Reinhold Environmental Ltd.

2006 APC Round Table & Expo Presentation

July 16-18, 2006, Columbus, OH

New Technology Overview

July 18, 2006

Environmental Services – New Product Status

Mercury CEMs

- Design currently undergoing reliability testing.
- RATA testing completed.
- Distance between stack and analyzer increased to 400 ft.

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US EPA RATA Testing (Feb 2006)

RATA Calculations for GE

Concentrations corrected to 20°C, dry basis

Run #	Date	Times	GE µg/dsm³	OH µg/dsm³	Difference µg/dsm³	Status
1	2/20/2006	1055-1255	3.08	#N/A	#N/A	Invalidated
2	2/20/2006	1415-1615	2.71	2.23	0.48	Included
3	2/21/2006	0950-1150	2	1.6	0.4	Included
4	2/21/2006	1250-1450	2.23	2.14	0.09	Included
5	2/21/2006	1540-1740	2.79	2.23	0.56	Included
6	2/22/2006	0920-1120	3.47	3.93	-0.45	Invalidated
7	2/22/2006	1230-1430	3.58	2.68	0.9	Included
8	2/22/2006	1540-1740	3.3	2.32	0.98	Excluded
9	2/23/2006	0930-1130	8.07	7.58	0.49	Included
10	2/23/2006	1210-1410	7.47	6.25	1.22	Included
11	2/23/2006	1500-1700	6.75	5.83	0.91	Included
12	2/24/2006	0910-1110	5.53	4.35	1.18	Included
Arithmetic Mean of all runs (µg/dsm³)			**4.25**			

$\overline{RM}$ <5 µgms/m3

Total valid runs	**10**			
Mean of included runs only (µg/dsm3)	**4.44**	**3.72**	**0.72**	
	Standard Deviation		**0.37**	**µg/dsm³**
	Confidence Coeffici		**0.26**	**µg/dsm³**
	Relative Accuracy		**26.47%**	

Runs incl in RA calc	**9**			
Mean of included runs only (µg/dsm3)	**4.57**	**3.88**	**0.69**	
	Standard Deviation		**0.38**	**µg/dsm³**
	Confidence Coeffici		**0.29**	**µg/dsm³**
	Relative Accuracy		**25.39%**	

Difference between $\overline{RM}$ & CEMS <1.0 µgms/m3.
Passes RATA using the alternative method.
Part 75 App A, Sect 3.3.8

Passed RATA

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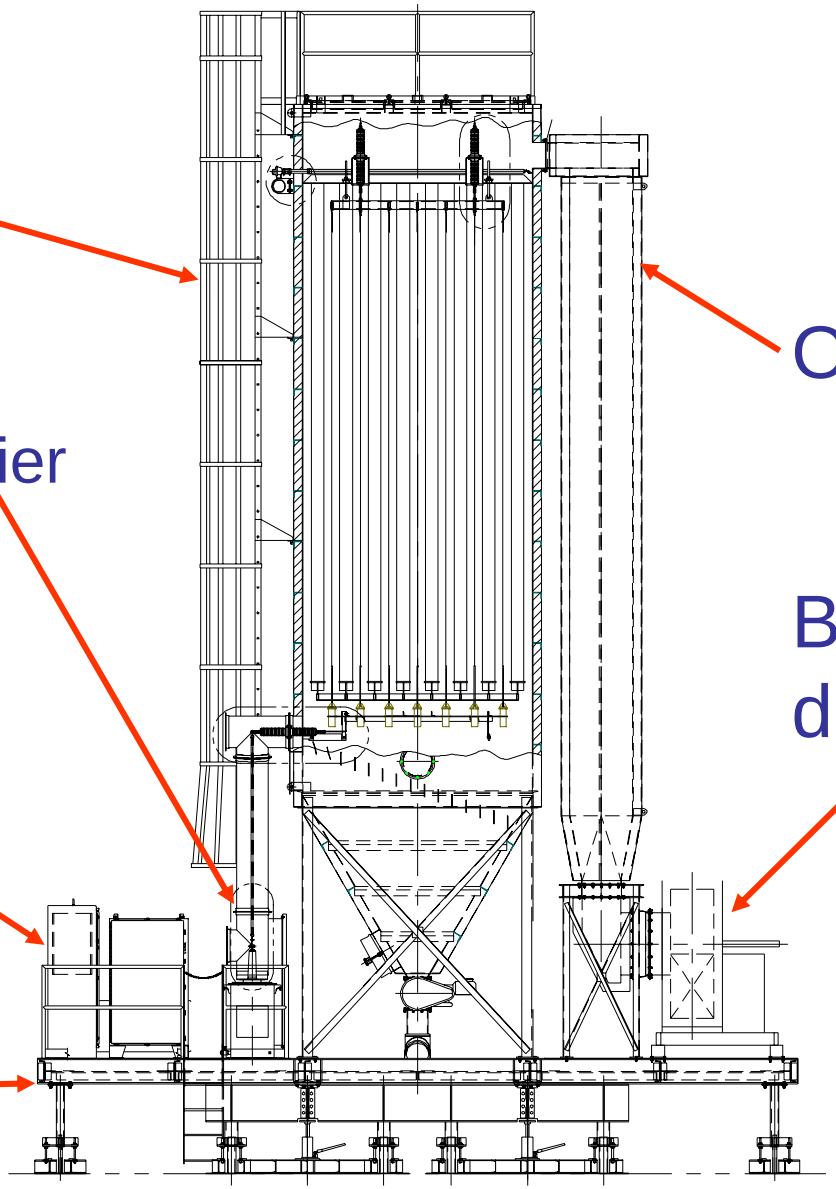
Environmental Services – New Product Status

