

REINHOLD ENVIRONMENTAL®



2023 Reinhold/PCUG Round Table Presentation

Cohosted by Duke Energy and Vistra in The Westin Hotel,
Cincinnati, OH on June 26-27, 2023

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CORMETECH.

Success with Ice
Blasting Air Heater
Baskets

PREPARED FOR:
Reinhold Environmental
2023 Round Table

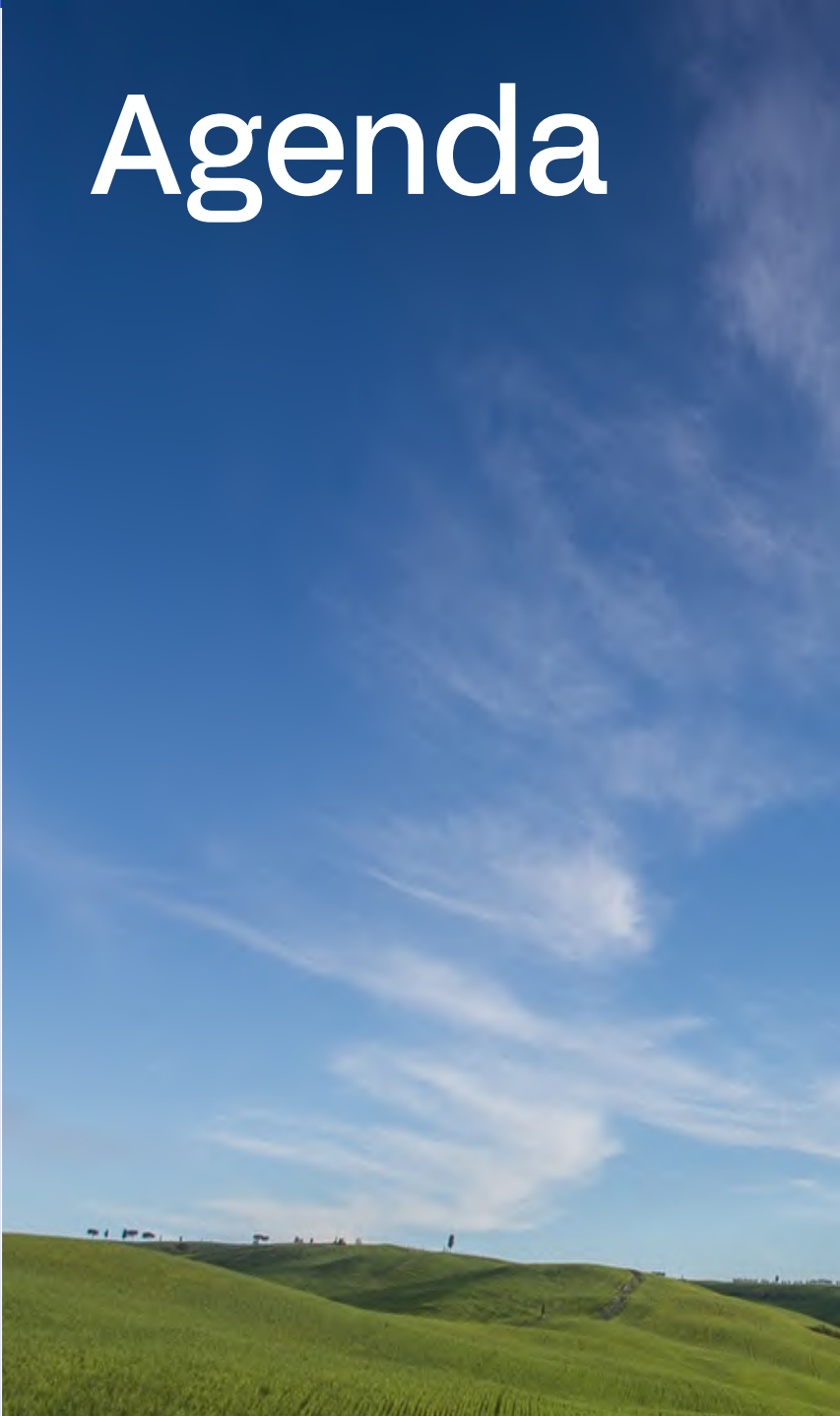


June 26, 2023



Agenda

- 01 Is it safe?
- 02 Ice Blast vs Water Wash
- 03 Success Story 1
- 04 Success Story 2
- 05 Success Story 3
- 06 Questions





Is Dry Ice Blasting Safe?



Dry Ice Blasting Safety

In addition to normal PPE for plant work:

- Tyvek suit
- Full face respirator with P100 cartridges
- Double ear protection
- Extra breaks when conditions demand

Air monitoring

- Per shift or hourly checks as required by confined space program
- Have monitored extensively for CO₂ – none has been detected



Dry Ice Blasting - General

CORMETECH patented process:

- Application patent
- Very similar to sand blasting or grit blasting
- Media is dry ice pellets that sublime upon impact

Onsite application:

