

Reinhold Environmental Ltd.



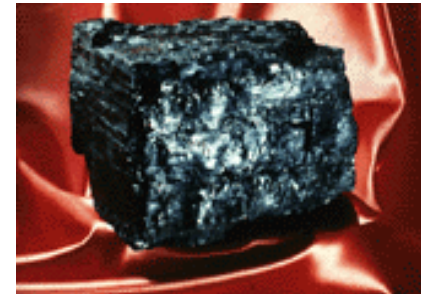
2008 APC Round Table
& Expo Presentation

July 13-15, 2008, in Savannah, GA

“SBS Injection Technology: Overview”

Reinhold Environmental
July 15, 2008

Proprietary Material



Acid Mist Control

SBS Injection™ Technology

Features

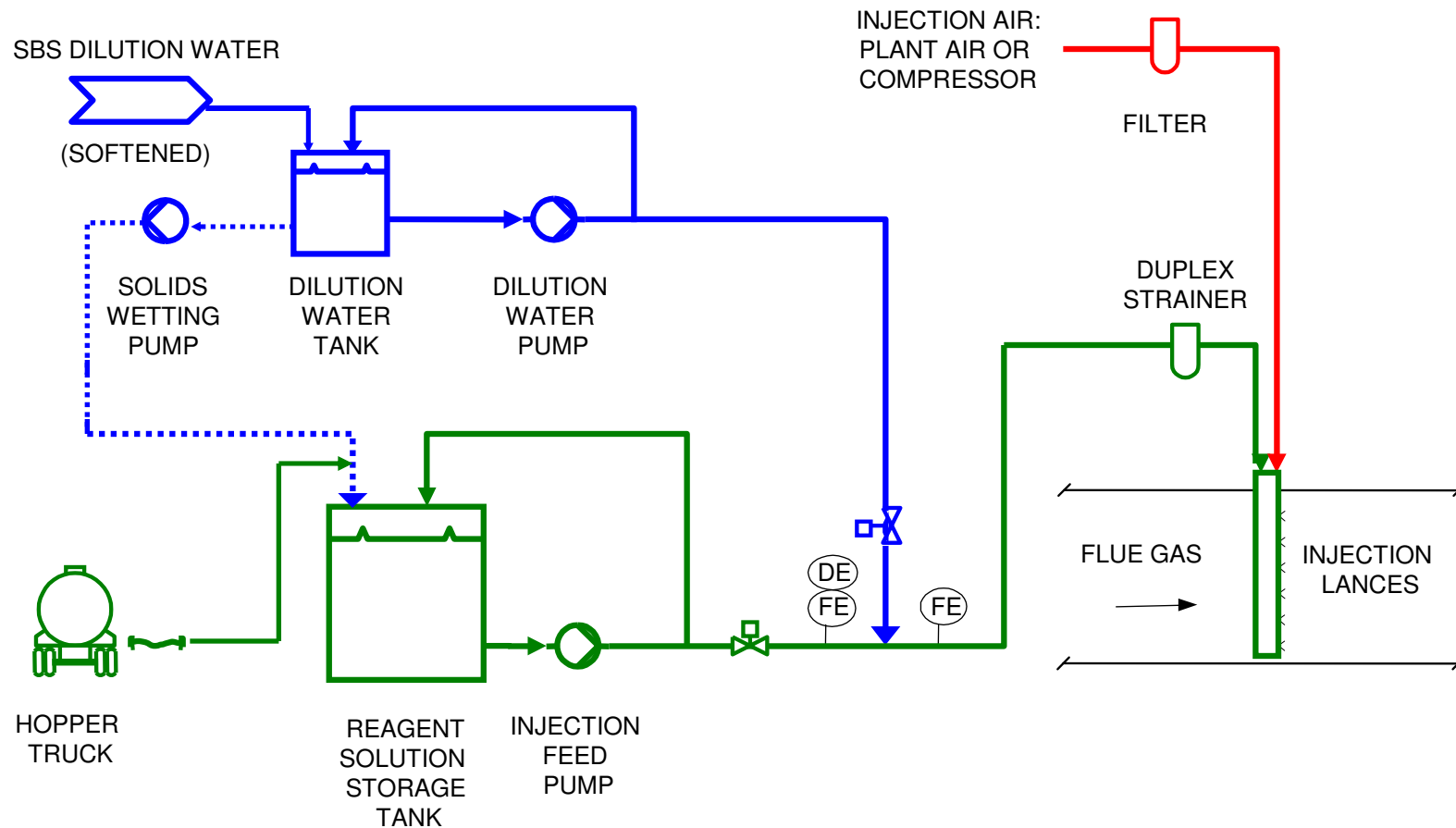
- Patented Technology
- Simple Solution Injection
- Dual-Fluid Atomization
- Sodium-Based Reagent
- Selective Reactions
- High SO₃ Removal
- Low Injection Rate
- Product Collected in ESP

