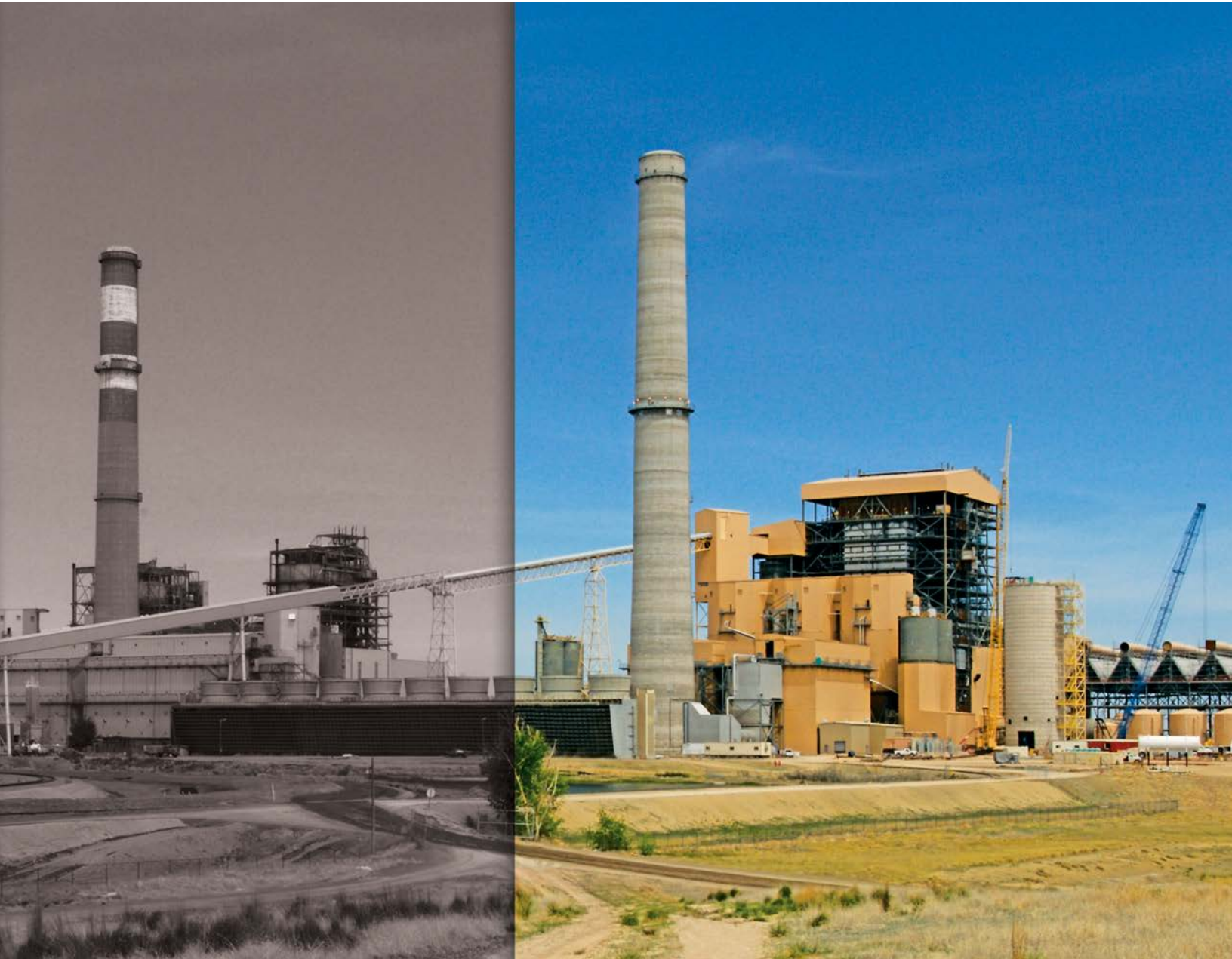


Your Plant Can Thrive with Babcock & Wilcox Aftermarket Products and Services



Boiler Performance Enhancements | Upgrade/Rebuild Projects
Replacement Parts | Construction Services



Your plant can thrive

with B&W parts, upgrades, controls and services for components and equipment

Controls and Diagnostic Systems

- Advanced performance technologies
- Precipitator controls and software
- Boiler control and monitoring systems

pg. 9

Boiler

- Pressure parts
- Non-pressure parts
 - Air heaters
 - Fans

pg. 10

Post-Combustion NO_x Control

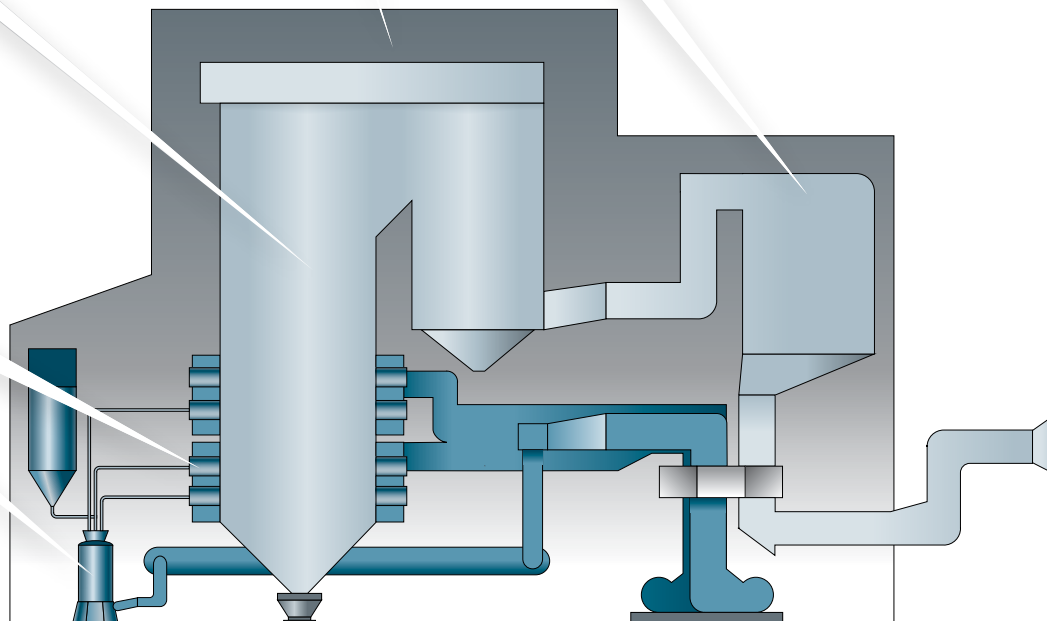
- Selective catalytic reduction
- Selective non-catalytic reduction

pg. 20

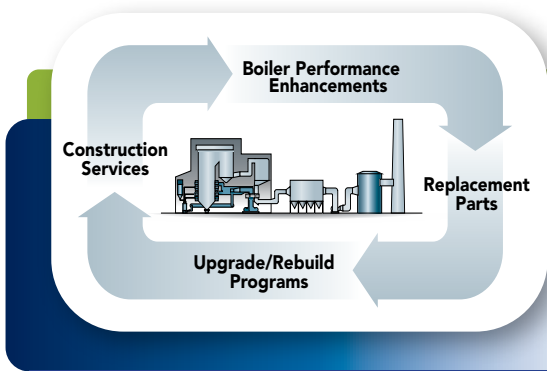
Combustion Systems

- Pulverizers
- Low NO_x burners
- Igniters and scanners
- Overfire air systems
- Cyclone furnaces

pg. 4



throughout the entire power plant.



Aftermarket Lifecycle Support Products and Services

How do you maintain your competitive edge in today's market? Are you operating at peak efficiency and maximizing the returns on your assets? Are you partnering with a proven service provider you can rely on to provide ongoing maintenance support, quality replacement parts and new technologies when needed to meet the latest environmental regulations? These are some of the reasons to choose Babcock & Wilcox (B&W) as your preferred one-stop aftermarket supplier for your entire plant.