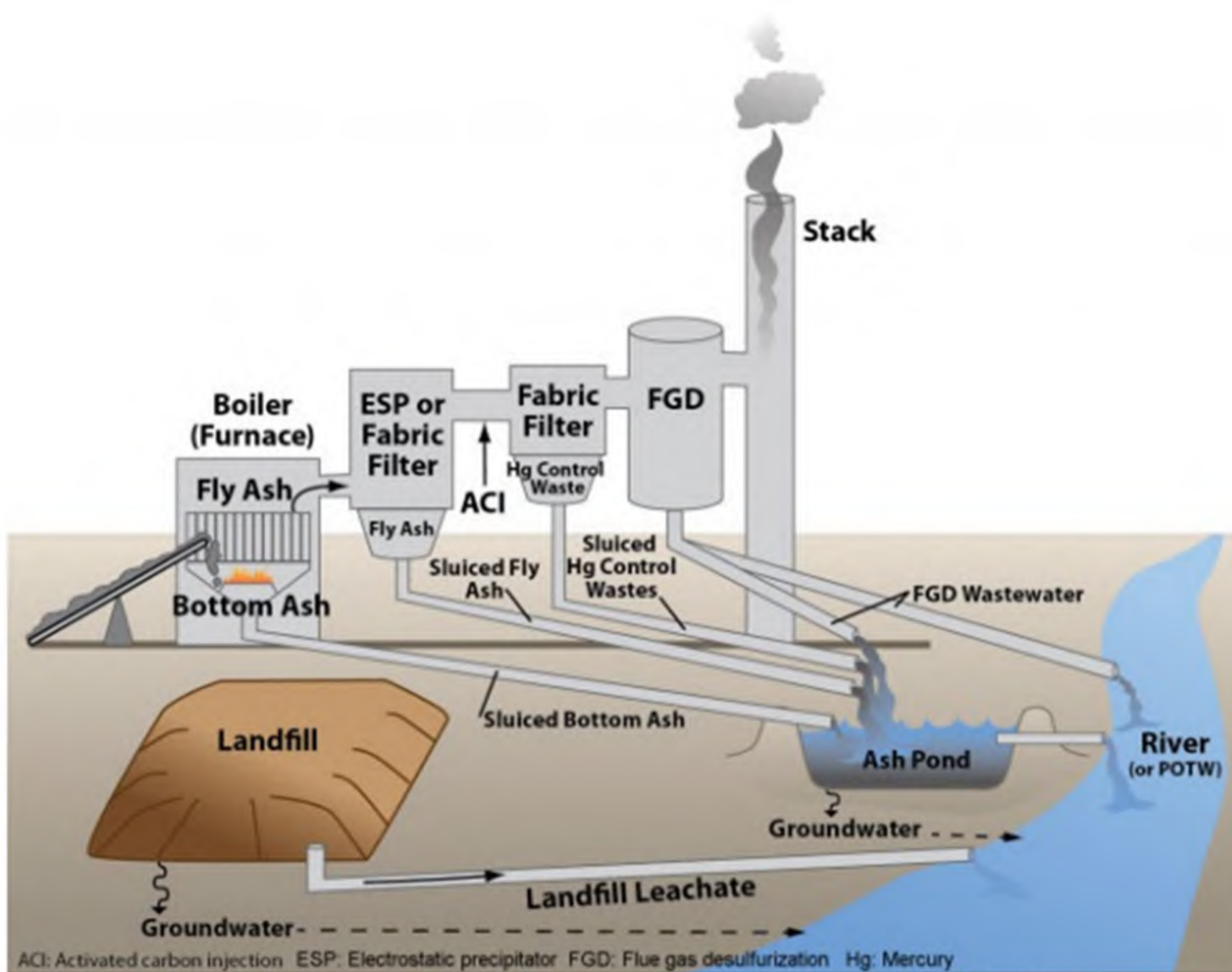
- We partner with J. Frazier Service Company
- CORMETECH provides oversight, pre-inspection, post-inspection, and report
- Used successfully on all catalyst types
- Now being applied for air heater basket cleaning



A background image of a bright blue sky with scattered white, fluffy clouds. The text is centered in the middle of the frame.

Why Dry Ice Blast Air Heater Baskets?





ACI: Activated carbon injection ESP: Electrostatic precipitator FGD: Flue gas desulfurization Hg: Mercury

Diagram 1. Key wastewaters produced by coal-fired steam electric power plants



Regulations, Regulations, Regulations

- CCR
 - Closure of ash ponds has led to no place to store / contain the large volumes of water used to wash air heaters
- ELG
 - Requiring treatment of effluent, including ash pond leachate
 - If an ash pond is still in place, the supplemental ELG will require treatment of leachate
- NPDES
 - Permit requirements have grown more stringent due to ELG
- No singular reason but rather a combination of the above
 - Varies from plant to plant



