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Boundary Dam Unit 3 Carbon Capture Update

IEAGHG 4th Post Combustion Capture Conference

September 5-8, 2017 – Birmingham Alabama

Presented by Brent Jacobs

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Organization	A Not for Profit Corporation with an Independent Board of Directors
Sponsors	BHP Billiton – Funding Sponsor ($20 million over 5 years) SaskPower – Knowledge Sponsor
Vision	Projects undertaken at the Knowledge Centre will help inform stakeholders regarding “real world” considerations in the use of CCUS and advance the practical knowledge of CCUS as a viable solution. • Promote open exchange of information • No technology ownership • No membership costs

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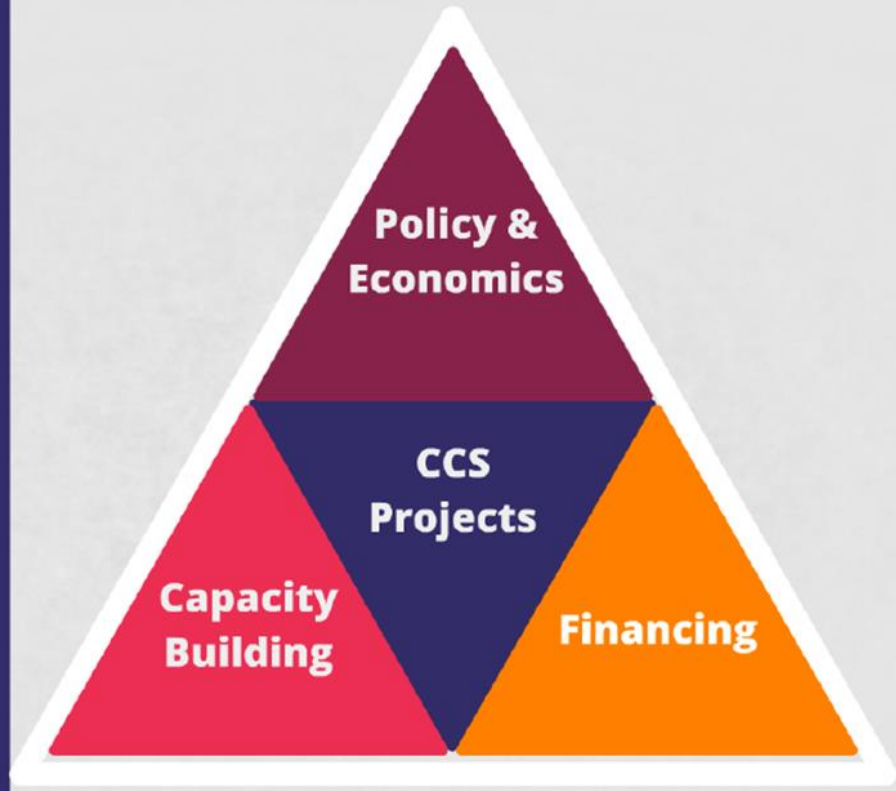
THE INTERNATIONAL CCS KNOWLEDGE CENTRE

Facilitates in an advisory role

Based on expertise and lessons learned



MANDATE:

Advance the understanding and use of CCS as a means of managing GHG emissions

MISSION:

