

## HEAT EXCHANGER TUBE INSPECTION

### THE PROBLEM

Heat Exchanger tubing can suffer from a wide variety of problems in service, the nature of which is usually characteristic of the material and application. Typical problems found include the following.

- Pitting corrosion
- Fretting at the baffle plates
- Impingement attack
- Mechanical damage

If these problems occur and remain undetected, they can often develop into leaks which more often than not result in an enforced shutdown. Such a scenario is usually very inconvenient and can often be quite costly.

### THE SOLUTION

By carrying out appropriate tube inspection surveys on a periodic basis, e.g. annual shutdowns, it is possible to identify both internal and external defects in the tube wall before they lead to failure.

Having done so, tubes which are considered to be "at risk" can be plugged off or replaced before the unit is returned to service. In so doing, a much higher level of confidence in the reliability of the heat exchanger can be achieved and an unplanned shutdown avoided.

Yimpact Heat Exchanger Services offers a choice of three tube inspection systems to suit the tube materials normally used in the manufacture of heat exchangers.



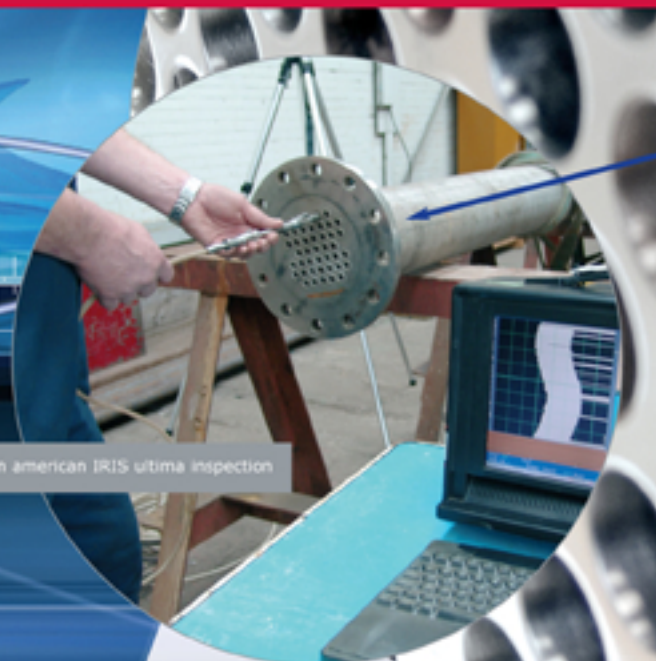
face of tubeplate



tubes



close up



pan american IRIS ultima inspection

### PAN AMERICAN IRIS ULTIMA INSPECTION

This ultrasonic tube inspection system can be used on both ferrous and non-ferrous materials.

- Inspects tubes from 9mm to 40mm internal diameter.
- Measures remaining wall thickness down to 0.5mm.
- Measures internal pitting down to 1.5mm dia.
- On screen wall thickness measurement. Results stored on IBM disks.
- Provides detailed information with regard to condition and thickness of tubes, eliminates guess work and percentage measurements.



## EDDY CURRENT TUBE INSPECTION

Both single and dual frequency eddy current systems are available for the inspection of copper, copper alloy and other non-magnetic tubes used in a wide range of heat exchangers; from the smallest oil cooler to the largest Power Station main condenser. Inspection probes are available for the most common tube sizes used in this type of plant, for example, 9mm to 38mm o.d.

The process which can detect both internal and external metal loss, is widely used in the following industries:

Chemical, Petro-Chemical, Oil Refinery, Power Generation, Shipping, Desalination and Air Conditioning.

Some of the typical problems which can be identified include:

- Internal/external corrosion
- Internal erosion
- Indensable gas attack
- Vibration damage
- Steam erosion

## DINSEARCH TUBE INSPECTION

The Dinsearch 1-00 series modular equipment is specifically designed for the in-situ inspection of carbon steel tubes in heat exchangers, gas coolers and boilers.

The system uses an established and proven electro-magnetic technique which will detect pitting, general corrosion, wear under baffle plates and thinning caused by erosion or corrosion; the defect most commonly occurring in steel tubular heat exchangers and boilers. It will detect internal and external defects, but like other tube inspection techniques, will not necessarily detect leaks. With typical tube material, the equipment will resolve 1mm diameter pits and 2% loss in wall thickness.

Inspection probes are available for tube sizes from 16mm to 75mm o.d. (5/8" to 3" o.d.) and for the normal range of wall thicknesses encountered in boilers and heat exchanger tubes.



shell thickness measurement

## HEAT EXCHANGER TUBESHEET/SHELL THICKNESS MEASUREMENT

TEI Yimpact utilise Panametrics 36DL Plus Ultrasonic thickness testing equipment to determine accurate thickness measurements of the tubesheets/shell of heat exchangers and general pipework.



D.P.I. and M.P.I. services

## OTHER SUPPORTING SERVICES

These services include:

- Individual pressure testing of tubes.
- Tube removal/replacement
- Supply/fit "dummy tubes"
- Supply/fit taper plugs, mechanical plugs, explosive plugs.
- Metallurgical Investigation
- D.P.I. and M.P.I. services



pressure testing



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