Benefits

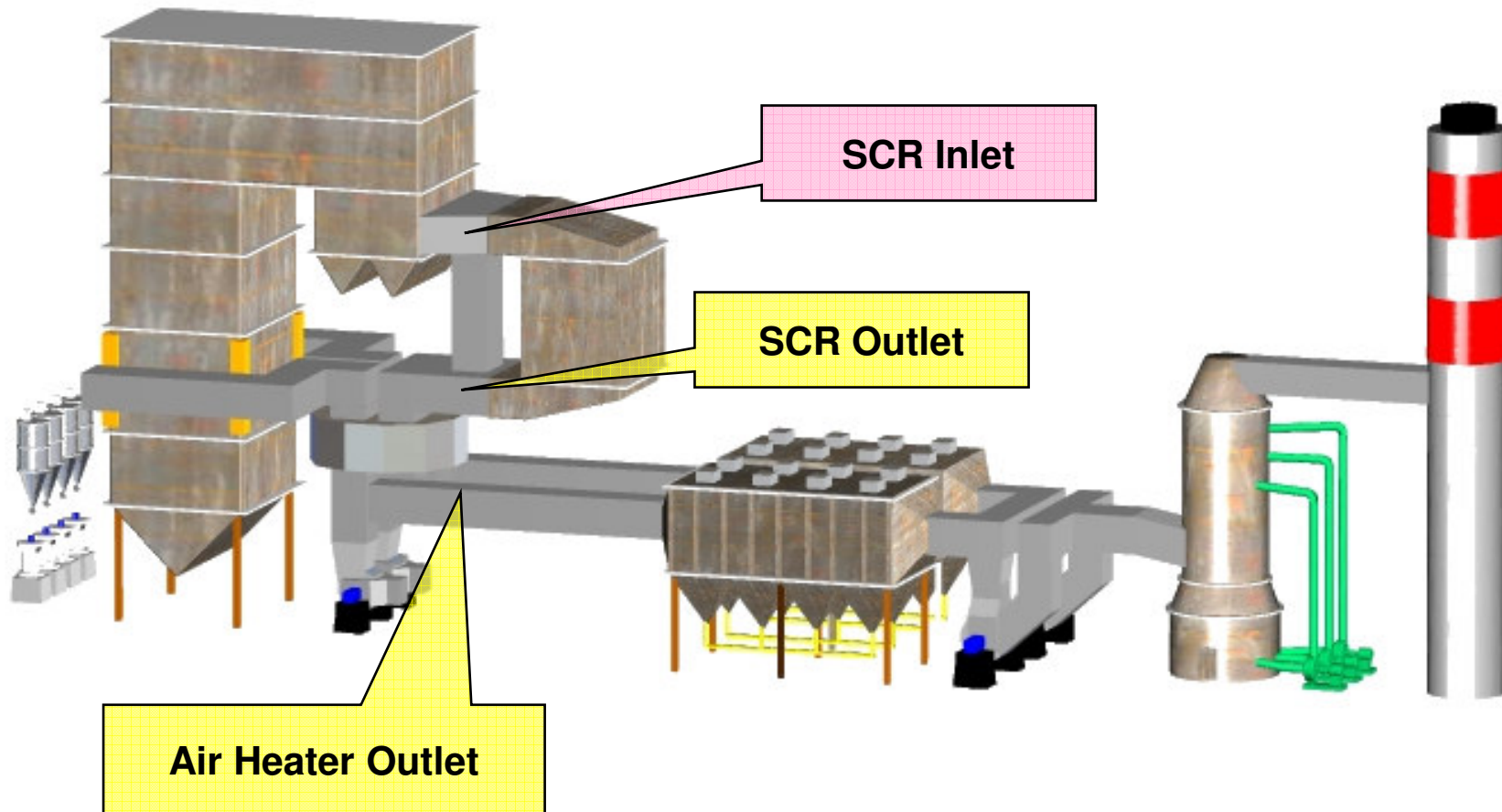
- Opacity Elimination
- Corrosion Reduction
- ESP Enhancement
- HCl and Se Removal
- Potential Heat Recovery
- SCR/SNCR Flexibility
- Hg Capture Enhancement
- CO₂ Reduction