To accelerate deployment of CCS worldwide

BOUNDARY DAM

LEARNING STARTS HERE:
NEXT PLANT WILL BE UP TO 30% CHEAPER

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BD3 ICCS Project Background

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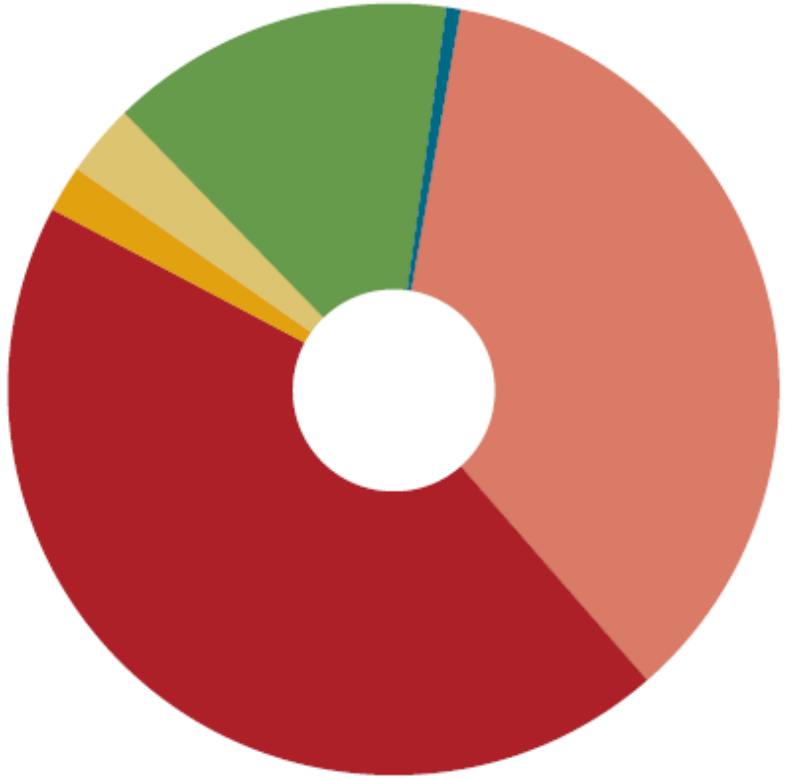

2016-17 GROSS ELECTRICITY SUPPLIED - 24,374 GWH

- GAS 36%
- COAL 44%
- IMPORTS 2%
- WIND 3%
- HYDRO 14%
- OTHER 1%

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Regulations in Canada

CLEANER

1100 t/GWh = Lignite Coal Plant

550 = Current Natural Gas Plant

420 = Canadian Regulations on Coal Plant

400 = New Natural Gas Plant

120-140 = CCS on Boundary Dam 3

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BOUNDARY DAM UNIT 3 DESIGN PERFORMANCE

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Project Timeline

- 2007 – Project development started
- 2010 – Decision to proceed
- Spring 2011 – Construction begins
- Summer 2014 – Construction complete
- 2013-14 – Commissioning
- Oct. 2, 2014 – Grand launch
- July 2015 – New CO2 emission regulations came into force
- Sept 2015 – First planned maintenance outage
- June 2017 – Second planned maintenance outage

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Performance

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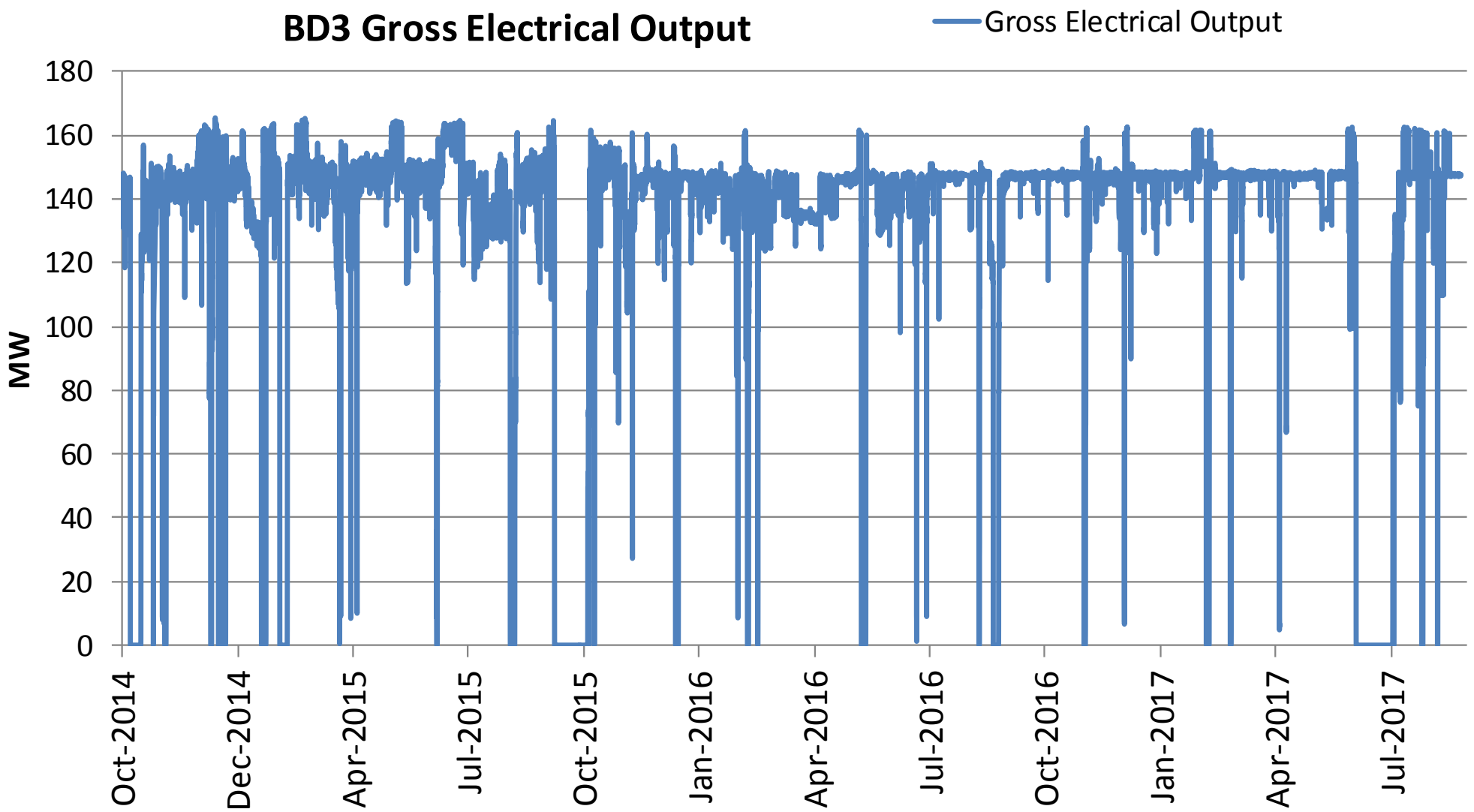