Max-9

- First commercial installation sold to Stora Enso:
  - 300,000 ACFM pulverized coal and stoker fired boilers.
  - Start up anticipated September 2007.
- Transportable Max-9 in service:
  - 20,000 ACFM self contained unit
  - Used to confirm Max-9 and sorbent capabilities.
- MeRC 20,000 ACFM permanent installation.

Max-9 Transportable



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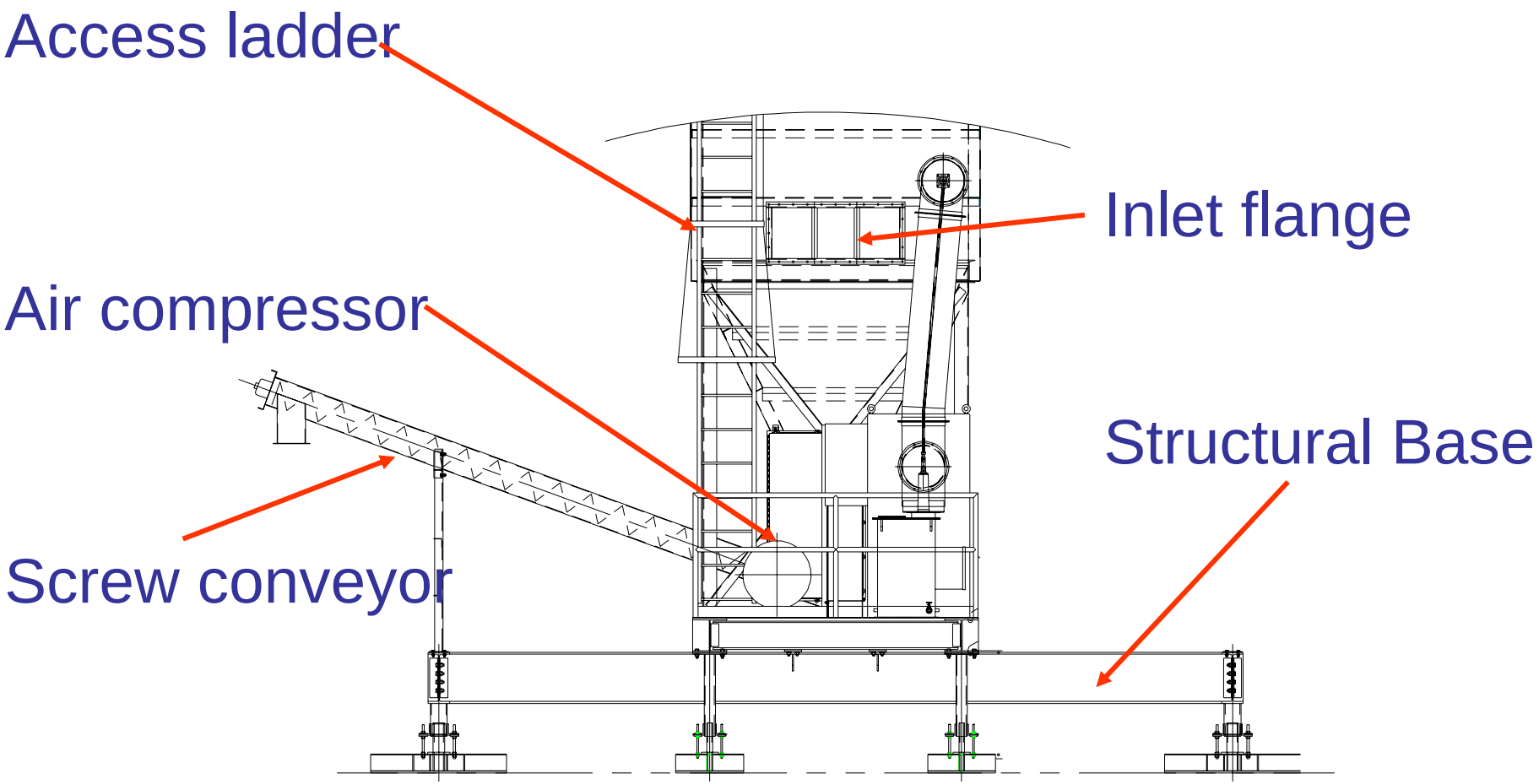
Max-9 Transportable