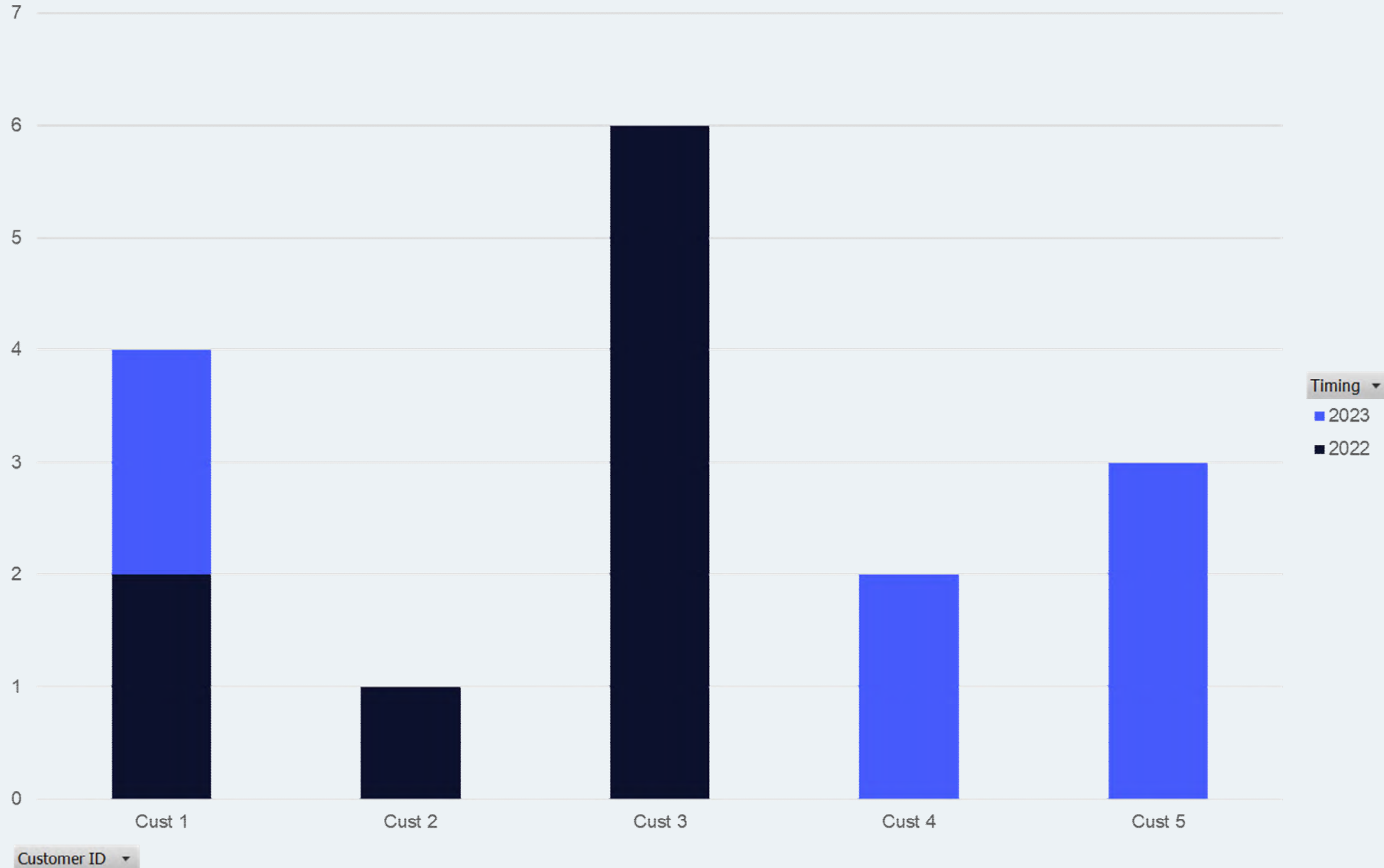
Dry Ice Blasting

- No water required
 - Traditional methods require 0.5M gallons per air heater
- No discharge, no residual to clean up
 - Vac truck and ash haul away required