Reliable Performance of Power Island Since Refurbishment

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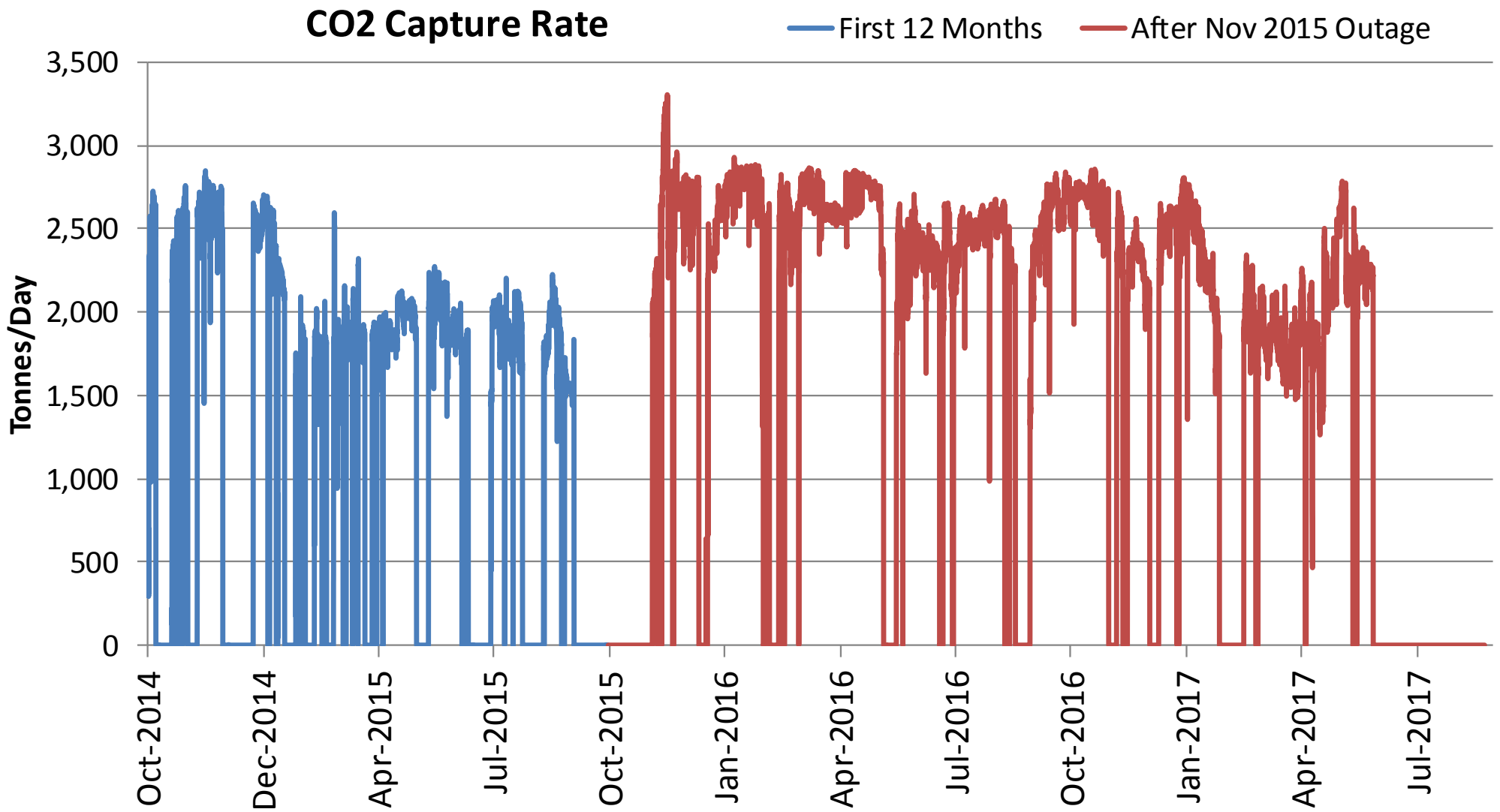

