

CIBO Policy & Technical Issues Conference I May 14, 2025

Ed Harris

Valmet





Valmet in brief
 Past - Michigan State Univ.
 Present - Roquette America, Inc.
 Potential Installations and FEED Studies
 Summary





Valmet is a technology provider with global presence 33 countries, over 110 service centers, 152 sales offices, 76 production units, 34 R&D centers



Valmet in brief
 Past - Michiga

- Past Michigan State Univ.
- Present Roquette America, Inc.
 - Future Proposed International Installation

Summary

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 Steam:
 350,000 lb/hr
 (44 kg/s)

 900 psig
 (62 bar)

 835 °F
 (446 °C)

 Fuel:
 Bituminous coal, Gas

 Startup:
 1993, 2015





Past – Michigan State University

Design features

- Originally designed for gas
- Gas lances/SUBs capacity: 60%/40% MCR
- PA cooling air
- High pressure purge air from sootblower air compressor system

Scope of work

- Upgrade start-up burners (SUB)
 NFPA Bed Temp. 1100°F vs 900°F
- Reconfigure SUB air from cold sec. air to hot sec. air
- Refurbish gas lances and natural gas supply





CFB Natural Gas Conversions Past – Michigan State University











Reference 2018 CIBO presentation

Past – Michigan State University



150 kpph

Rate (Ib

0.01

0.005

0

2:24

adade Barth and a way

A:2A

16:48

N9.72

12:00

Time

0.50

N STATE UNIVERSITY Infrastructure Planning and Facilitie

CEMS NOx lb/mmBTU

PEMS CO lb/mmBTU

Results: Avoided CO₂



CFB Natural Gas Conversions Past – Michigan State University

MICHIGAN STATE UNIVERSITY Infrastructure Planning and Facilities

Issue: Refractory performance

Silica sand used

infiltrates and causes erosion <u>behind</u> the refractory.



This results in local hot spots when operating at medium to high loads.





SHA'S Respirable Crystalline Silica









Present – Roquette America, Inc.

Design features

- Solid fuel capability required
- Gas lances/SUBs capacity: 100%/50% MCR
- PA cooling air
- High pressure purge air from loopseal blowers

Scope of work

- Upgrade start-up burners (SUB)
 NFPA Bed Temp. 1100°F vs 900°F
- Design/install complete in-bed lance system, incl BMS upgrades
- Upgrade gas supply to building
 - Customer scope, not yet completed





CFB Natural Gas Conversions Present – Roquette America, Inc.



Present – Roquette America, Inc.



Emissions @ 40% MCR

- NOx = 6.5 ppm (~ 0.014 lb/MMBtu)
- CO = 5.0 ppm (~ 0.006 lb/MMBtu)

Current operational Issues

- Load limited due to gas supply
- Backsifting
 - Due to low load?
 - Worn fluidizing nozzles?



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FEED Efforts and Performance Evaluation for Gas Additions

Design features

- Solid fuel capability required
- Gas lances/SUBs capacity: 100%/40% MCR
- PA cooling air
- High pressure purge air from loopseal blowers
- FGR available for temperature control

Scope of work

- Upgrade start-up burners and lances
 - 1400°F vs 1100°F
- Design/install complete in-bed lance system, incl BMS upgrades, SUB Replacement, and all fuel delivery systems





Summary

- Solid fuel capability maintained
- Low installation cost (relative to other gas conversion options)
- Very Low Emissions
- Reduced CO₂ compared to coal
- Lower maintenance and operation costs
 - no Fuel or Bottom Ash systems in operation





OSHA's Respirable Crystalline Silica Standard for Construction







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