 - No water treatment to perform
- Progress can be viewed in real time
- Similar cost
- Similar time commitment



Sum of AHS Blasted

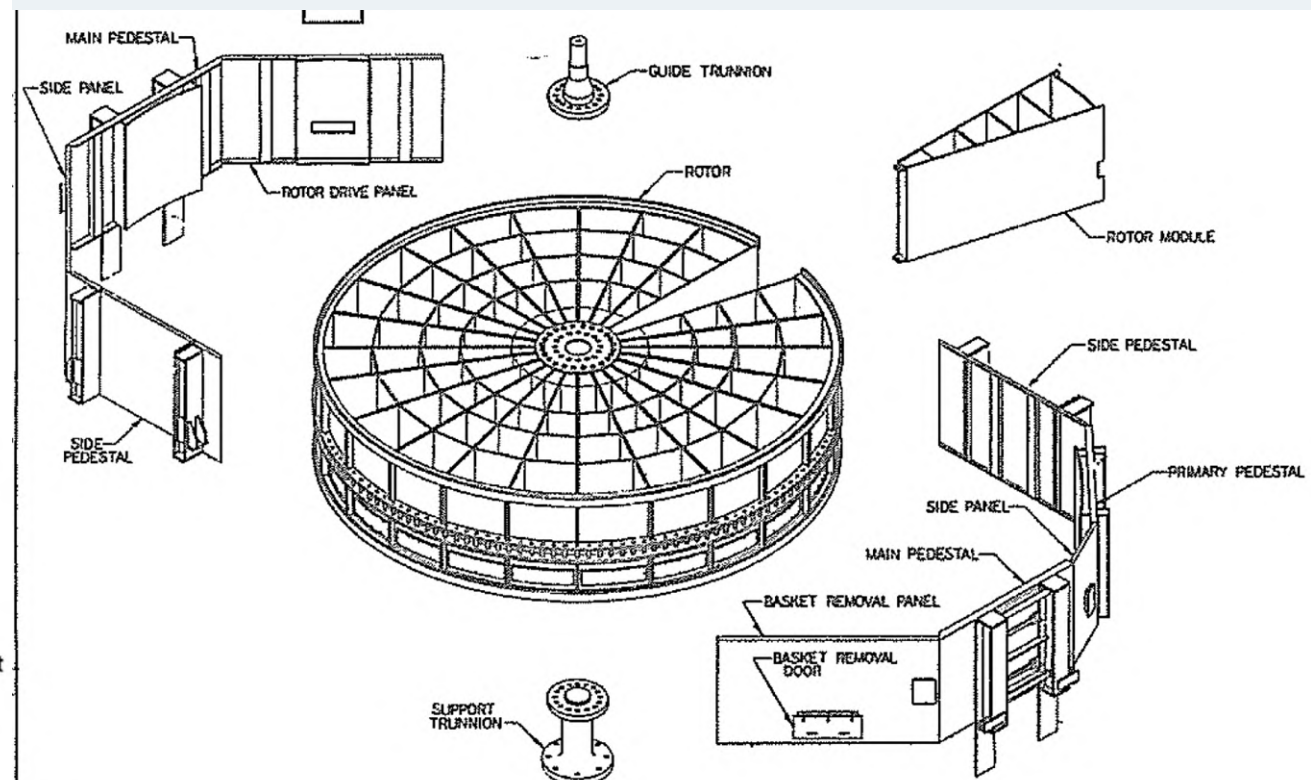
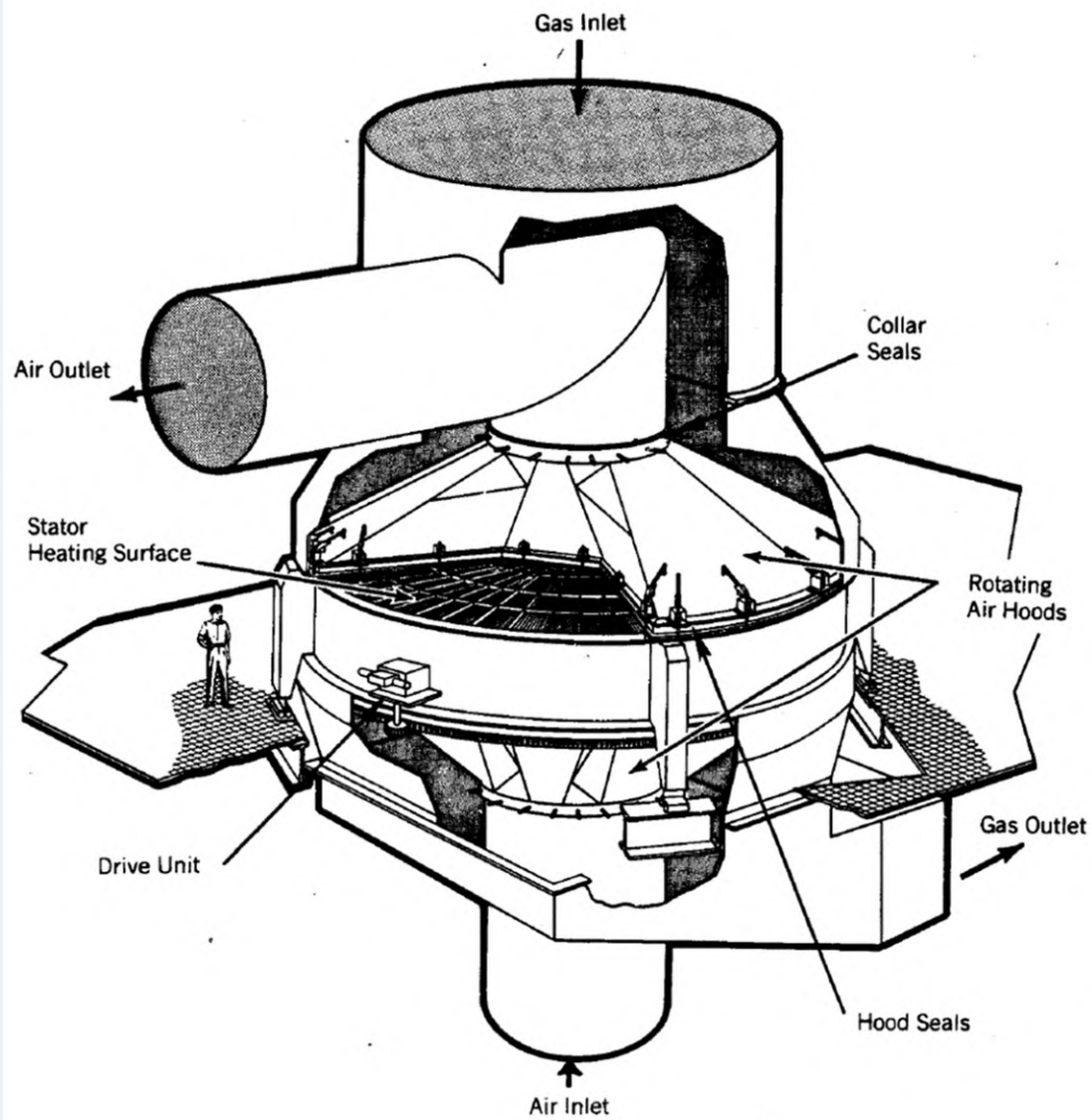
Projects To Date