CO2 Capture Performance

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Outage Summary

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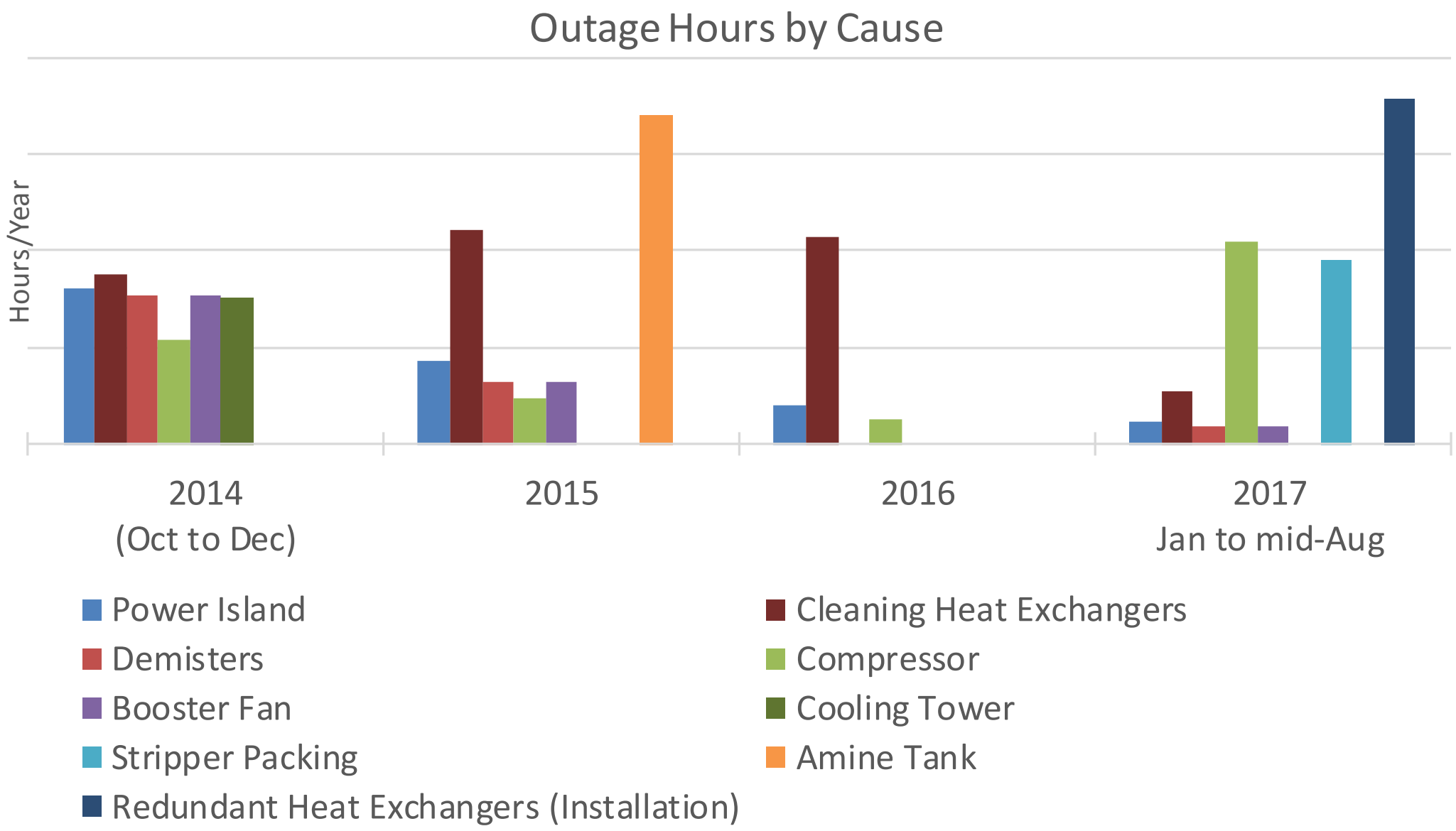