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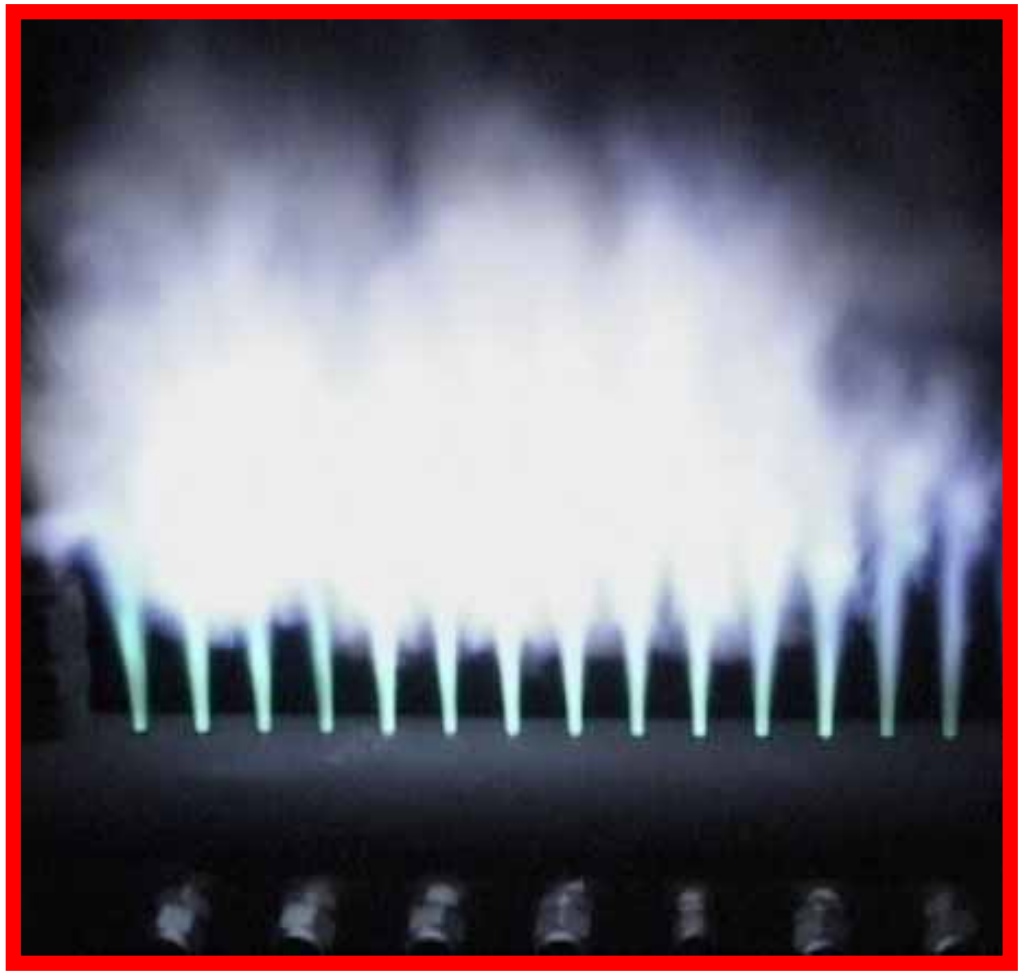
Environmental Services –Product Development