Project Details

- Ljunstrom Air Heaters
- Vertical Flow
- Total basket depths ranging from 54 inches to 70 inches
- Total depth was two baskets on each project







Success Story 1

**725 MW Plant
PRB Coal
Located in Iowa**

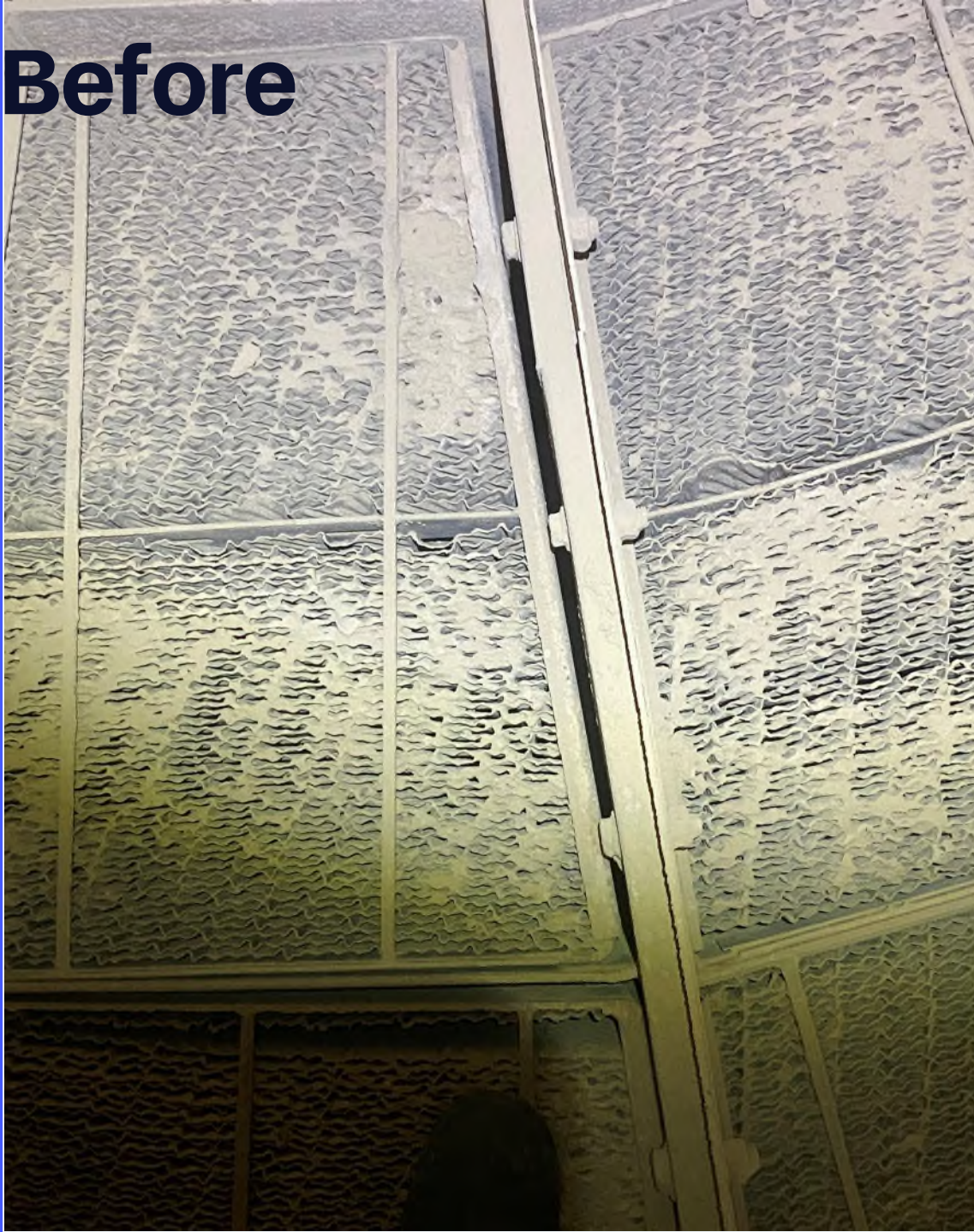


Customer Details

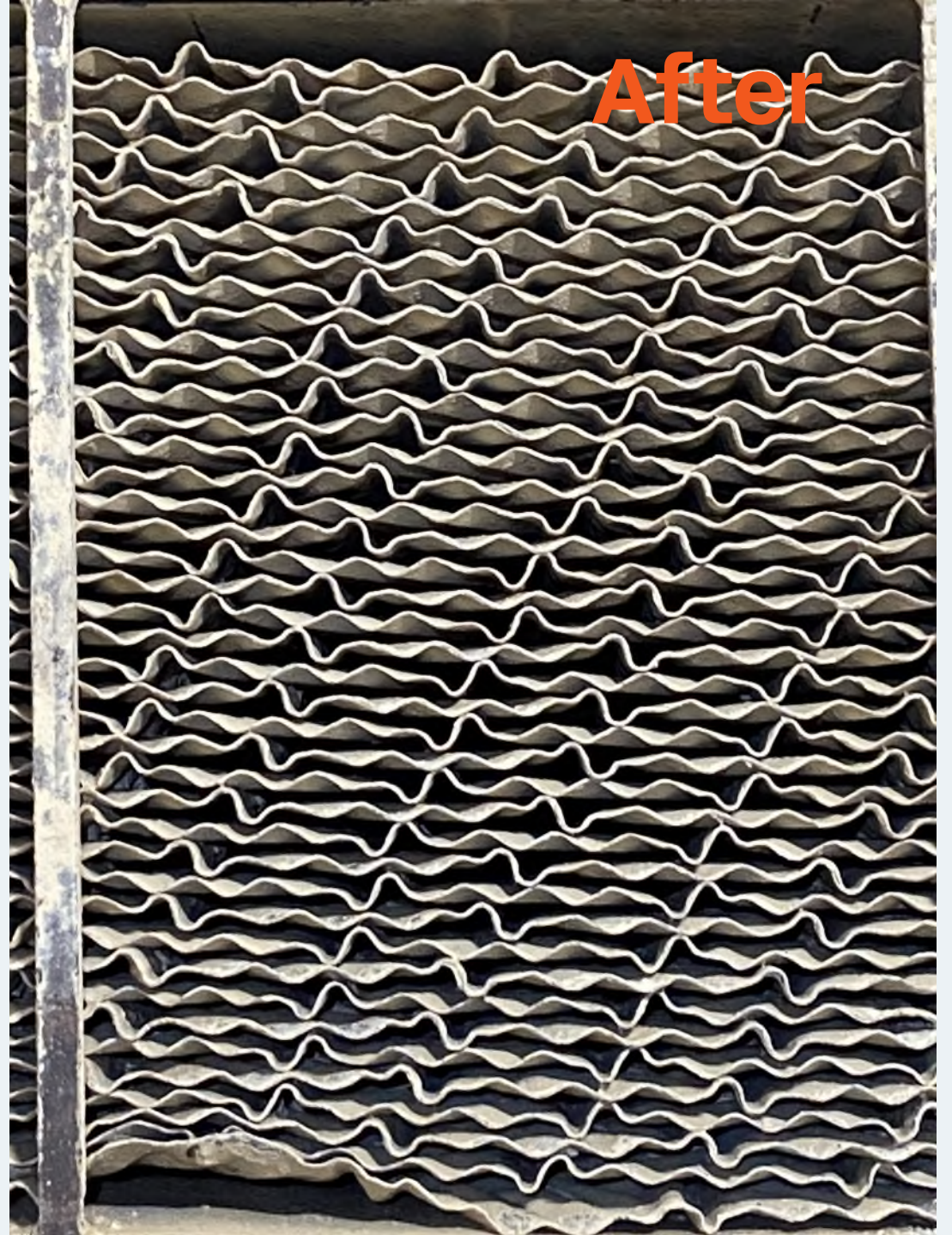
- First repeat customer for AH basket ice blasting
- Spring 2022 and Spring 2023
 - Ice blasted all catalyst in SCR
 - Ice blasted all air heater baskets
- 2 air heaters on this unit