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Examples of Operational Challenges

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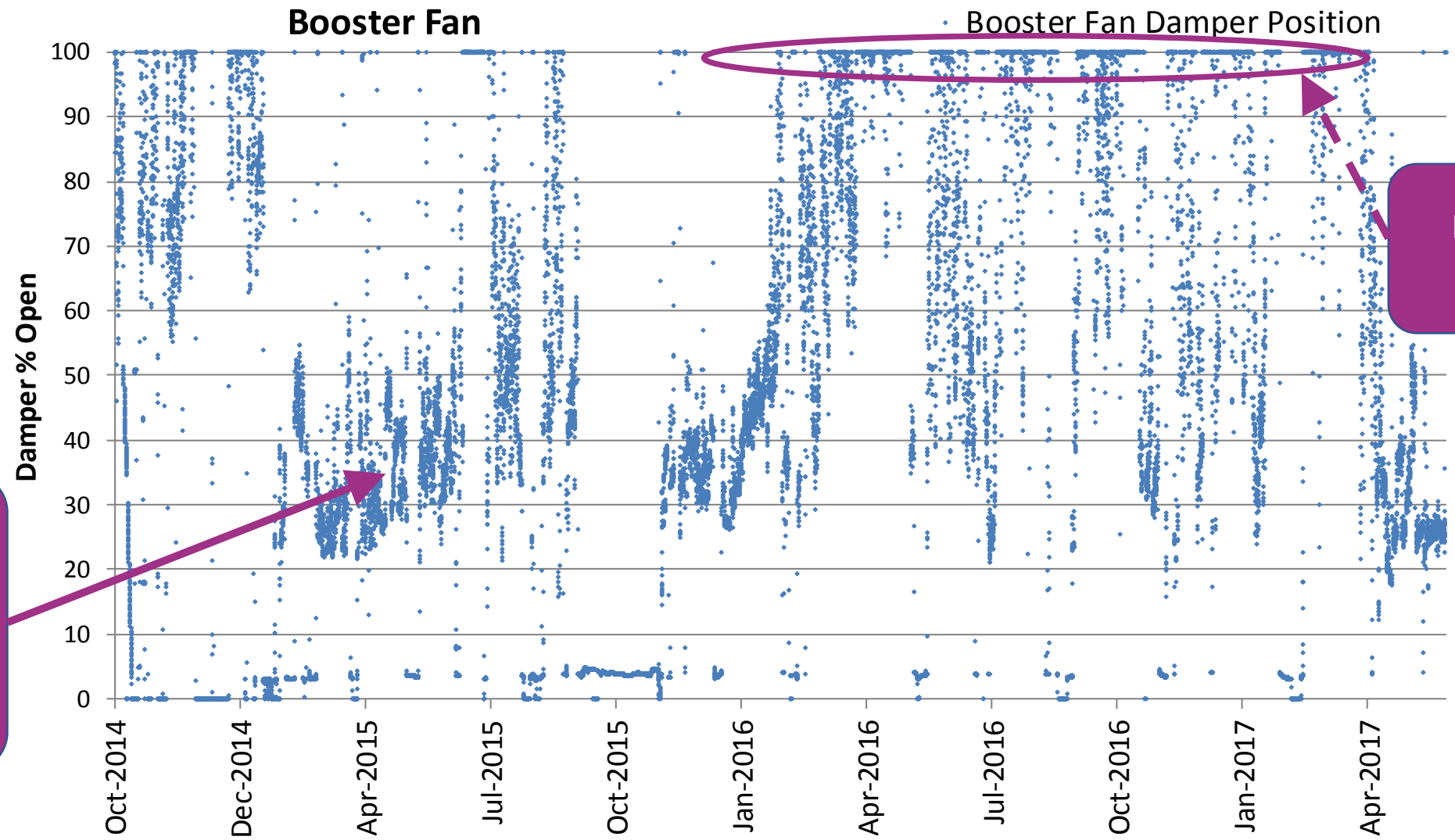

