

Energy From Waste Wall Loss Monitoring

In-service, high-temperature, high-precision corrosion monitoring of critical assets in UK Energy Recovery Facility (ERF).

Key Deliverables

- **Confidence in safe operation:** The integrity and process teams can now operate the asset with confidence that it is within safe limits, with far less uncertainty about its condition.
- **High-precision data without access:** The TRND Measurement Hubs deliver frequent, high-precision wall-thickness readings without removing lagging or accessing the asset.
- **Early detection of change:** Any change in wall loss can be detected and linked to the process events that would otherwise force a shutdown.
- **Fewer outages, lower cost, safer inspections:** Outages and inspection costs are down, and inspector safety has improved.

Overview

A UK energy-from-waste (EfW) plant was unsure of the condition of its deaerator. These components are integral to the steam generation process within the Energy Recovery Facilities (ERF) across the fleet, converting waste. With a zero-corrosion allowance, any loss of wall thickness forces an immediate shutdown, and because the plant runs varying feedstocks under fluctuating conditions, the impact on the vessel's integrity was unknown and a significant business risk. Previously, due to limited access and thick insulation, risk-based inspections (RBI) were only feasible during shutdown periods. Continuous monitoring now provides routine, high-precision wall-thickness trends, giving assurance that the asset stays within its integrity operating windows (IOWs) and that a corrosion-driven shutdown can be foreseen.

The Challenge

- The assets are large diameter pressure vessels that operate continuously up to 190 °C.
- Key inspection locations were identified from historical ultrasonic (UT) data.
- A high-precision continuous monitoring system was needed to trend wall thickness across a series of thickness monitoring locations (TMLs), without access the vessel or removing its lagging.

The Solution

- Fixed-point HotSense™ 380 sensors with a solid couplant were chosen to survive the conditions and deliver stable, reliable thickness measurements, with a detectable wall loss of ± 0.025 mm.
- The welded-stud deployment system was used to mount sensors at the thickness monitoring locations across each large-diameter vessel.
- The HotSense™ sensors were connected to TRND Measurement Hubs, allowing quick, simple readings from easy-to-access connection points to get started before upgrading to a wireless solution. Data from the hubs were collected and verified using a commercially available thickness gauge.
- The system was deployed, and measurements were collected by the incumbent NDT service provider, Apave UK, who provided traceability and compliance to relevant procedures while expanding their service offering with the technology.



The Execution

- Apave UK deployed the solution during a short shutdown of under 49 hours.
- 16 sensors with thermocouples for accurate temperature compensation were installed under the insulation, together with TRND Measurement Hubs.
- Since installation, stable and repeatable measurements have been collected, with temperature compensation applied by the gauge.
- Wall-thickness data is now collected frequently by inspection technicians while the plant is on-stream, ahead of an upgrade to an autonomous wireless solution.