Maximum Benefits with “Upstream” Injection

Simplified Process Flow Diagram



SBS Injection Locations



SBS Injection Installations

Utility	Plant	Location	MW	Design SO3	Injection Location	Reagent	Operating Season	Startup Date
FirstEnergy	Mansfield 1-3	Shippingport, PA	3x860	80	Air Heater Inlet	Sodium Sulfite	Year-round	March 2003
TVA	Widows Creek 7	Stevenson, AL	550	54	Air Heater Inlet	Sodium Sulfite	Ozone	April 2003
NIPSCO	Bailly 8	Porter, IN	365	59	Air Heater Outlet	Sodium Carbonate	Ozone	April 2004
Vectren	Culley 3	Newburgh, IN	287	48	SCR Outlet	Byproduct SBS	Year-round	July 2004
PPL	Montour 1-2	Washingtonville, PA	2x765	42	Air Heater Outlet	Sodium Carbonate	Ozone	Aug 2004
Duke Energy	Gibson 1-5	E. Mt. Carmel, IN	5x650	110	Air Heater Outlet	Sodium Carbonate	Ozone	May 2005
DP&L	Killen 2	Manchester, OH	635	34 / 36	Econ Outlet SCR Outlet	Sodium Carbonate	Year-round	Oct 2007
IP&L	Harding St 7	Indianapolis, IN	465	58	SCR Outlet	Sodium Carbonate	Year-round	Nov 2007
NIPSCO	Bailly 7	Porter, IN	180	59	SCR Outlet	Sodium Carbonate	Year-round	April 2008
DP&L	Stuart 1-4	Aberdeen, OH	4x620	90	Econ Outlet	Sodium Carbonate	Year-round	July 2008

12,500 MW Installed on 20 Boilers; ~3000 MW Planned

Ultra-High Removal Experience

Plant	SO3 Inlet (ppmv-d, 3% O2)	SO3 Outlet (ppmv-d, 3% O2)	SO3 Removal (%)	H2SO4 Emission (lb/MMBtu)	Particulate Control Device	SO2 Control Device
A	32	1.3	95.9%	0.0027	ESP	WFGD
B	65	1.6	97.5%	0.0031	Venturi Scrubber	WFGD
C	36	1.3	96.4%	0.0046	ESP	None
D	66	1.2	98.2%	0.004	ESP	WFGD
E	45	0.2	99.6%	0.0003	ESP	WFGD
F	15	0.6	96.0%	0.0022	ESP	WFGD

Performance guarantees of <0.005 lb H₂SO₄/MMBtu offered



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cloud-like plume
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For more information







