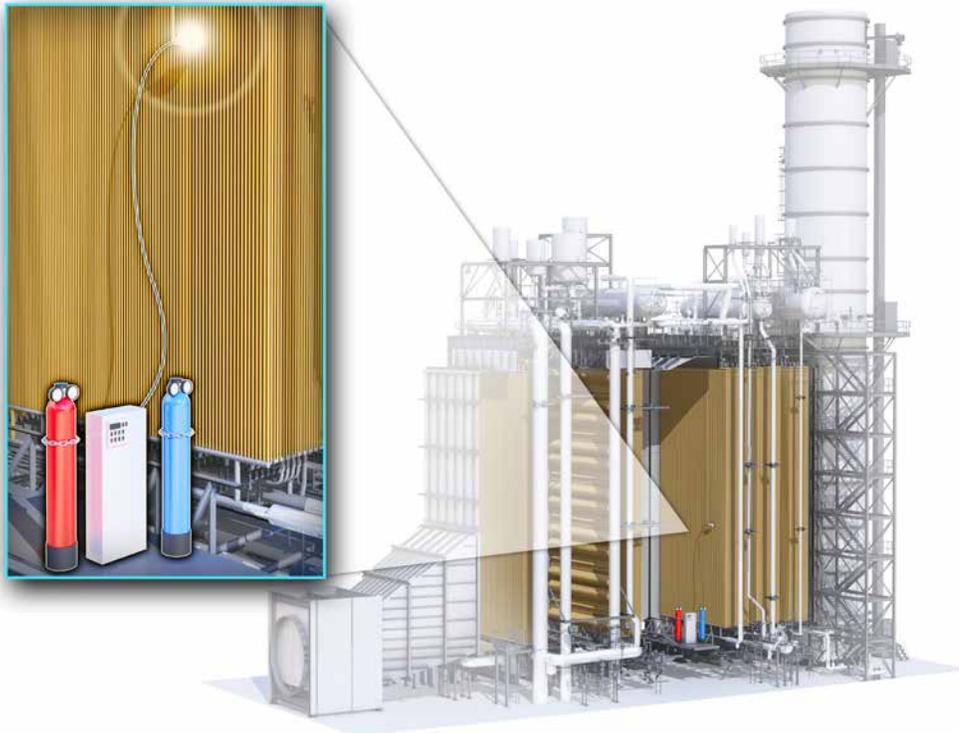




# When is a 28,000 pound pile of rust a good thing?

When it comes from the inside of a heat recovery steam generator (HRSG).

**GE's PressureWave Plus\* removes more than 14 tons of debris from a portion of one HRSG, resulting in \$500,000 in value from fuel savings and/or increased power generation.**



Initially, the plant tried an alternative cleaning method to remove the corrosive material. This cleaning method removed three tons of debris from one HRSG. **The plant went back online and continued to experience back pressure that was higher than expected.**

Still seeking a solution to resolve their back pressure issue, the plant turned to GE's PressureWave Plus HRSG cleaning technology during a mini-outage in the spring of 2016. **Working six shifts over the course of three days, two crews of GE experts cleaned four modules of one HRSG, removing more than 14 tons of additional debris from the "already cleaned" unit.**

Results were immediately noticeable upon restarting the unit. Gas turbine back pressure dropped approximately 8 inches, and the stack temperature decreased 30°F. **This resulted in an estimated value of \$500,000 in fuel savings and/or increased power generation.<sup>1</sup>**

Recently, GE was called into a combined cycle plant in the southeast US to address a common issue facing HRSGs nationwide: gas-side tube fouling on the cold-end modules of the unit. Tube fouling can considerably lower the power output and efficiency of a combined cycle power plant from the reduced heat transfer efficiency and increased gas turbine back pressure.

The plant was experiencing significant gas turbine back pressure following an extended outage. An inspection revealed fouling of heat transfer sections downstream of the selective catalytic reduction (SCR) due to oxidation and accumulation of debris in the modules.

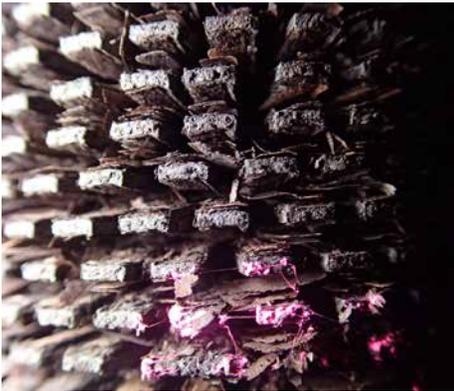


Debris after cleaning

Pressure wave cleaning is a patented technology<sup>2</sup> and process carried out with a special lance that is inserted into the access lanes between the tube bundles in an HRSG. A bag at the end of the lance then is inflated with a mixture of combustible gases that are remotely ignited. The resulting pressure wave and tube vibrations dislodge the deposits without damaging the boiler tubing. This process requires no scaffolding and entails less work in confined spaces.

The plant is so satisfied with the process and results that they have contracted with GE's Power Services to clean additional HRSGs in the fall of 2016.

1. Estimated value is based on F-class unit running 3,000 hours at full load and 3,000 hours at low load with \$3/MMBtu natural gas costs and \$40/MWh.
2. Pressure wave technology developed by BANG&CLEAN® Technologies AG



Before Cleaning



After Cleaning

### Cleaning Method

Steps in the cleaning process



Lance inserted

Bag placed in cone

Bag inflated

Bursting bag

### Benefits

- Applies to all HRSG types
- Requires no scaffolding
- Cleans deeper into the tube bundle, as well as areas that cannot be reached by other technologies
- Provides more effective cleaning than traditional CO<sup>2</sup> blasting
- Cleans in half the time, as compared to other methods
- Mobilizes quickly
- Reduces gas turbine back pressure
- Improves heat transfer
- Is cost competitive
- No waste water generated

To learn more about this offering, contact your GE sales representative or visit [powergen.gepower.com](http://powergen.gepower.com).

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