Mercury, Acid Gas and HAP Control

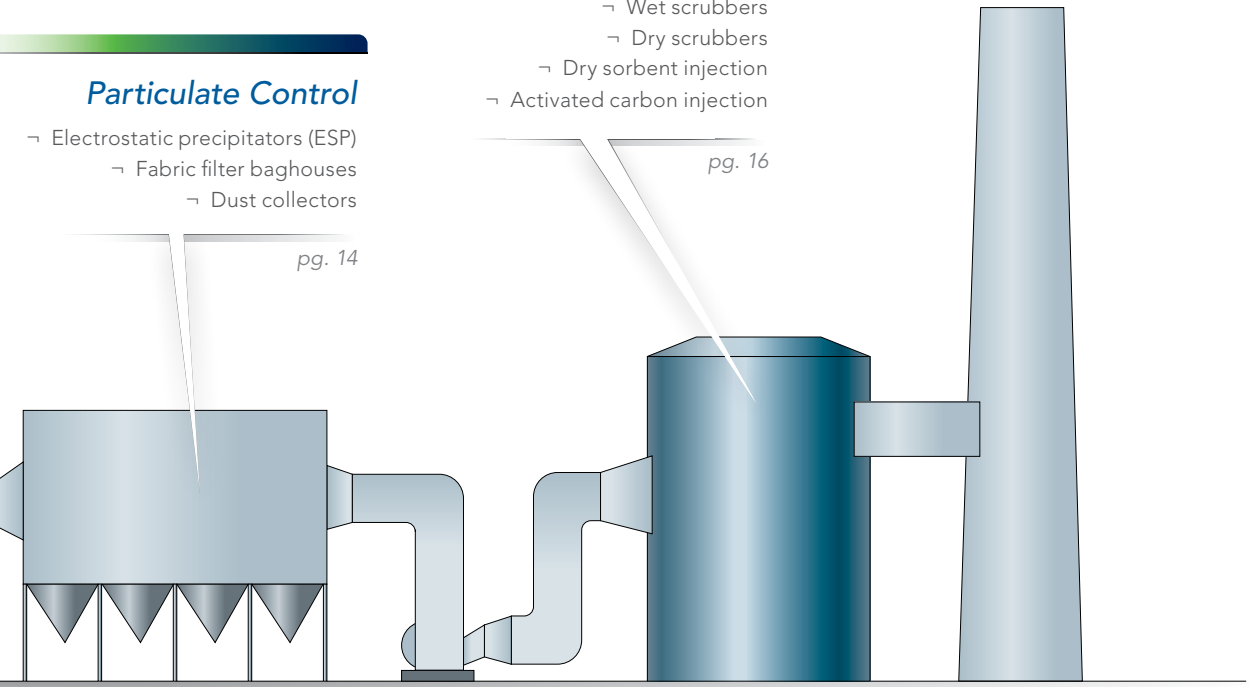
- Wet scrubbers
- Dry scrubbers
- Dry sorbent injection
- Activated carbon injection

pg. 16

Particulate Control

- Electrostatic precipitators (ESP)
- Fabric filter baghouses
- Dust collectors

pg. 14



In addition to B&W equipment we provide parts, systems and services for all major OEM suppliers, including:

- | | |
|------------------------------------|-----------------------------|
| → GE/Alstom/Combustion Engineering | → Babcock Power/Riley Power |
| → (Amec) Foster Wheeler | → Doosan |
| → Mitsubishi Hitachi Power Systems | |

Combustion Systems — Pulverizers

B&W Roll Wheel™ and E/EL Pulverizers

Capabilities/Competencies

Modifications and improvements

- High wear-resistant, severe duty castings
- Rotating throat
- DSVS® rotating classifier
- Wide profile roll wheels
- Erosion-resistant ceramic components

Replacement parts

Roll wheel rebuilds and exchanges

Gear box rebuilds and exchanges

Inventory management programs

Technical support – inspections, testing, tuning, training

Potential Benefits

Reduced operating and maintenance costs

Capacity maintained throughout wear cycle

Lower pressure drop

Flexible load-following capability

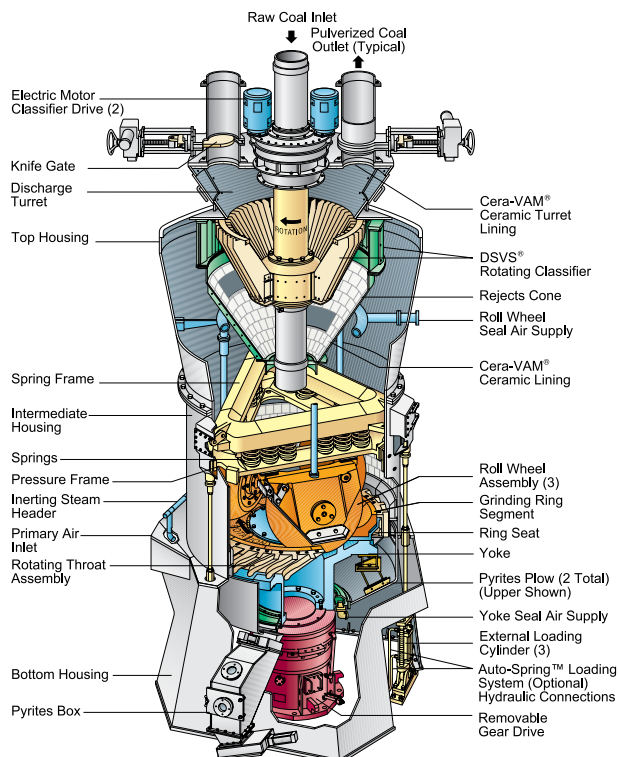
Excellent turndown

Improved component wear life with high wear castings and ceramic protection

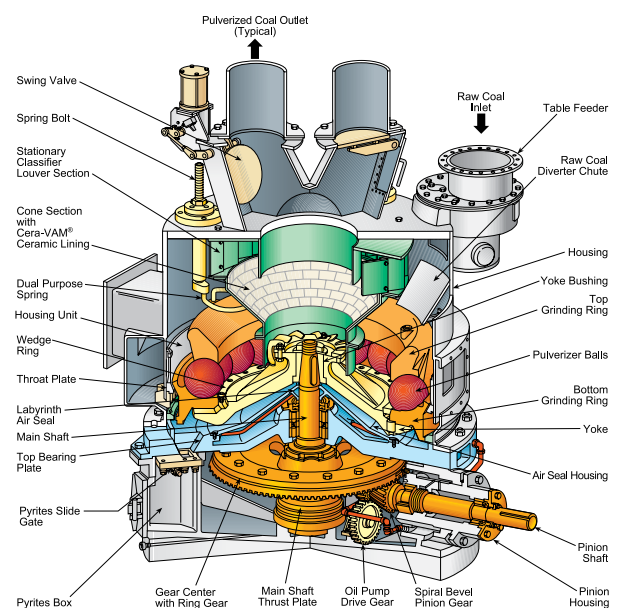
Improved combustion efficiency (reduced unburned carbon) when used with a DSVS classifier

Ability to achieve optimum fineness when grinding a wide range of coals via online adjustment of roll wheel pressure and classifier speed

Roll Wheel™ Pulverizer



E/EL Pulverizer



CE-Type Pulverizers (GE/Combustion Engineering/Alstom)

Capabilities/Competencies

Replacement parts for Combustion Engineering (CE)
shallow bowl pulverizers and mill size 633 deep
bowl pulverizers

No fee inventory management programs

Journal rebuilds for all pulverizer sizes

Extended life journal assemblies

Xwin® high wear materials technology

Grinding zone and millside area upgrades

Technical support – inspections, testing,
tuning, training

New product development

Potential Benefits

Enhanced performance and reliability

Increased mill operating cycles

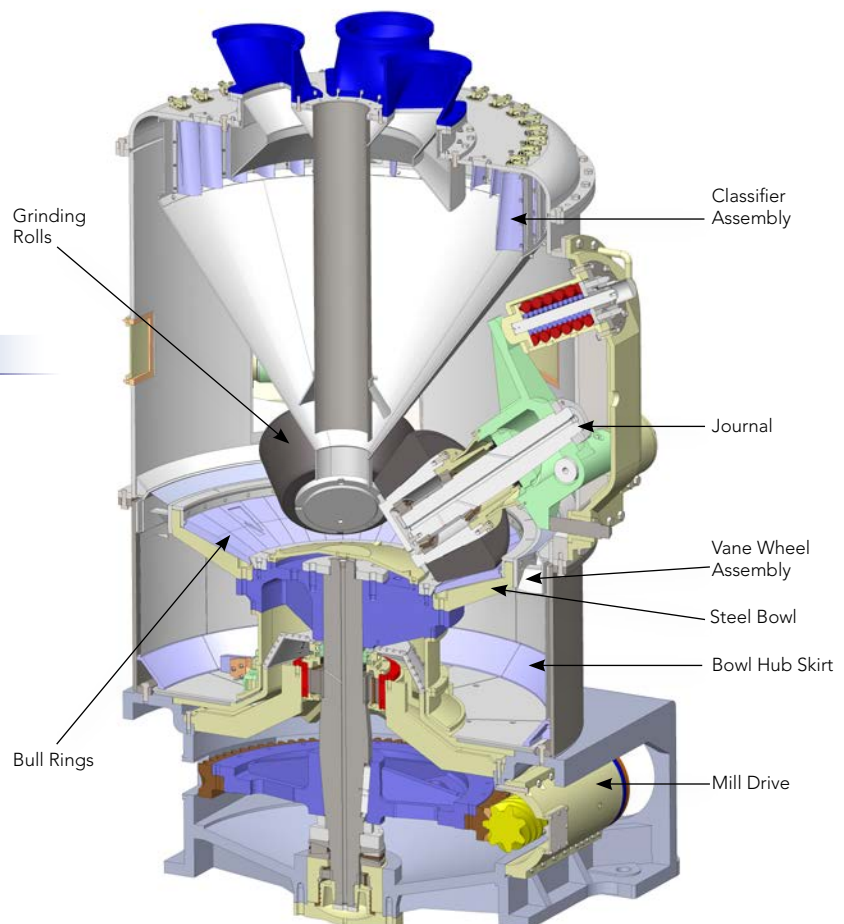
Improved availability

Reduced on-site inventory

Industry leading technical support

Magotteaux Strategic Alliance

A strategic supplier relationship combines the benefits of Magotteaux's metallurgical expertise and experience in high wear, abrasion-resistant material with B&W's expertise in pulverizer and boiler design, operation and optimization.



