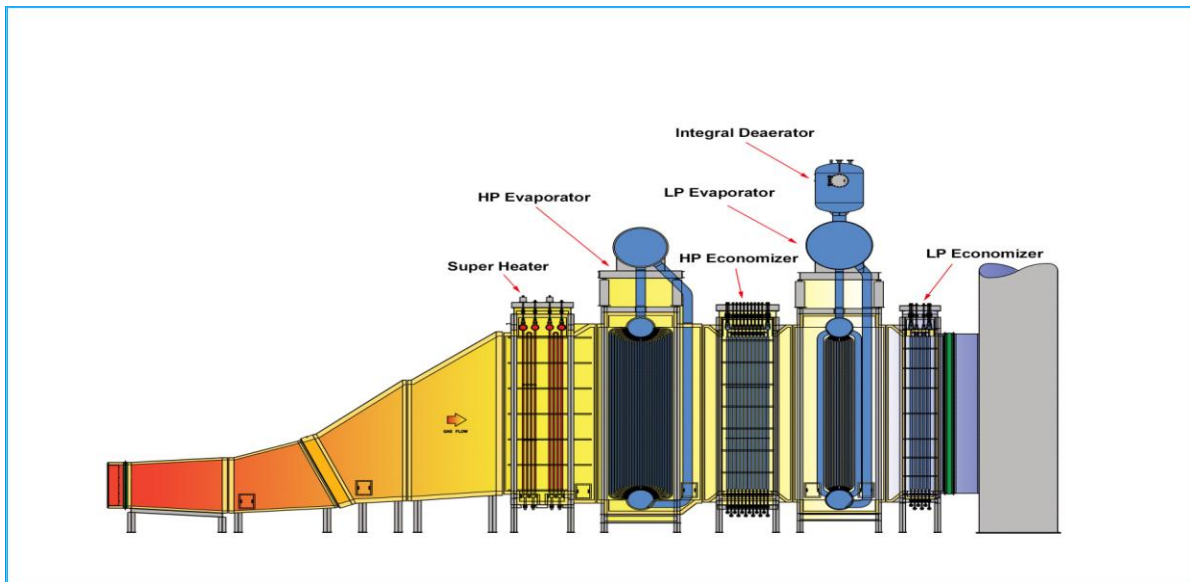


**On-Line dry chemical cleaning
of
HRSG
(Heat Recovery Steam Generator)**
Time of Project: January 2019

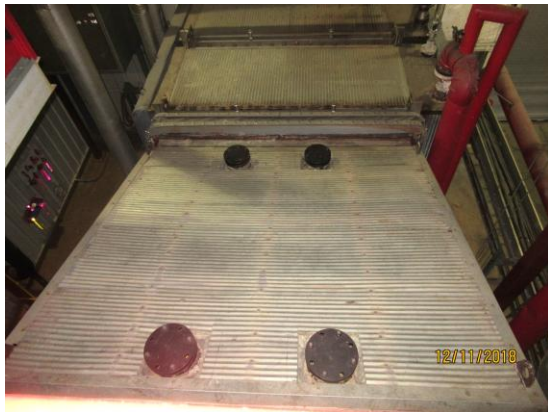


SENTRO Technologies USA, LLC performed On-Line dry chemical cleaning of HRSG internal tube bundles.

Cleaning benefits and results expected:

- ✓ Cleaning is conducted On-Line during normal operating conditions, ***no shut down.***
- ✓ Removal of fouling and scale from external tube surface, thereby increasing heat transfer, decreasing operating energy consumption.
- ✓ Scaffolds or a lifted platform to reach high openings might be required.
- ✓ No liquids, no water treatment.
- ✓ No dry-Ice, no risk of thermal shock.
- ✓ No foam, detergents, or soap.
- ✓ No cleanup or disposal requirements.
- ✓ No harmful chemicals, no negative environmental impact.
- ✓ No damage to tubes, refractory, or instrumentation.
- ✓ No confined space entry.