Pulse Detonation

- Improved cleaning of radiant and convective heat transfer surfaces.
- Based on aviation propulsion technology.
- Fuel is combusted in a detonation chamber creating a rapid sequence of acoustic pulses.
- Technology has been demonstrated at two utilities with excellent results.
- Intended to improve ability to accommodate high slagging fuels and affect of furnace sorbent injection.

Environmental Services –Product Development



PD technology provides enhance cleaning of heat transfer surfaces without eroding tubes.

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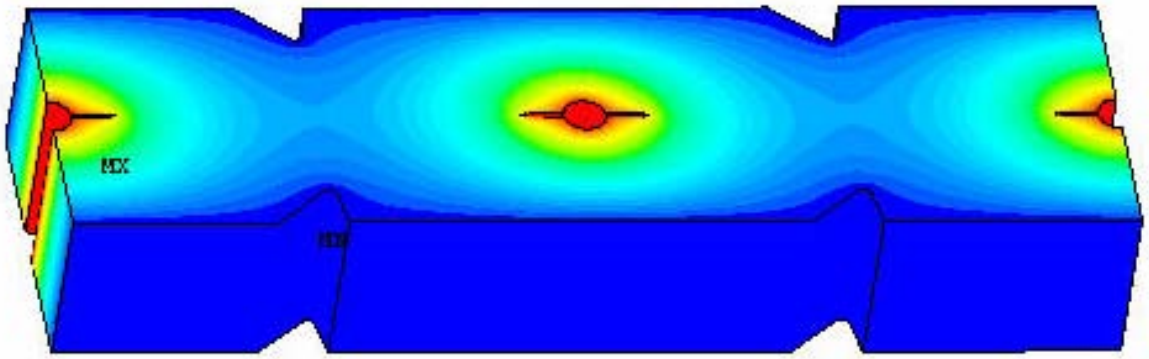
Environmental Services –Product Development

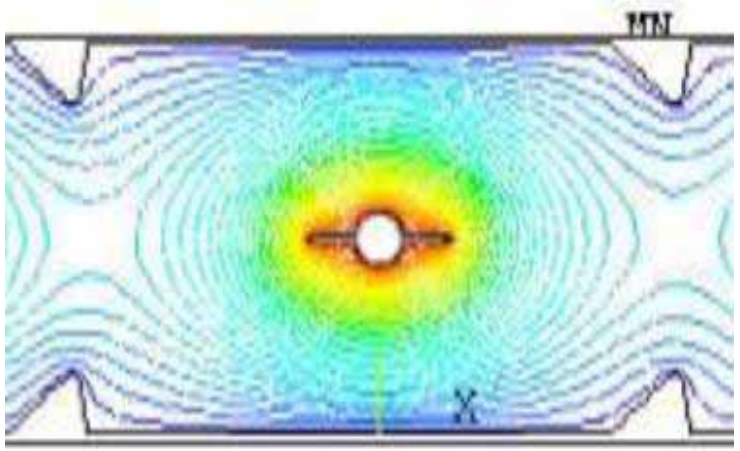
Enhanced Discharge Electrodes

- Currently developing enhanced discharge electrodes.
- Intent is to improve ESP performance without increasing collecting plate area.
- Laboratory testing demonstrated ability to increase average field strength significantly.
- Field demonstrations begin in July 2006.
- Technology can be retrofit into existing ESP's to accommodate sorbent injection or reduced emission requirements.

Environmental Services –Product Development



Program defines electrode geometry to increase field strength and drive particles to the collecting plate quicker.



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Environmental Services –Product Development

Max-9 Enhancements

- Several enhancements to the Max-9 are being demonstrated:
  - Utilization of pleated elements to decrease foot print.
  - Pre-collection element to reduce cleaning requirement.
  - Utilization of SMPS power supply.
- The technologies are being demonstrated at MeRC and on the transportable unit.
- Intent is to reduce foot print, increase cleaning interval.