Combustion Systems — Burners

Combustion System Firing Equipment

Capabilities/Competencies

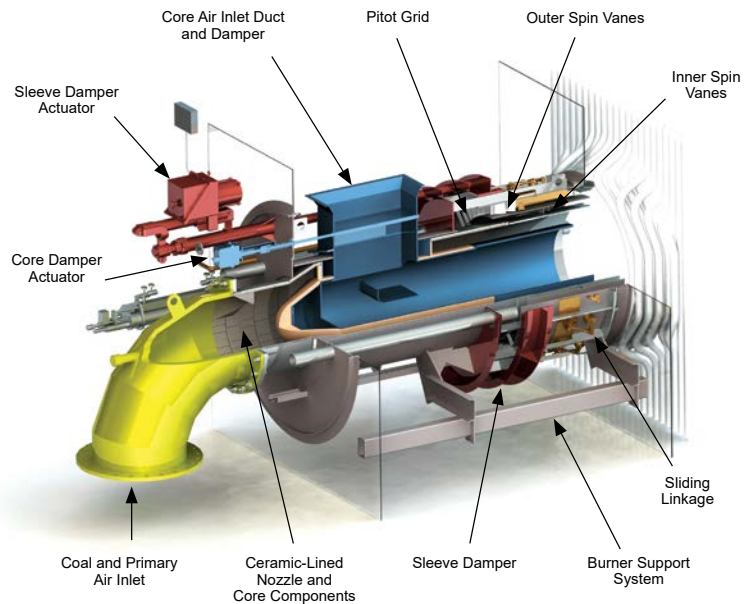
Low NO_x coal, oil, natural gas, and industrial process gas firing equipment

Complete overfire air systems specifically designed for your operating conditions, fuels and furnace envelope

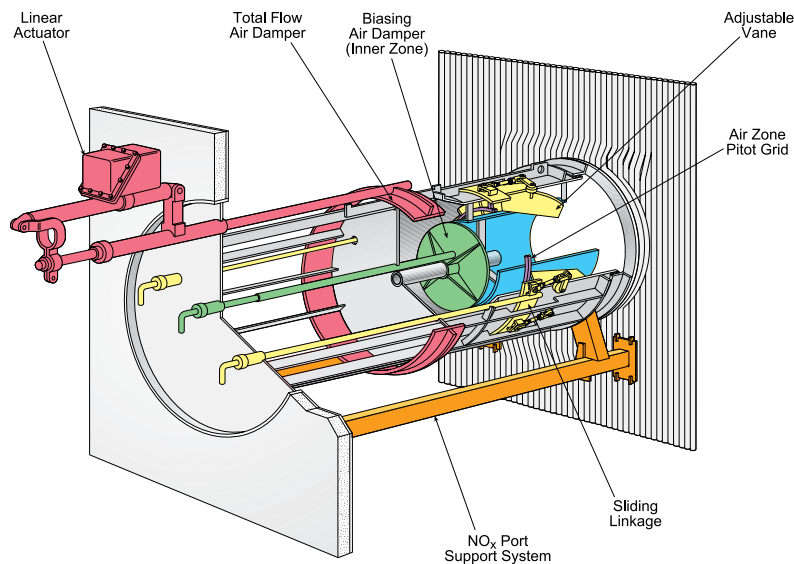
Integrated combustion systems design approach

- Fuel delivery and preparation system
- Flame safety and burner management system
- Combustion controls
- Evaluation of downstream impact to boiler cleaning equipment, ash handling systems and emissions control equipment

AireJet® Low NO_x Coal Burner



Overfire Air Port



Potential Benefits

Multiple burner equipment options customized to fit your needs

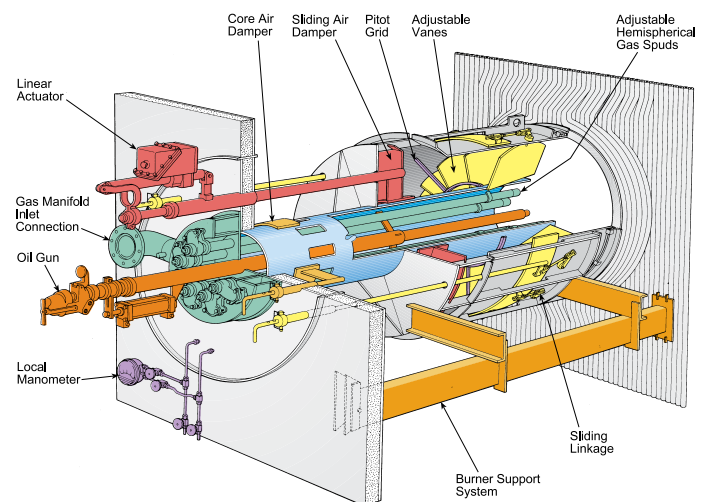
- Unstaged low NO_x burner systems to minimize furnace corrosion potential firing high sulfur fuels (DRB-4Z burner)
- Minimize SCR reagent costs
- Maximize unit turndown
- Minimize unburned combustibles in fly ash to improve boiler efficiency and support sale/beneficial use

Consistent emissions performance with set-and-forget burner adjustments

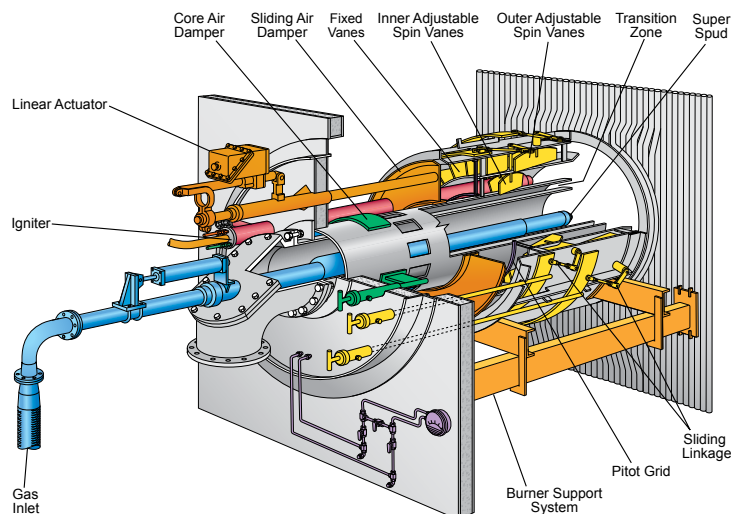
Burner equipment specifically designed for minimal maintenance costs

- Simple fuel element geometry to minimize flow disturbances including integral erosion protection
- Burner designs do not rely on flame holder devices prone to overheating and coking to maintain flame stability and achieve emissions performance

XCL-S® Low NO_x Oil and Gas Burner



DRB-4Z® Dual Fuel Burner



Pioneers in Low NO_x Combustion Systems

Our low NO_x combustion technologies have been successfully applied to a broad range of B&W and non-B&W boilers with varying fuel characteristics and boiler arrangements.