Booster Fan Frequently at Maximum Capacity

Flue Gas Differential Pressure Increases Between Outages

Insufficient Fan Capacity Due to Higher Differential Pressures

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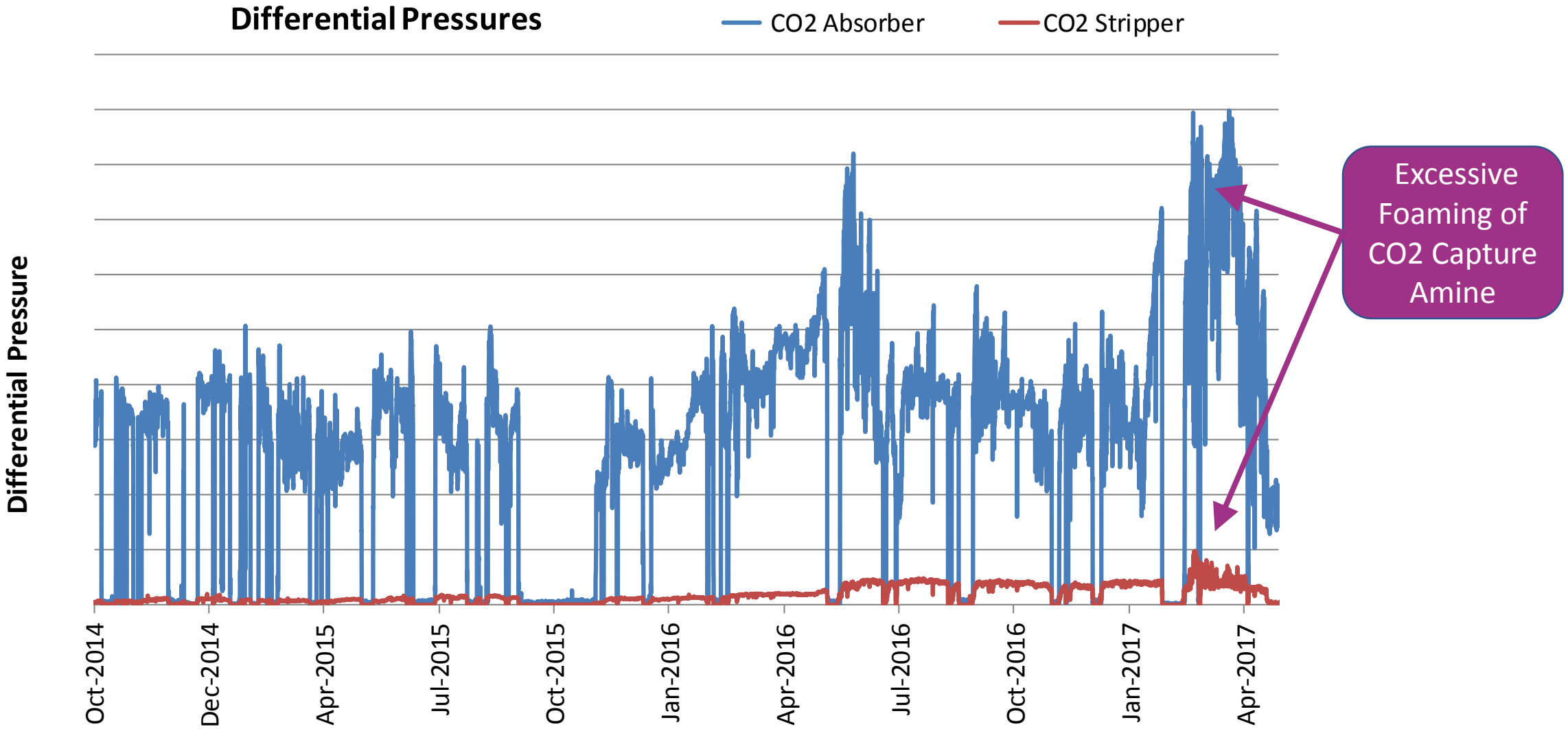