Environmental Services –Product Development

Non Carbon Mercury Sorbents

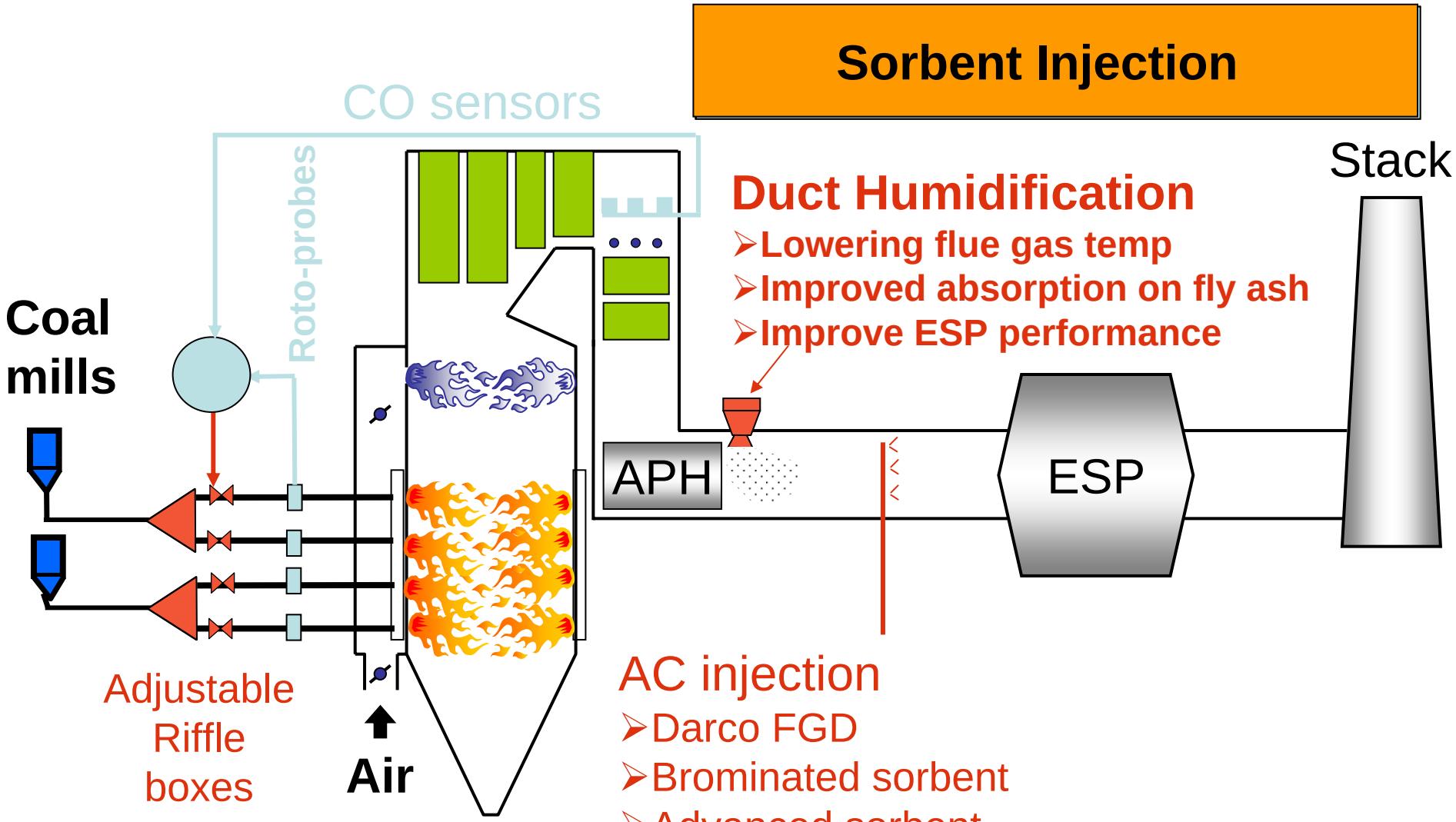
- Multiple initiatives are underway to develop non carbon based mercury sorbents:
  - Reactive metal oxides
  - Catalyst coated oxides
- Intent is to cost effectively:
  - perform equal to or better than brominated PAC.
  - not interfere with ESP operation.
- Development also addresses co-benefits of SOx and NOx reduction.
- Expect demonstrations to begin 2007.