Combustion Systems — Igniters and Scanners

Igniters — Wall-fired Boilers

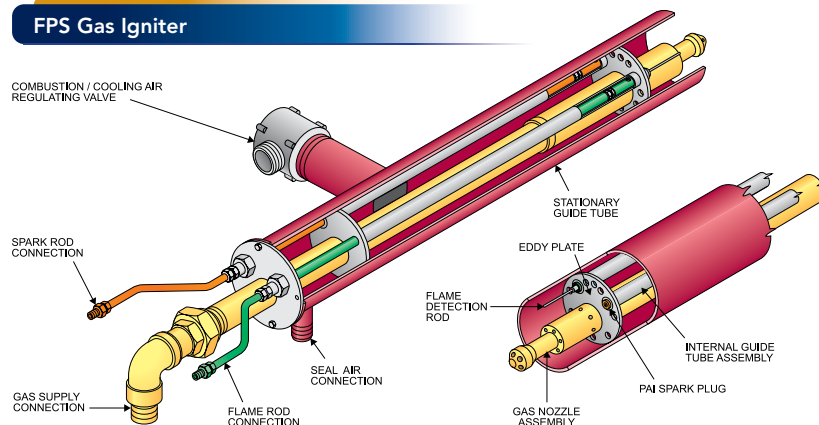
Capabilities/Competencies

- Fossil Power Systems (FPS®) oil and gas igniters
- Flexible application of PLC logic to meet burner management system requirements
- Comprehensive analysis for customized control to meet individual design and operational requirements
- Elimination of moving parts allowing a near maintenance-free igniter
- Integral flame rod detector which senses only the igniter in any burner/boiler configuration
- Horn igniters for corner-fired applications
- Complete line of scanners for all fuels in utility and industrial applications

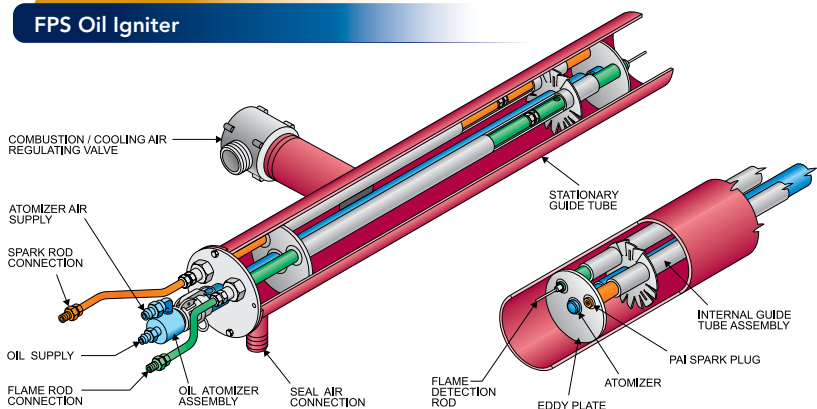
Potential Benefits

- Proven performance
- Lower opacity
- Reliable ignition
- Superior flame stability
- Integral flame detection
- Fuel savings during startup
- Fixed position; no moving parts
- Low cost plug-in designs
- Low maintenance
- Proven mechanical reliability and operation
- Reliable flame recognition

FPS Gas Igniter

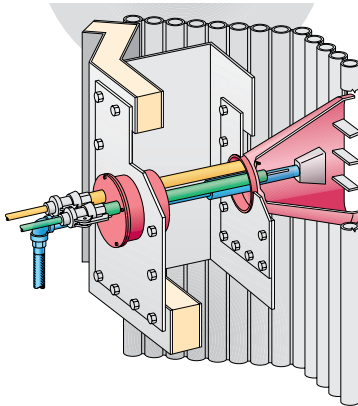


FPS Oil Igniter

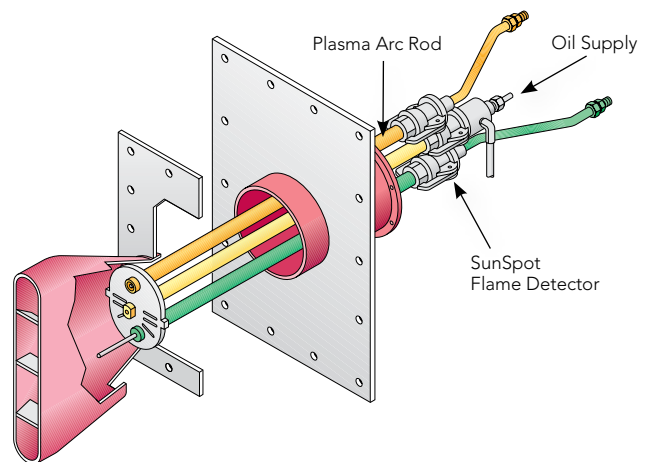
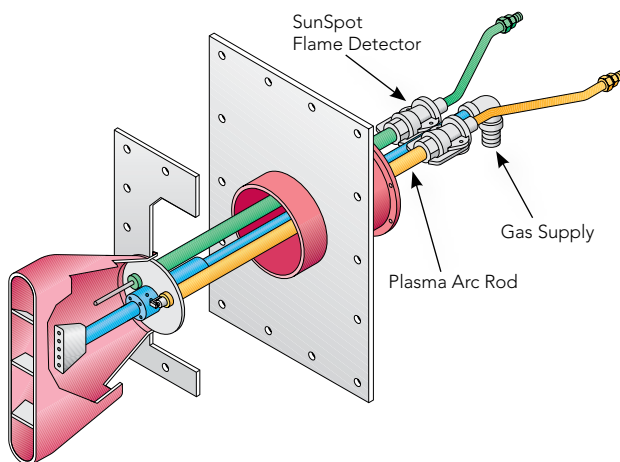
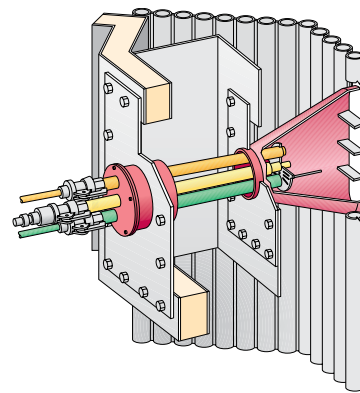