Foaming Contributing to High Differential Pressures

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Novel Solutions

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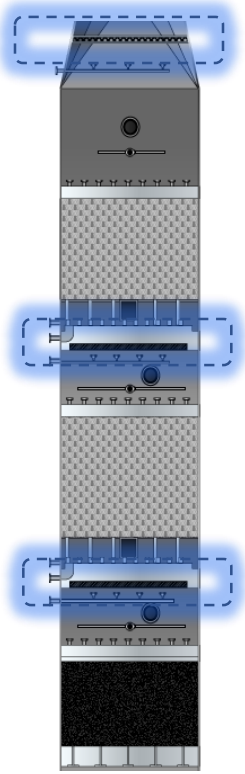

SO_2 Absorber

Online Demister Wash Systems

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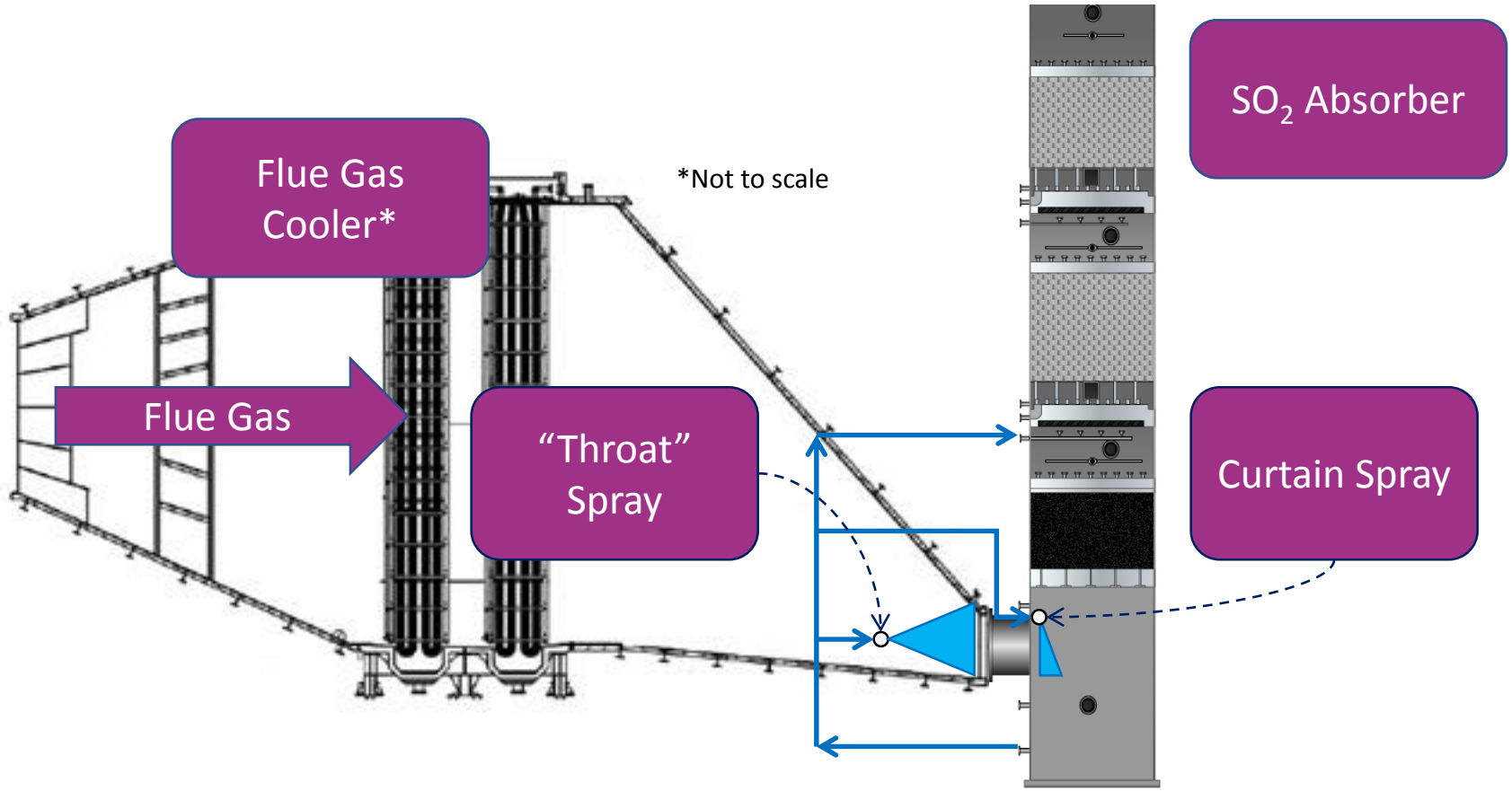

