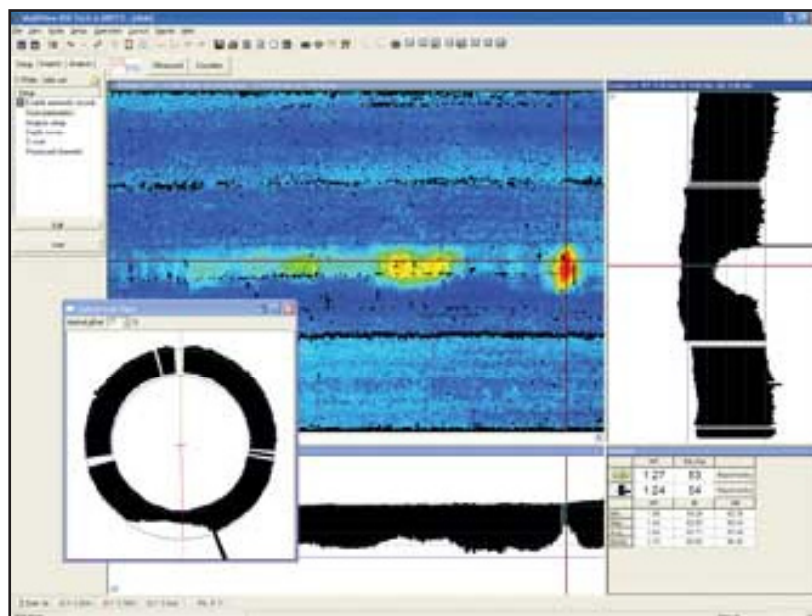


Figure 2

Applications Advantages:

- Inspection of Ferromagnetic and nonferromagnetic tubing.
- Provides accurate wall thickness readings.
- Can distinguish between I.D. and O.D. defect orientation.
- Allows detection and sizing of wall loss such as corrosion, pitting, erosion and baffle wear.
- Can inspect .500” up to 3” diameter (larger size with special probe design).
- Can be used as a backup technique with RFT, NFT and/or MFL inspection.
- Inspect approximately 250 to 300 tubes in an 8 hour day (based on exchanger length of 20ft).

Requirements and Site Preparation:

- Tubes must be cleared of all I.D. loose scale and deposits.
- Hydro-blast (10,000 to 25,000psi/depending on material type is common practice). Grit blasting is optional.
- 110 AC power supply and water source with a minimum of 50 psi.
- Customer safety requirements in plant or unit.
- Tube information is critical (U-1 Spec. Sheet) to ensure proper equipment is used for the project.

Reporting:

- Formal report contains cover sheet, table of contents, introduction, executive summary, tube sheet layouts, data summary sheets, detail data sheets, printouts of graphics, etc.

MISTRAS Group, Inc. is a team of skilled researchers, engineers, technicians and manufacturing personnel dedicated to the development of practical and cost saving solutions to meet your challenging inspection needs.

For assistance or additional information, please contact our main headquarters at 609-716-4150 or via email at sales.services@mistrasgroup.com



Figure 3

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