Igniters — Corner-fired Boilers

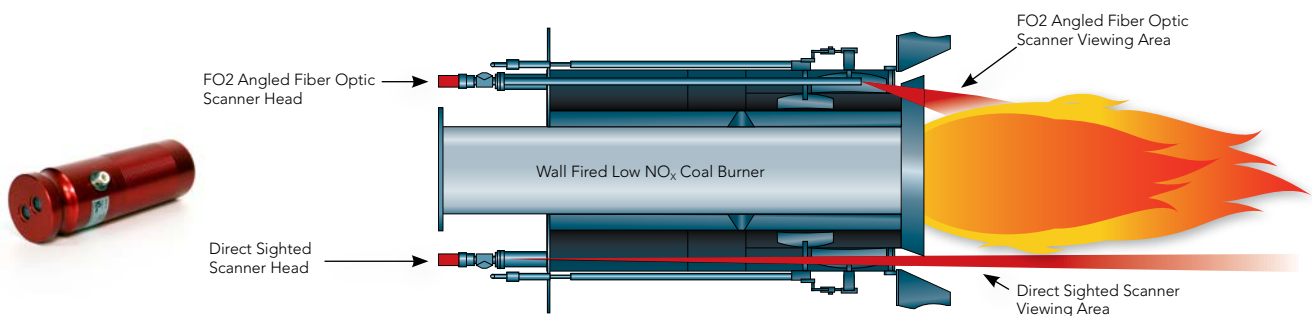
Gas Horn Igniter



Oil Horn Igniter



Scanners



Boiler Upgrades and Replacement Components

Capabilities/Competencies

Modifications, improvements and in-kind replacements

- Pressure parts
- Non-pressure parts

Boiler capacity increases

Conversions from base load to cycling operation

Circulation improvements

Fuel conversions and repowering

Air heaters and fans, replacement in-kind or upgrades

Corrosion and erosion protection

Emissions reductions

Potential Benefits

Improve ramp-up and turn-down capabilities for rapid grid response

Solve existing maintenance or operational issues

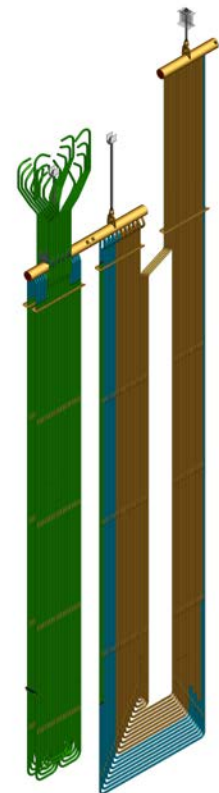
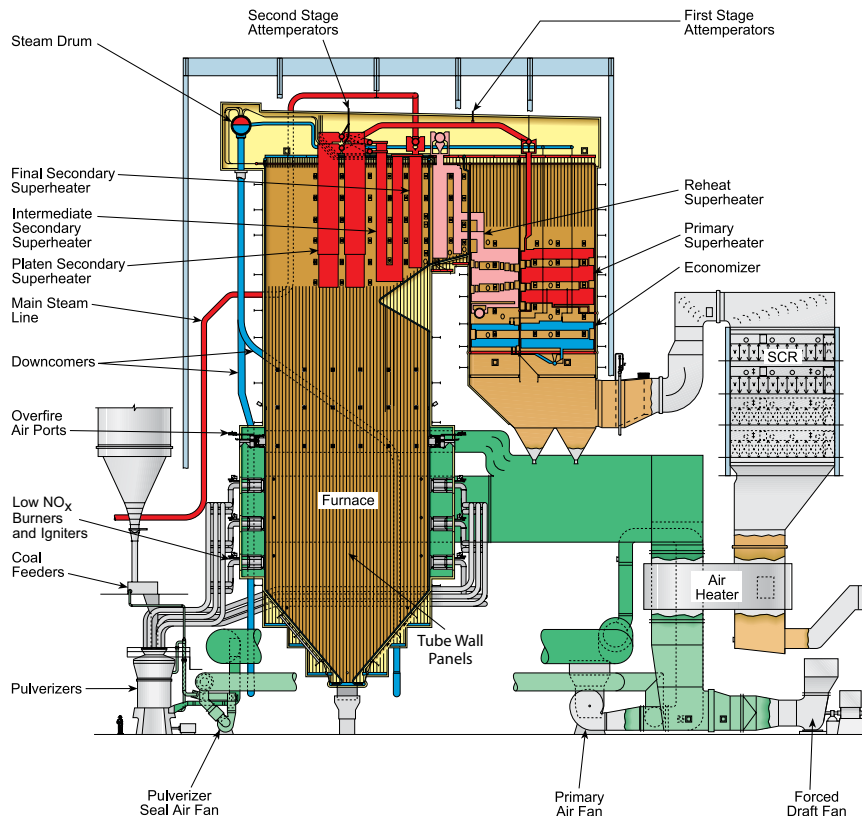
Design for fuel flexibility and cost savings

Optimize plant efficiencies

Lower maintenance costs

Engineered Upgrades for most OEMs

Our experience with non-B&W boilers includes Foster Wheeler, GE/Alstom/Combustion Engineering (CE), Babcock Power/Riley to name just a few



Electrostatic Precipitators

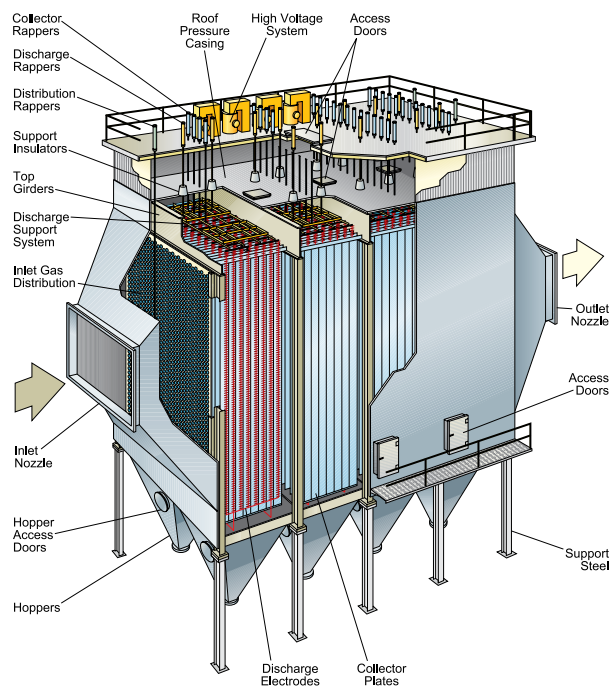
Capabilities/Competencies

- New installations
- Engineered upgrades, rebuilds and conversions
- Wet and dry technologies
- Collector plates
- Rapper components and parts
- Discharge electrodes
- Insulators
- Single- and 3-phase power supplies and controls
- Access doors and door seals
- Electrical performance enhancement hardware and software
- 24/7 remote diagnostics

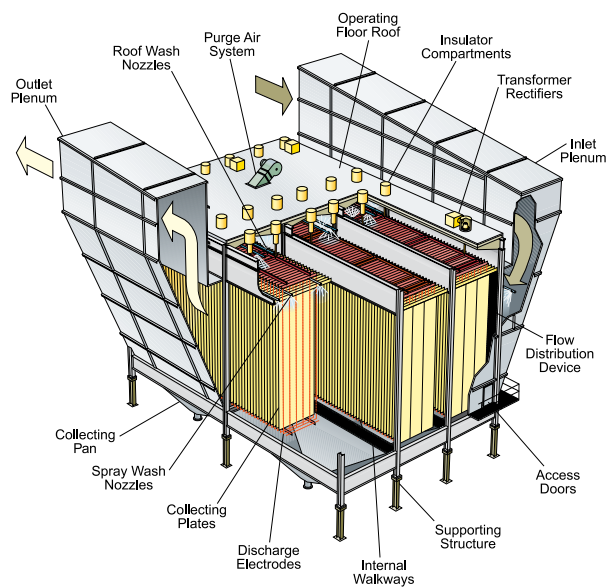
Potential Benefits

- Decreased emissions
- Reduced operating and maintenance costs
- Improved reliability and safety
- Enhanced performance and efficiency
- Parts availability for quick turnaround and reduced downtime

Dry Electrostatic Precipitator



Wet Electrostatic Precipitator



Engineered Upgrades

Designed to reduce operating and maintenance costs, improve reliability and safety, and enhance overall performance and efficiency, regardless of OEM. Our experience includes B&W Precipitech™, Joy Western, Buell, BHA and GE, to name just a few

Fabric Filters

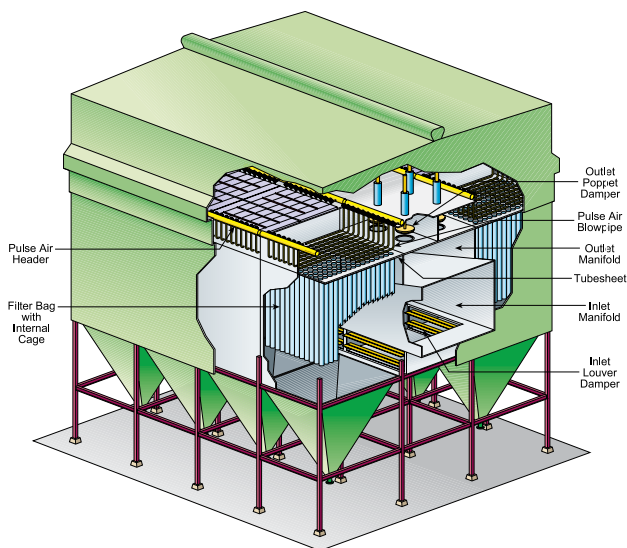
Capabilities/Competencies

- New installations
- Engineered upgrades and rebuilds
- Variety of configurations to accommodate site-specific requirements
- Integrated solutions with FGD and sorbent injection provides additional criteria and/or hazardous air pollutant (HAP) removal
- Flexible control systems to optimize operating modes and cleaning logic
- Upgrades and modifications
- ESP conversions to fabric filter technology
- Replacement filter bags

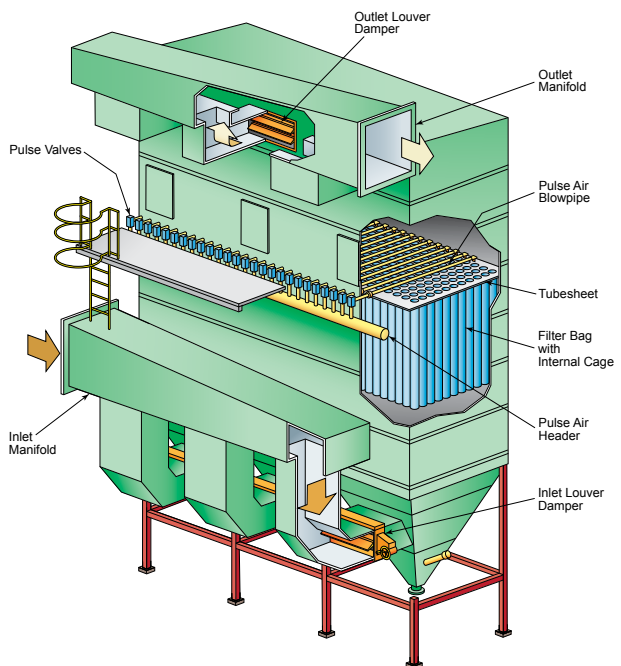
Potential Benefits

- Low emissions over a wide range of operating conditions
- Reduced maintenance and operating costs
- Pulse jet technology provides owners with flexible operation and control

Pulse Jet Fabric Filter – Roof Hatch Design



Pulse Jet Fabric Filter – Walk-in Plenum Design



Pulse Jet Technology

- Provides improved cleaning efficiency, reduced pressure loss, lower compressed air use and power consumption, and increased bag life.

