Thompson Industrial Services
A Clean Harbors Company

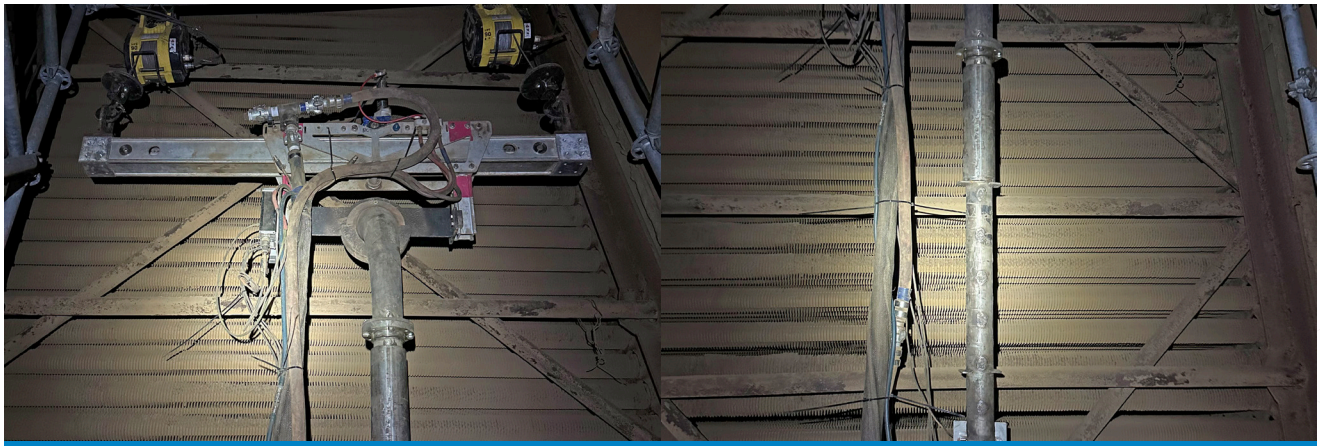
Case Study: EPIC Incinerator Cleaning Results

The Problem

A large chemical production facility in Pasadena, TX, had been experiencing extremely high stack temperatures (between 700°F and 800°F) for several years in their thermal oxidizing incinerators. The extended operating time at these excessive temperatures caused several issues due to the materials of construction of the incinerator internals, including warping of tubes, damage to interior lining and fracturing of support components. Production throughputs had been decreased over time, as well, to prevent the temperatures from rising any higher. These incinerators also generate steam for use within the production processes and for internal sale to other entities within the fence line. The plant had been affected by significantly reduced steam production due to a loss in heat transfer efficiency.

The issue was a direct result of excessive accumulation of foulants on the outer diameter of the finned tubes within the units. Several attempts to clean these tubes had been made using a high-volume water flush, but this method was unsuccessful, especially at reaching tubes deep within the bundles. The water exposure also led excessive oxidation deposits on the tubes, further impacting the heat transfer effectiveness.

Thompson Industrial Services, a Clean Harbors Company, was contacted to determine if the patented EPIC® Extraction Pressure Impulse Cleaner technology, utilizing repetitive and directly targeted pressure waves, would be a potential solution to fracture and dislodge material embedded within the tube fins. The cleaning project for Unit #2 commenced on August 13, 2024, followed by Unit #1 on September 25, 2024.



Pictures above provide examples of the condition inside the incinerator prior to the cleaning.

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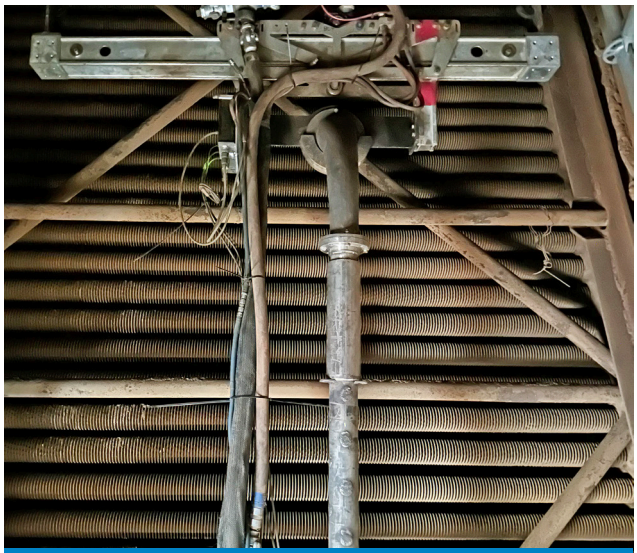
The Process

The EPIC® process was utilized to clean these tubes, assembled as seen in the pictures on previous the page–utilizing a 2.5″ detonation tube and specialized mixing head/igniter, creating an optimum feed of ethylene gas and compressed air to create a detonation. As the pressure travels through the tube, the blast pressure transitions to a pressure wave that travels through the tube module. At each location, the EPIC® process is automatically and remotely controlled through the use of a programmable logic controller, which creates 120 blasts every two seconds. These waves safely, effectively and efficiently dislodge the deeply embedded solids from the tubes, where they can be cleaned from the unit floor by use of a dry-air-mover vacuum truck. This process was completed at the six faces of the three tube bundles, cleaning all bundles from both the upstream and downstream side. The entire process took three day-shifts to complete, with the post-vacuuming operations occurring during night shift.



The picture above presents the tube bundle after the EPIC® cleaning was completed.

The Results

1. Immediately upon the incinerator's restart, the plant saw their stack temperatures decrease from the 750°F starting point to 420°F, with a nearly 40% increase in production throughput achieved while still maintaining this target temperature.

2. Heat transfer efficiency for steam production increased by 15%, realizing a direct savings of $516,000 annually and giving a nine-month payback on the total investment of the EPIC® cleaning of both units.

3. The plant anticipates that, based on these results, they can extend the time between planned incinerator turnarounds from two to three years to 5 years or more.

4. With reliability of these units critical to the plant's operations, the reduced stack temperature has alleviated concerns of unplanned downtime due to mechanical or metallurgical failures.

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or Scan the QR Code

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