Before



After

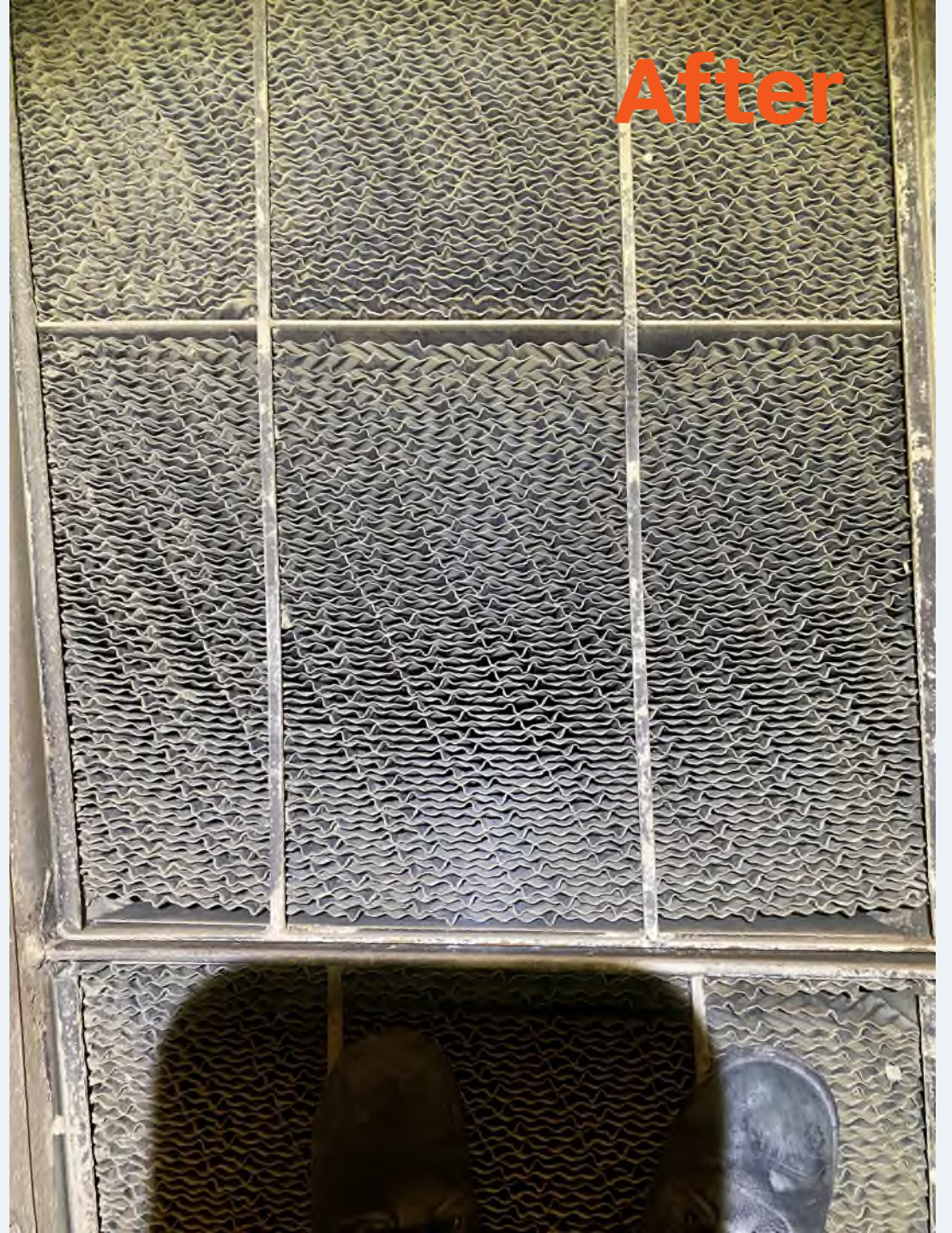




Before



After





Success Story 2

1300 MW Plant

Located in South Central Ohio

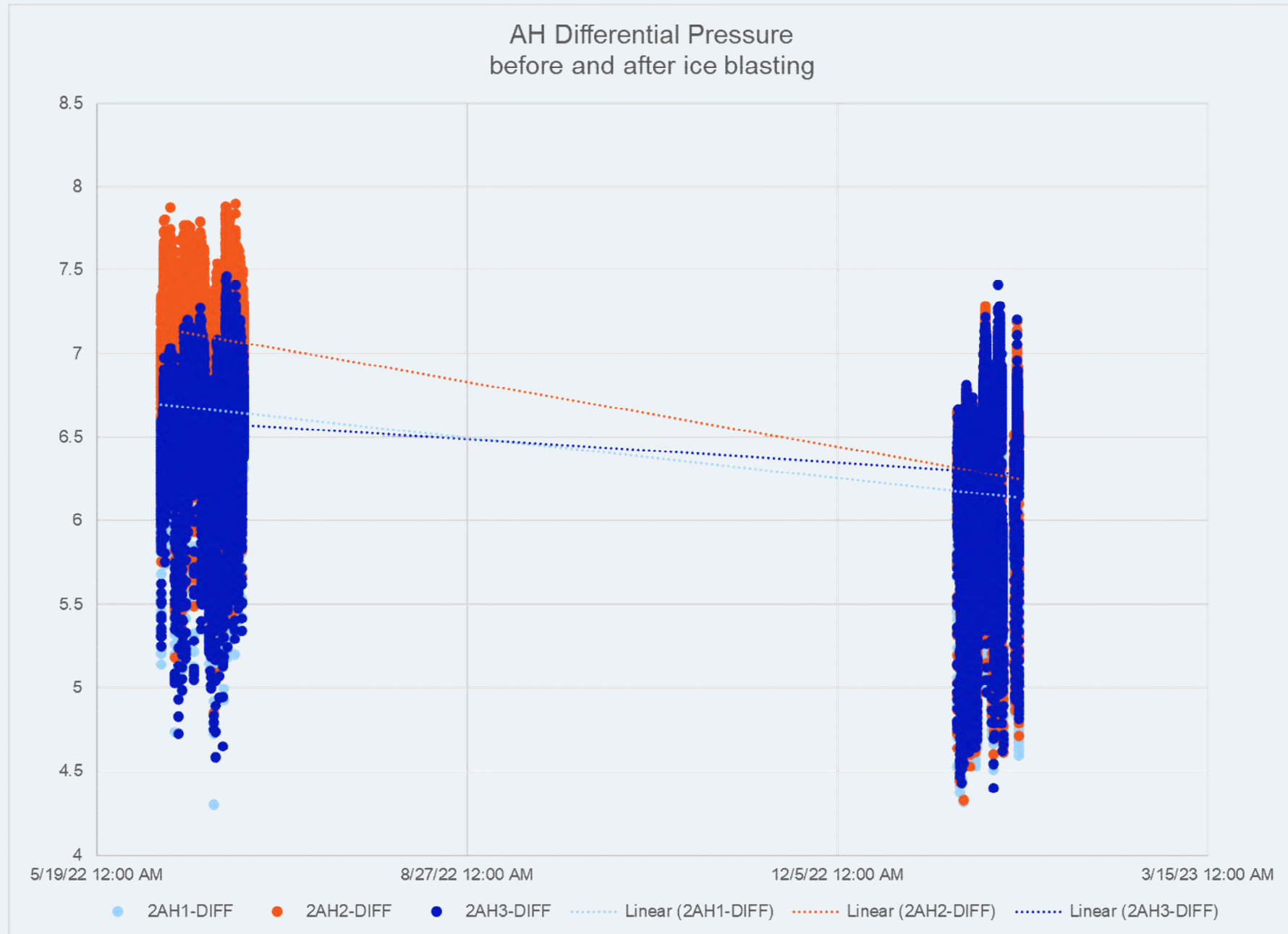


Customer Details

- Trial run performed with this customer
 - Already on-site for catalyst dry ice blasting
- 3 air heaters on this unit
- Trial consisted of ice blasting on AH3 and water wash on AH1 and AH2 for comparison



Before and After - Data





Before and After - Data

	AH1 dP	AH2 dP	AH3 dP
Average Before	6.56	6.96	6.49
Average After	6.24	6.38	6.38
Mode Before	6.98	7.03	6.06
Mode After	6.80	6.31	5.74
% Improvement	3.7%	9.4%	3.5%