Mercury, Acid Gas and HAP Control

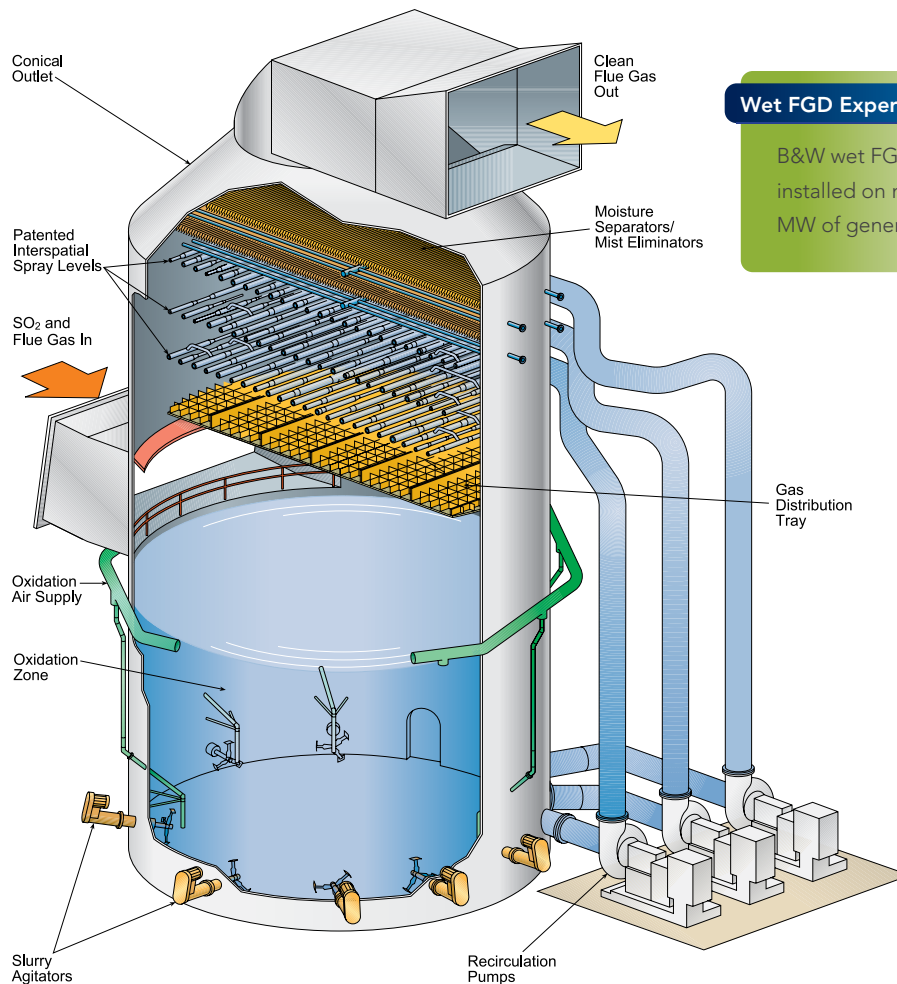
Wet Scrubbers

Capabilities/Competencies

- New installations
- Engineered upgrades and rebuilds
- Lime, magnesium-lime, limestone or sodium chemistries
- Inhibited or forced oxidation systems
- Absorber tray retrofits
- Optimized absorber spray coverage (headers and nozzles)
- Control system upgrades
- Tuning, inspections, training and operation evaluation

Potential Benefits

- Increased SO₂ removal efficiency
- Increased reliability and performance of existing systems
- Eliminate or reduce flue gas bypass
- More precise process control for varying unit load and reduced low load operation
- Reduced limestone consumption
- Reduced off-spec gypsum
- Minimized or eliminated wastewater effluent stream



Wet FGD Experience

B&W wet FGD technology is installed on more than 127,000 MW of generating capacity.

Mercury, Acid Gas and HAP Control

Mercury Control

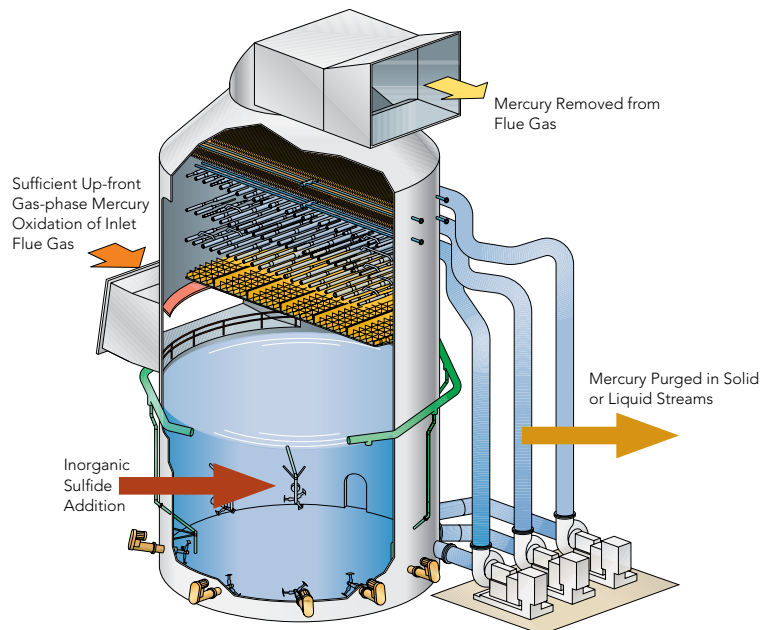
Capabilities/Competencies

- Powdered activated carbon injection systems
- Calcium chloride fuel injection systems
- Absorption Plus (Hg)[®] injection of inorganic sulfide to increase mercury removal in a wet scrubber
- An integrated approach for particulate, mercury and acid gas removal

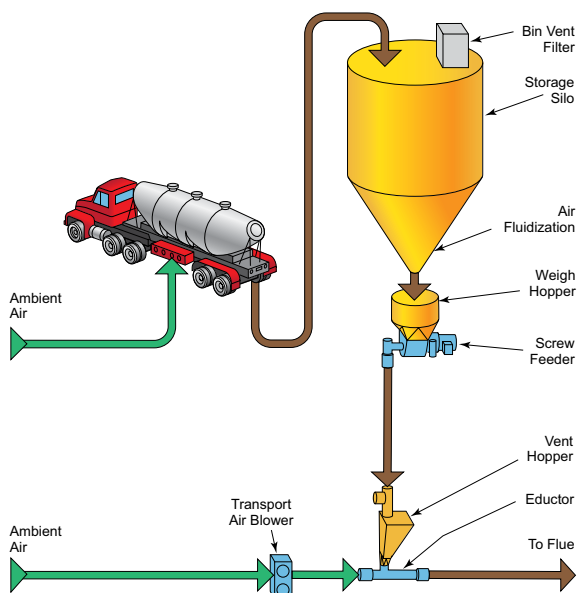
Potential Benefits

- Reduced mercury emissions
- Low overall lifecycle cost
- Optimizes PAC consumption