URS
SBS Injection
Technology

SBS INJECTION SKD SK-300

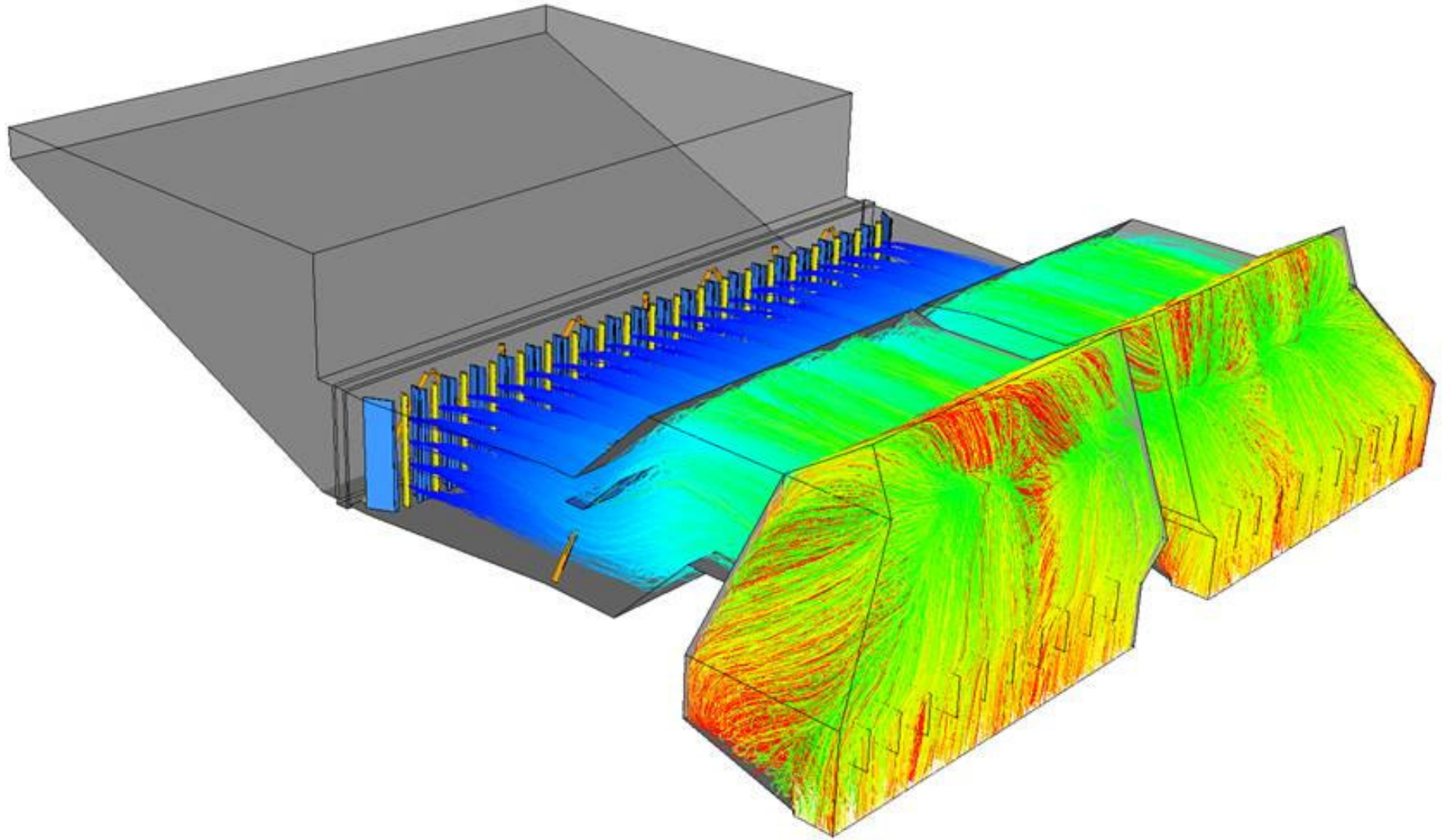
SBS INJECTION SKD SK-300

URS INJECTION SKD SK-300
PROCESSING UNIT

URS
SBS INJECTION SKD SK-300









Injection Downstream of Air Heater



2005 Ozone Season

NIPSCO Bailly Unit 8

2006 Ozone Season



Injection Upstream of Air Heater

NIPSCO Bailly Unit 7

After ~ 4 Weeks Operation

Technology Economics

- Capital Costs
 - ✓ \$5–15/kW
 - ✓ Reagent tank, injection skid, Injection manifold, injection lances, compressors
- Operating Costs
 - ✓ <\$500/ton SO₃ Removed
 - ✓ Reagent, license fee, power, water

Summary

- Proven experience (20 units – 12,500 MW)
- Very high SO₃ removal achieved (>95%)
- Significant Plant Operational Benefits
 - ✓ Corrosion Reduction
 - ✓ NO_x Removal Improvement
 - ✓ AH Reliability Improvement
 - ✓ Heat Rate Improvement
 - ✓ Mercury Capture
- Low operating cost (<\$500/ton SO₃)
- Low capital cost (\$5-15/kW)
- Further Technology Advances Underway