

## Detection of Flow-Accelerated Corrosion



Intertek offers examination performed through insulation online or offline. Pulsed eddy current is a proven technology successfully used by clients throughout the world.

### What is Flow-Accelerated Corrosion?

Flow-accelerated corrosion (FAC) is metal loss through the dissolution of the protective oxide film in piping serving water or wet steam. Many pipe failures caused by FAC have been reported in power plant piping systems. Under certain water chemistry, fluid velocity, and operating conditions, FAC can cause internal wall thinning of condensate and feedwater piping, heater drip and drain lines, and other carbon steel piping. In some cases, this thinning has led to catastrophic failures and fatalities.

### Why Be Concerned?

All personnel are concerned about safety and the consequences of a high energy piping failure. Whether a power plant remains with a utility or is purchased by a new owner, assessment of the damage that can result from FAC is a relatively inexpensive and prudent prevention measure.

### Intertek's Approach to FAC Examination

Our experience with FAC has led to the development of the following steps for proper evaluation:

- Computer software to identify and rank high priority areas
- Online or offline non-intrusive examination of high priority areas
- Ultrasonic examination of selected locations
- Engineering analysis

### Non-Intrusive Inspection Technology

A unique feature of Intertek's approach is our non-intrusive wall thickness measurement service which uses a patented pulsed eddy current technology.

The pulsed eddy current system is especially attractive to many industrial and power plant



Cross Section through the Elbow  
Viewed with the Flow

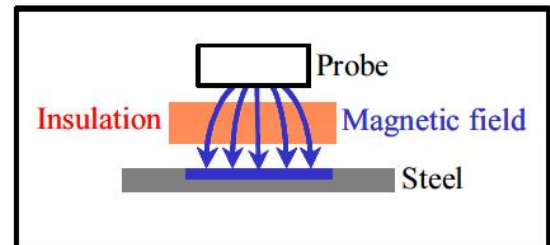


Figure 1 Picture of a PEC instrument and a probe placed on an insulated pipe

### Intertek

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clients because it can be used:

- While the plant is online or offline – no outage required
- Without removing insulation and lagging
- At a substantial cost savings, particularly when asbestos is present
- The field performance is excellent
- Wall thickness accuracy: better than  $\pm 5\%$
- Pipe temperature:  $-150^{\circ}\text{F}$  to  $950^{\circ}\text{F}$
- Insulation thickness: 0 to 4 inches
- Pipe wall thickness: 0.15 to 2.6 inches

## Pulsed Eddy Current: Expanded Capabilities and Availability

Intertek has expanded its capabilities in doing Pulsed Eddy Current evaluations using a next generation technology. Previously we had longer than desired lead times due to demand and availability. We now have additional units to employ at your facility and can be more responsive and accommodating than in the past.

Typical applications:

- Feedwater Heater Shells
- Deaerators
- Feedwater Piping
- Boiler Tubes
- Cyclone Tubes
- Refractory Boilers
- Tanks and Vessels
- Corrosion Monitoring of 0.2% of Known Problem Areas
- Precision Wall Thickness Monitoring to Extend Runtime
- Inspection of Storage Sphere Legs through Fireproofing
- In-Service Inspection of Annular Rings of Storage Tanks

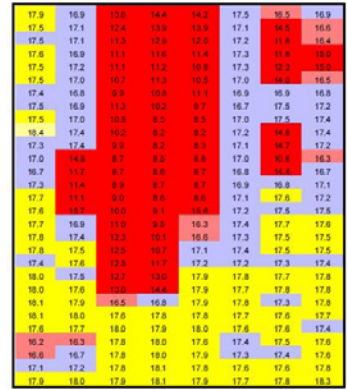
We recently held a webinar on Flow Accelerated Corrosion and Pulsed Eddy Current evaluations. If you are interested in getting a copy of this, email Kent Allen (kent.allen@intertek.com).

## PEC Advantages

- Online or offline wall thickness readings through insulation
- Avoids insulation removal/installation costs
- Single mobilization can include examination of several units at a plant or nearby plants
- If online examination prior to outage:
- No interference with other work during the outage
- FAC or CUI NDE is no longer a potential critical path of an outage
- Fitting replacement can be identified and planned ahead of the outage



Inspection in progress – the operator places the probe on the insulation cover to inspect the steel underneath



Example of a result: Colour-coded wall thickness graph. Areas with wall loss are coloured red.