Absorption Plus (Hg)[®] Mercury Control



Activated Carbon Injection



Mercury, Acid Gas and HAP Control

Dry Scrubbers — Spray Dryer Absorbers

Capabilities/Competencies

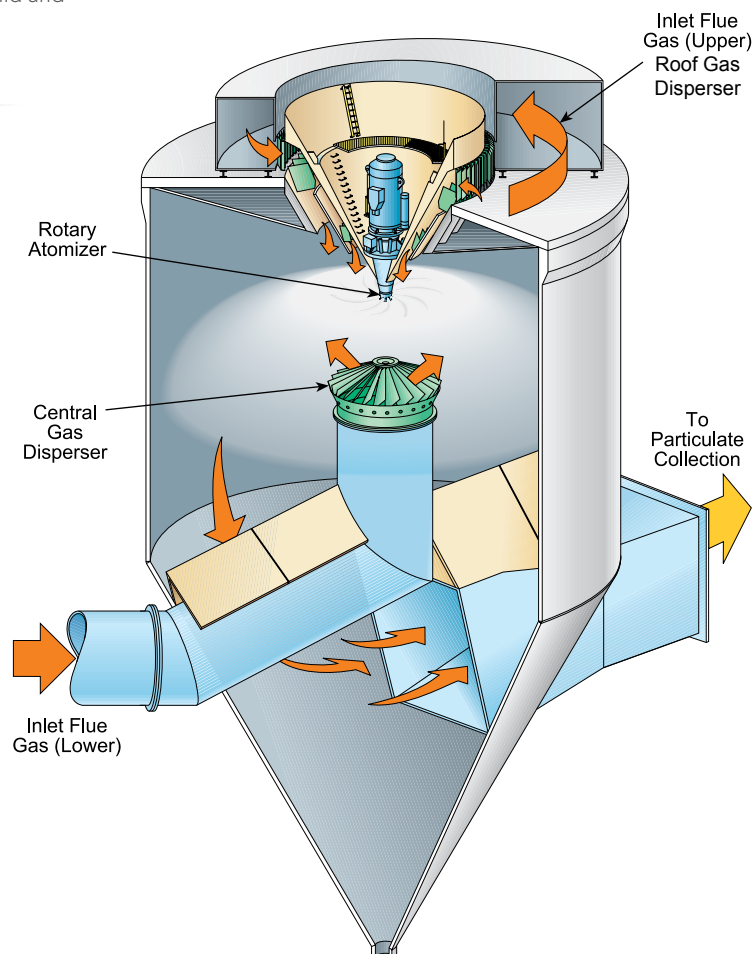
- New installations
- Engineered upgrades and rebuilds
- Control logic and instrumentation upgrades
- Tuning, inspections, training and operation optimization
- Atomizer and atomizer motor servicing
- Atomizer component upgrades
- Replacement GEA Niro atomizer parts
- Gas disperser component updates and replacement
- Back-up atomization systems
- Spray chamber reinforcement, rebuild and replacement
- Gas flow distribution optimization

Potential Benefits

- Reduced lime consumption
- Easily integrated with an existing fabric filter (pulse jet or reverse air)
- Increased acid gas (SO_2 , SO_3 , HCl , HF) removal efficiencies
- Increased reliability and performance of existing systems
- Elimination of wastewater streams
- More precise process control for varying unit load and reduced low load operation
- Dedicated parts warehouse for fast delivery and reduced downtime

SDA Technology

Removal efficiencies
as high as 98%



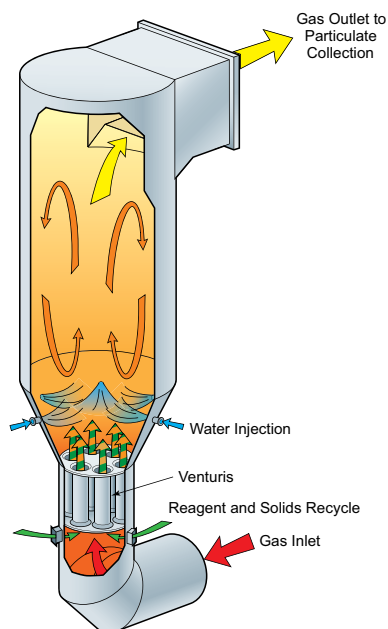
Dry Scrubbers — Circulating Dry Scrubbers

Capabilities/Competencies

- New installations
- Engineered upgrades and rebuilds
- Controls system upgrades
- Gas flow distribution optimization
- Tuning, inspections, training and operation evaluation
- Solutions for material handling issues

Potential Benefits

- Simple process control and maintenance
- Increased acid gas (SO_2 , SO_3 , HCl , HF) removal efficiencies
- Increased reliability and performance of existing systems
- Reduced lime consumption
- Elimination of wastewater streams



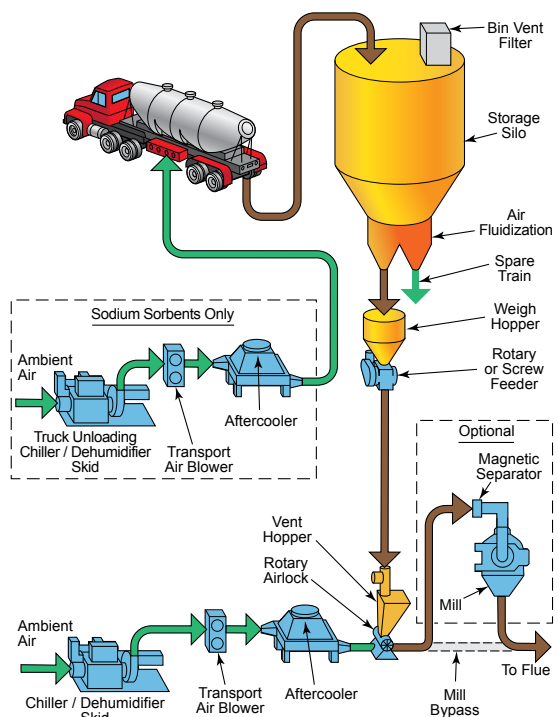
Dry Sorbent Injection Systems

Capabilities/Competencies

- Flexible designs to capture SO_2 , SO_3 and HCl
- Designed to utilize a variety of reagents (hydrated lime, sodium bicarbonate or trona)
- CFD modeling to optimize sorbent-to-gas distribution with static mixer/lance design and configuration

Potential Benefits

- Low cost multi-pollutant solution
- Optimized reagent utilization
- High reliability of storage, conveying and injection system
- Improved performance of existing emissions control systems (SDA/PJFF or wet FGD)



Post-Combustion NO_x Control

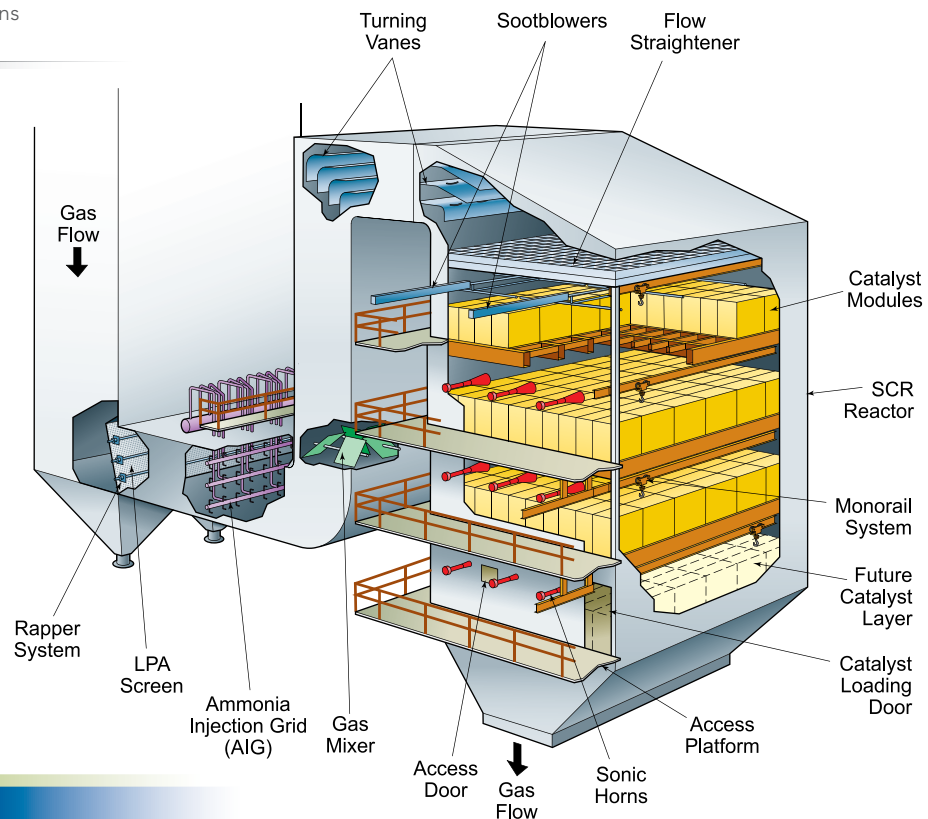
Capabilities/Competencies

- Selective catalytic reduction (SCR) and non-catalytic reduction (SNCR) technologies
- New installations
- Engineered upgrades and rebuilds
- V-Temp™ economizer system, an innovative and cost-effective method of controlling SCR flue gas inlet temperatures
- CFD modeling for ammonia injection and mixing design
- Combustion additive for enhanced catalyst performance
- New or retrofit applications

Potential Benefits

- Proven NO_x reduction technologies
- Vast experience — SCRs installed on nearly 33,000 MW of generating capacity
- Extensive PRB coal experience
- Modularized construction limits impact on plant operations and reduces construction costs

Selective Catalytic Reduction



SCR Experience

B&W SCR systems are installed on nearly 33,000 MW of generating capacity.