Spray Systems for Particulate Control

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Throat Spray in Operation

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Activated Carbon Filtration and Reduction in Foaming

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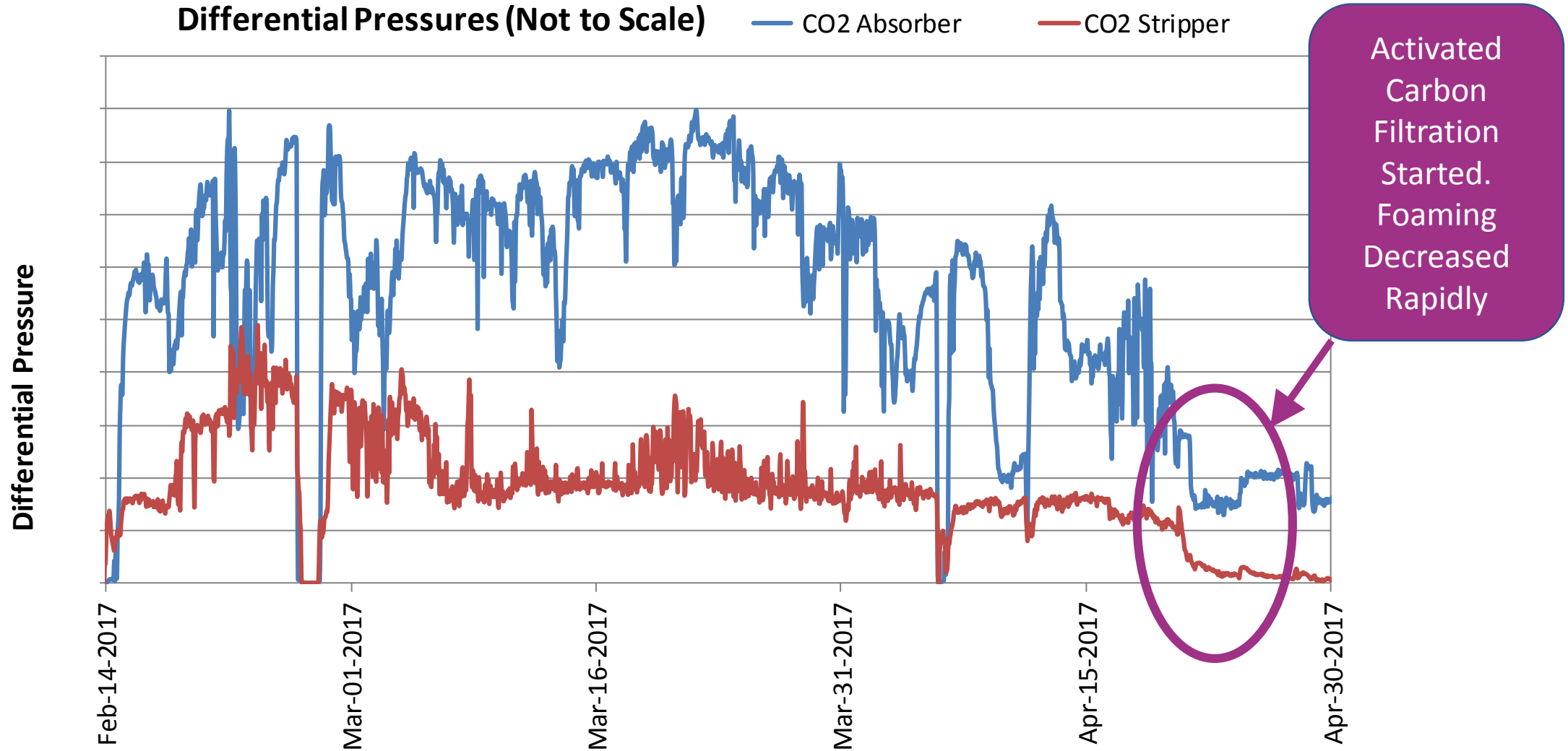

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Other Improvements Made Since 2014 Commissioning

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What's Next?

- Performance testing
- Continue to improve operational efficiencies and reliability
- Further studies and transfer of learnings from BD3 to future CCS projects

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Questions?

Thank You

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For more information please visit our website at:

CCSKnowledge.com

or contact us by email: **info@ccsknowledge.com**