View from below





Success Story 3

1300 MW Plant

Located in Western West Virginia

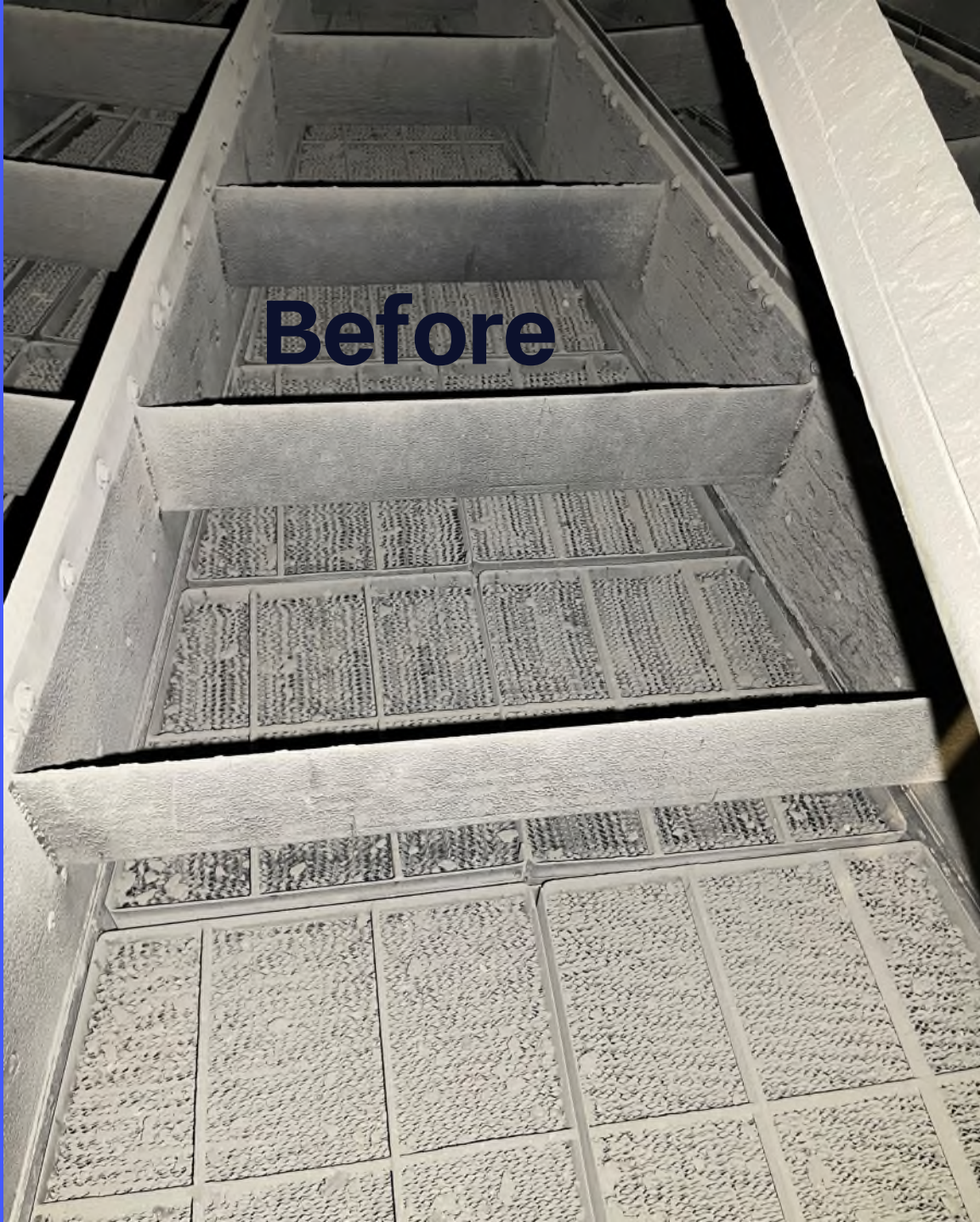


Customer Details

- First Air Heater only project
- 3 air heaters on this unit
- Heavy plugging in all 3 air heaters