Zero Liquid Discharge

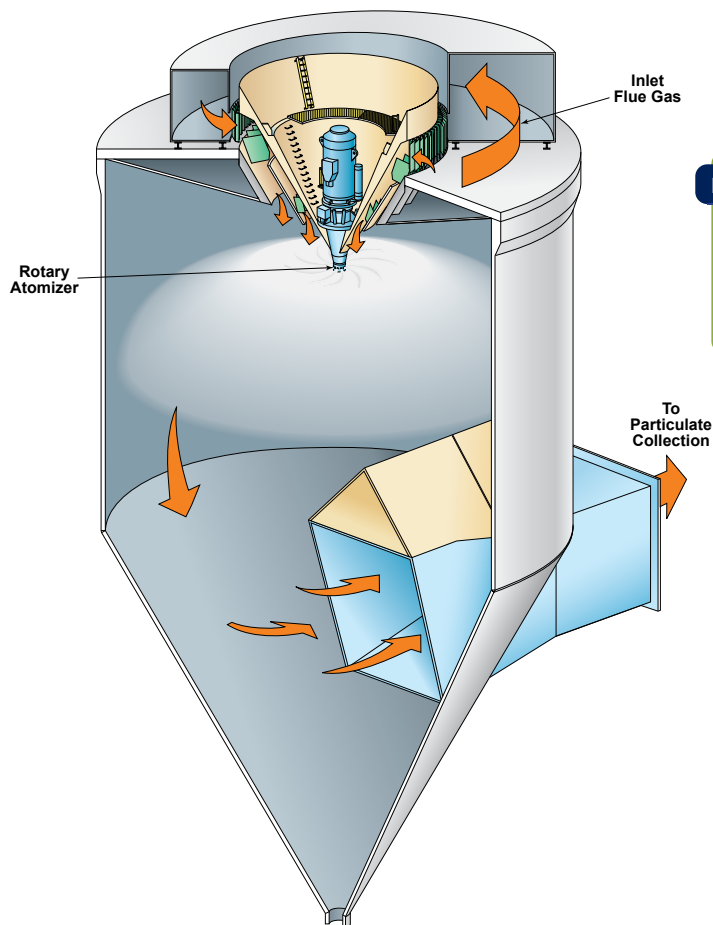
ZLD Spray Dryer

Capabilities/Competencies

- Uses minimal boiler flue gas slipstream to evaporate wastewater
- Results in dry salt product ready for disposal
- Looks and operates like a spray dryer
- Simple, well-understood, equipment
- Minimal boiler efficiency loss
- Carbon steel chamber
- Process engineering and construction expertise

Potential Benefits

- Elimination of wet FGD wastewater discharge
- May allow more time for implementation depending on final re-enactment of postponed Effluent Limitation Guidelines (ELG)
- Uncomplicated process requires limited operator attention while maintaining high reliability
- Option for fabric filter to save fly ash for sale
- Designed for improved material handling



ELG Solution

Designed as an effective zero liquid discharge solution for wet FGD wastewater

Controls and Diagnostic Systems

Capabilities/Competencies

Advanced Performance Technologies

Boiler control systems
Burner management and combustion control systems
Flame Doctor® combustion diagnostic system

Precipitator Controls and Software

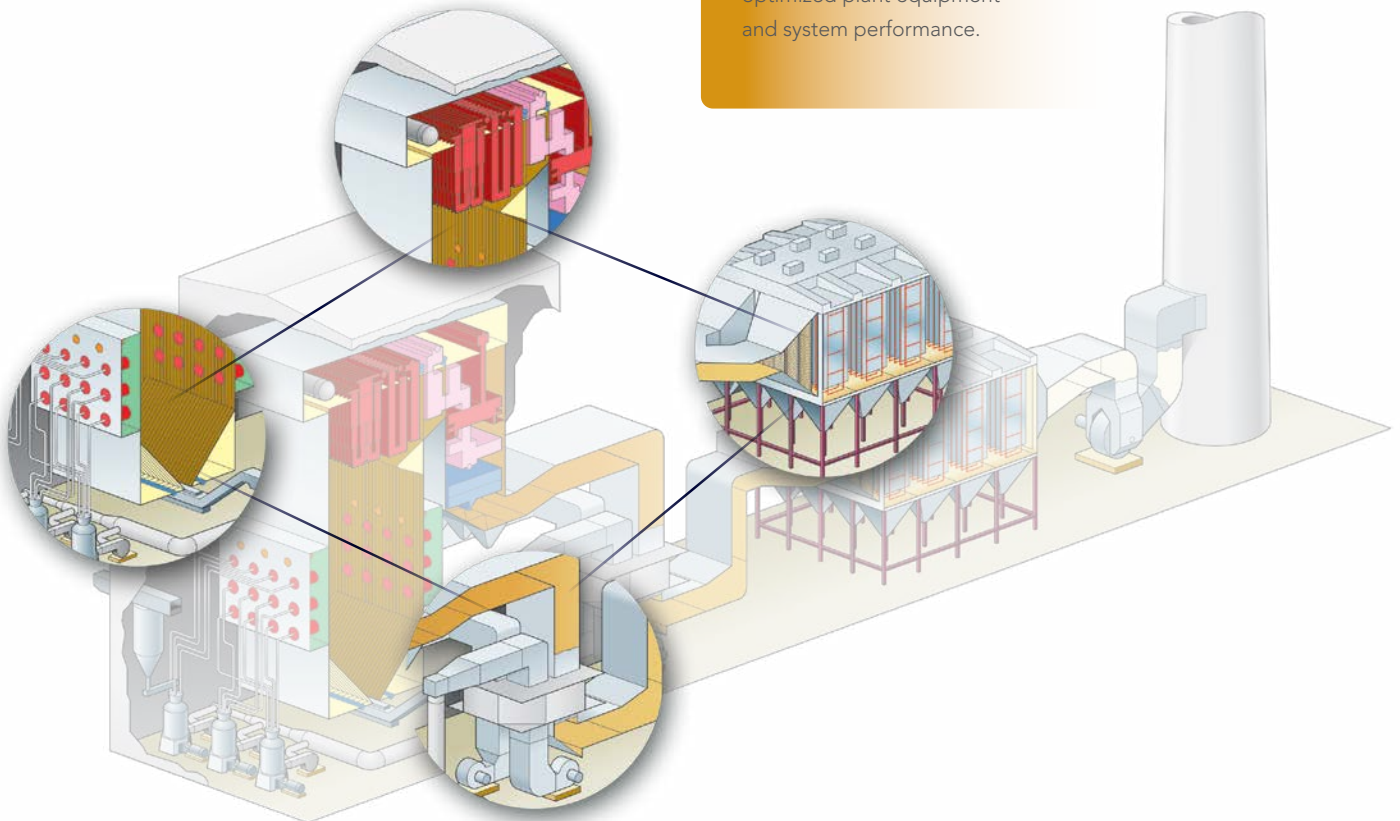
Precipitator Manager™ software
SQ-300®i hybrid automatic voltage control
PRC-100® programmable rapper control
Remote diagnostics

Potential Benefits

MATS compliance solution options
Lower emissions
Improved unit heat rate and system performance
Higher boiler efficiency
Reduced fouling and slagging caused by poor combustion
Reduced auxiliary power consumption
Seamless integration of automated processes
Overall system optimization

Critical System Performance

Integrated control systems for optimized plant equipment and system performance.



Engineering and Field Services

Support after the sale

- Capacity assessment, upgrade and uprate studies
- Circulation and cycling analyses
- Combustion computational flow modeling
- Commissioning and start-up services
- Condition assessment and unit performance studies
- Construction and project management
- Corrosion analysis
- Engineering studies
- Field engineering support
- Plant operation and maintenance
- Technical training

Our People Make the Difference

Rely on B&W's team of field and resident service engineers and service specialists – trusted advisors for your boiler, emissions control system and entire power plant.



Construction

Capabilities/Competencies

- Focus on safety, integrity and ethical business practices
- New construction, plant modifications and retrofits, maintenance and repair
- Design for constructability and modularization
- Extensive experience with large, complex projects
- Flexible contracting methods
- On-time performance with smoother turnover to plant operations

Potential Benefits

- Safely executed projects
- Fully integrated material design and supply optimizes total project costs and schedule and minimizes risks

Target Zero

Finish each and every day injury- and incident-free



Partnering with B&W for your projects means you'll receive the added benefit of working with a supplier who has the breadth of technical expertise and proven capabilities to provide solutions for virtually all boiler designs, manufacturers, auxiliary and environmental systems at a power plant.

We also have the flexibility, responsiveness and agility to provide personalized service and attention to your specific application... before, during and long after the sale.

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LITERATURE

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