Mercury Control Approach

A system wide approach is recommended to reduce mercury emissions by 90% on PRB coals:

- Balance burners to control LOI
- Stage combustion air to oxidize mercury
- Utilize existing ESP to capture 95% of dust.
- Use EGC to cool gas stream when necessary
- Integrate FGC into control approach
- Introduce sorbent for mercury adsorption
- Capture particulate in Max-9 fabric filter.

Mercury Control System Demonstration



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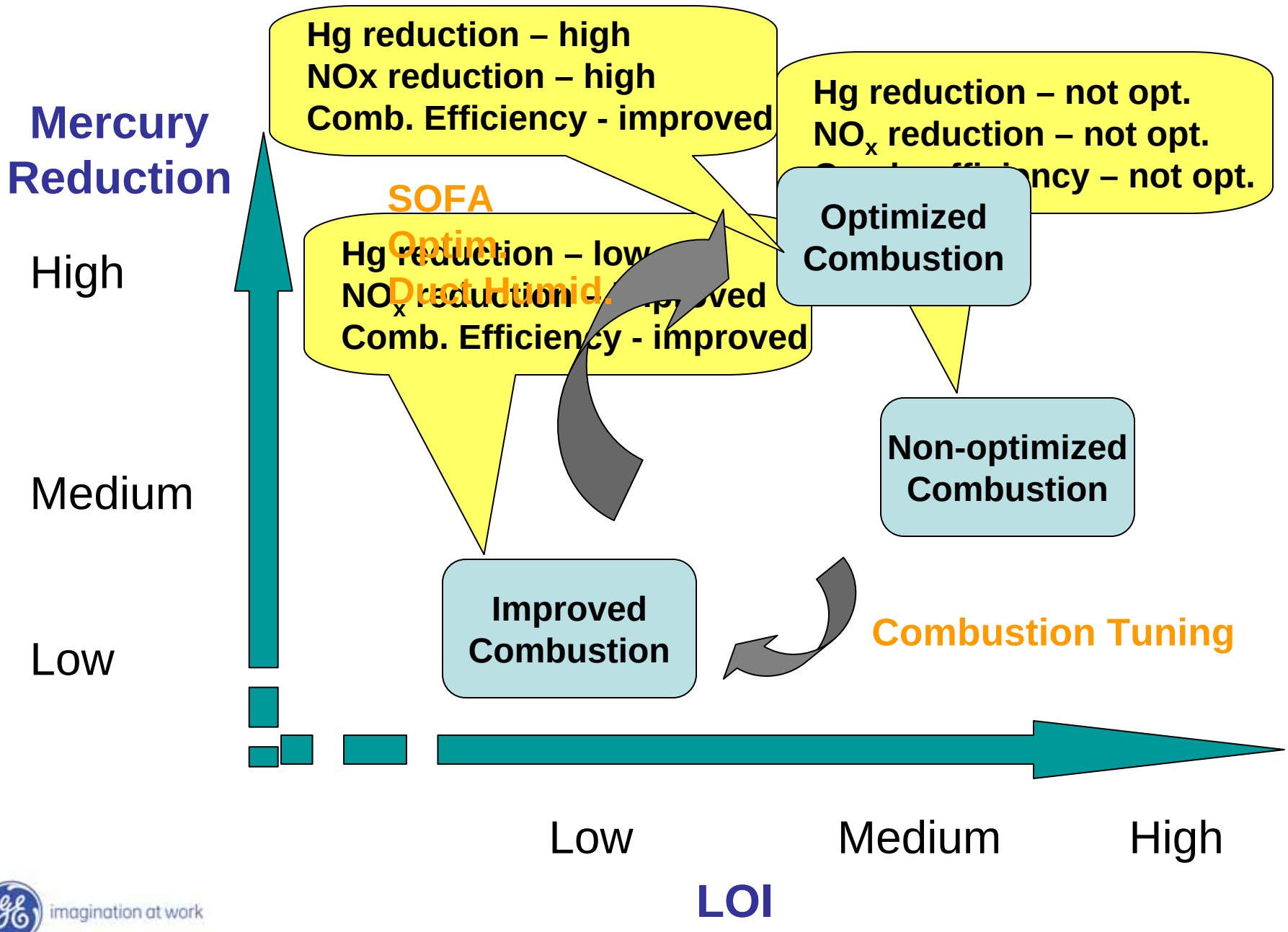
Sequence of Control

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