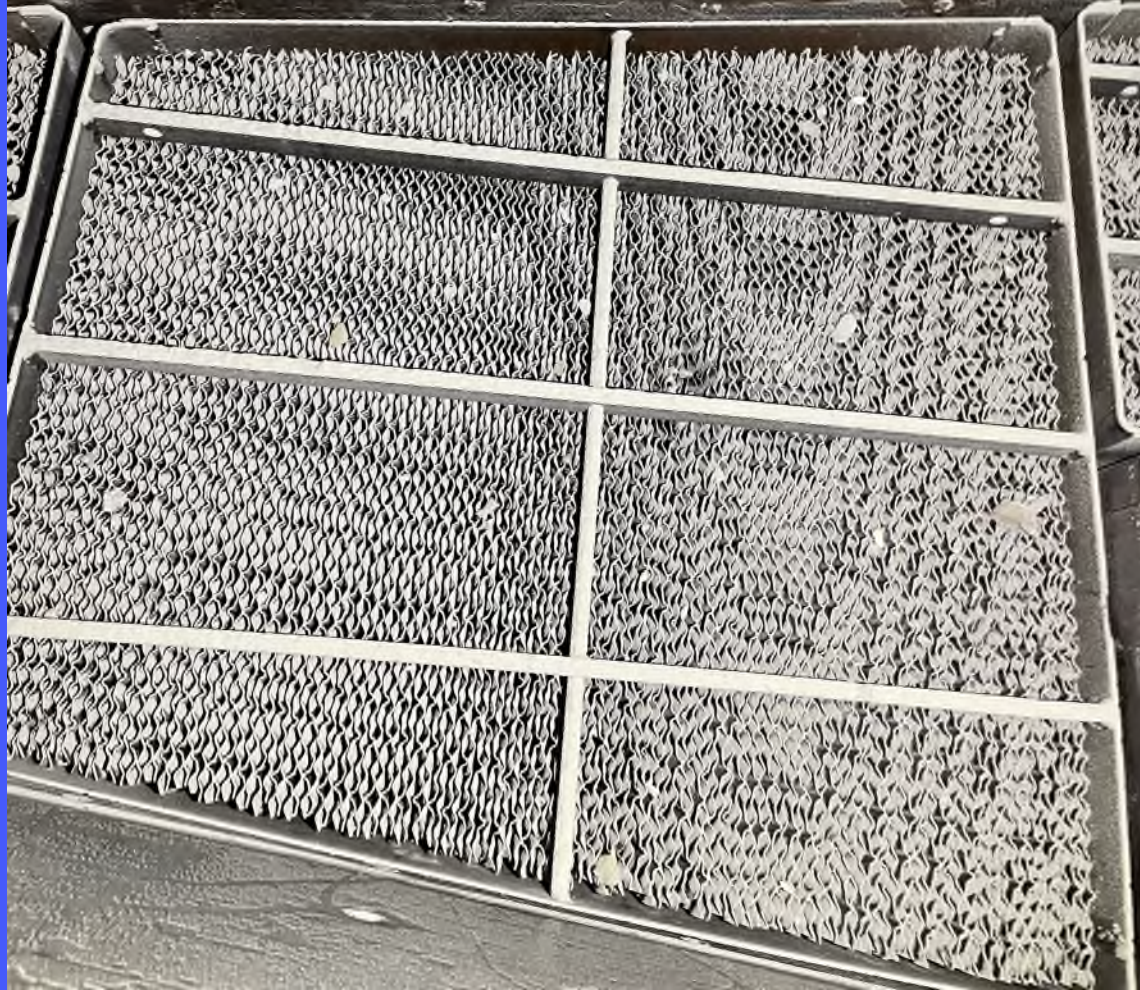
Before

After

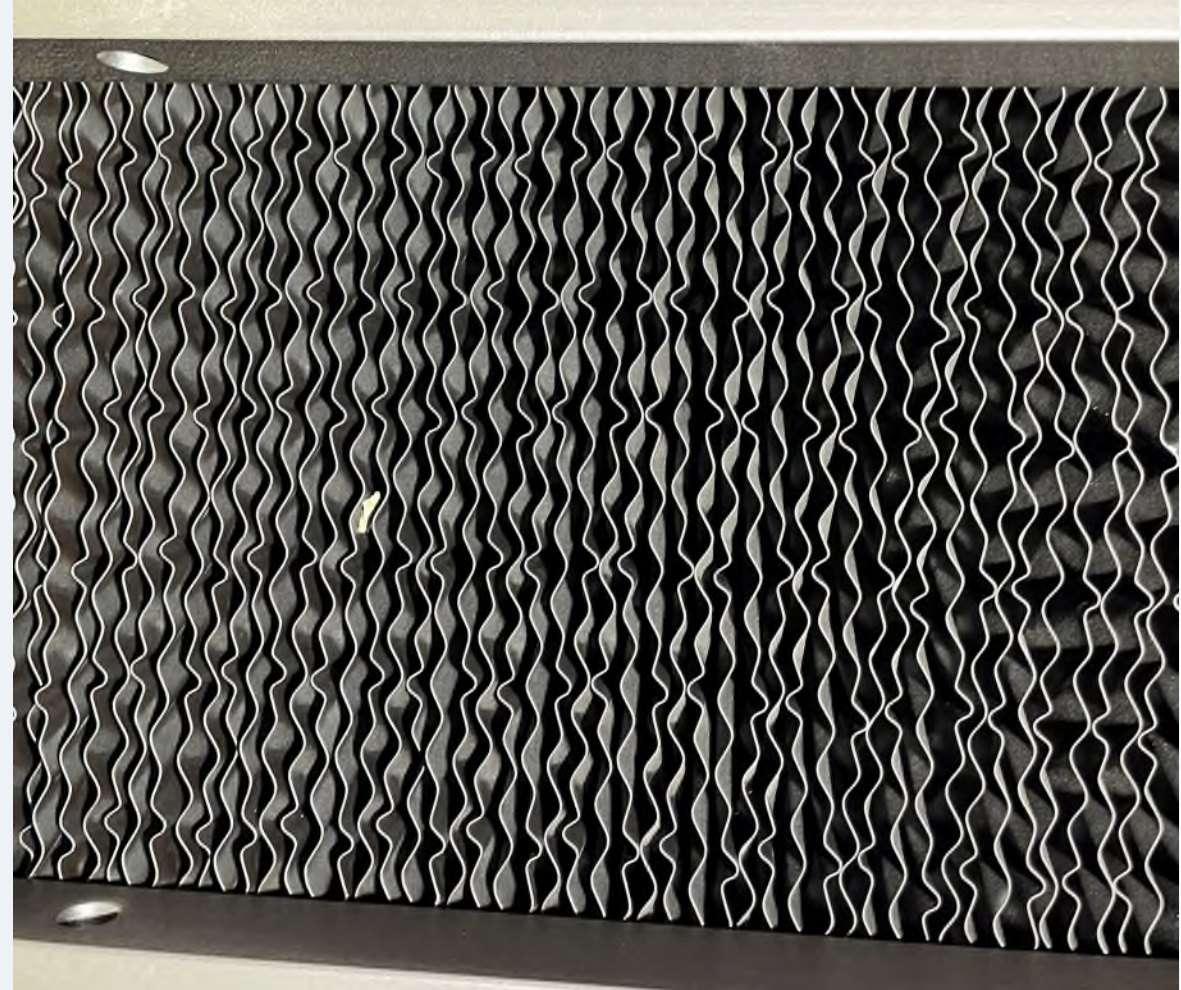




Before



After





Questions / Discussion



Thank you!

CORMETECH.

Contacts

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Notes

- April 13, 2023 article in Energy News
 - Old 1982 standards allowed WW to be deposited into coal ash ponds
 - Supplemental ELG, released 3/7/2023 aims to put an end to this practice
 - New rule proposes standard of zero pollutants discharged from water used in scrubbers and boilers, and requires BAT for treatment
 - New rule requires collection and treatment of ash pond leachate
 - Exemptions allowed if 1) stop burning coal by 2028 or 2) have installed less-effective WW treatment, can delay adherence to 2032
- March 8, 2023 article from EPA
 - Aimed at FGD ww, bottom ash transport water, and combustion residual leachate
 - ELG – national industry-specific WW regs based on the performance of demonstrated WW treatment technologies. Intended to represent the greatest pollutant reductions that are economically achievable for an entire industry
 - 2015 – finalized ELG for Steam Electric Power Generating category
 - 2020 – reconsideration rule revising 2015 requirements for FGD and BA transport water
 - Biden EO required review of reconsideration rule
 - 2021 – EPA announced intent to develop the rule being published March 2023
 - NPDES – National Pollutant Discharge Elimination System
 - CCR – coal combustion residuals



Notes

- CCR – coal combustion residuals
 - 2015 rule requires closure of CCR units (ash ponds) if:
 - Unit does not meet structural requirement
 - Unit does not meet location requirements
 - Ground water monitoring indicates contamination above ground water protection standards
 - Unit is not being used any longer
 - 2020 revision
 - Requires closure or retrofit of unlined units regardless of ground water monitoring results
 - Defines “clay-lined” units as unlined