Client has cut 24 cleaning ports (openings) based on welded 4" flanges:



**Each side: 10
Top: 4
Total: 24 cleaning ports**

SENTRO's crew is based on 3 people: Team/Safety Leader and two Operators



**SENTRO JSA safety meeting
prior to job start**



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Air compressor providing minimum 500 CFM and 150 PSI, and a 2" air hose (provided by the client)



Loading batches of SENTROMAX™ dry chemicals into SENTRO's blasting machine.

SENTRO's dry chemical cleaning is performed by pneumatic spraying of SENTROMAX™ chemicals directly onto the tube bundle:



SENTRO Technologies USA, LLC

6725 Fairmont Pkwy, Suite 1120, Pasadena, TX 77505, USA

2372 Morse Ave, Suite #200, Irvine, CA 92614, USA

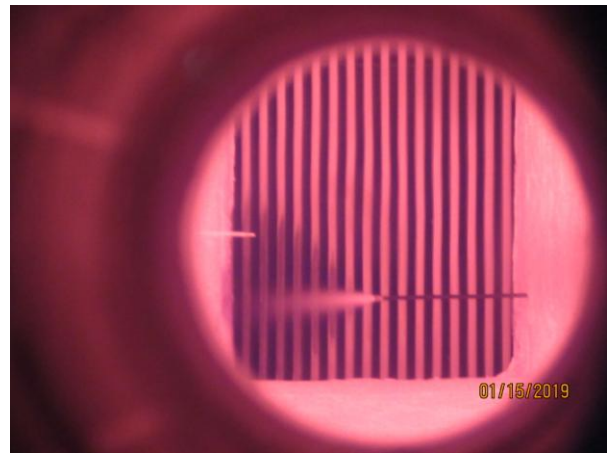
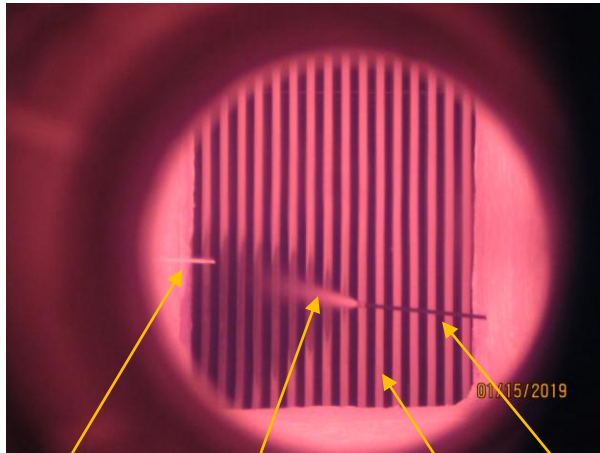
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The internal spray pattern could be viewed through a front sight glass:



Local
TI

SENTROMAX™
Spray

Tube
bundle

Spraying
Lance

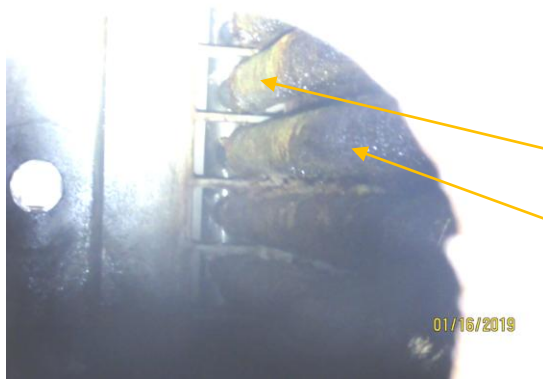
Cleaning results can be seen here:



Dirty tubes



Clean tubes



Dirty section
Vs.
Clean section of the tube

Note that SENTRO's non-aggressive dry chemical cleaning application WILL NOT damage tube wall, refractory, or instrumentation

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Expected ROI: between 3 to 6 weeks

Typical recommended locations for 4" flanged cleaning ports:



SENTRO Technologies USA, LLC complies with the highest level of HSSEalth, Safety, Security and Environment. and is proud to have experienced and professional team



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