Company Overview

Ron Pulliam,
Director, Group Quality
Core Values

Safety is fundamental to B&W

Safe conduct of operations is expected and demanded as we successfully operate in and manage high consequence, high risk work
Creating a Target Zero Culture
Company Profile

**Headquarters:** Charlotte, NC

**Incorporation:** Delaware

**Ownership:** Public (NYSE:BW)

**Revenue:** ~$1.7B

**Chairman & CEO:** E. James Ferland

**Employees:** Approximately 6,000 employees, in addition to 2,500 joint venture employees worldwide

**Strong balance sheet with no debt and backlog of over $2 billion**

- Global leader in energy and environmental technologies and services for the power and industrial markets
- Installed electricity generation capacity of more than 300,000 megawatts in more than 90 countries
- Pioneered environmental equipment in the 1970s with most comprehensive suite of products available
- Ability to service B&W and competitor products
- Employees in 25 countries
The Babcock & Wilcox Company

- Babcock & Wilcox Enterprises, Inc.
- NYSE ticker symbol BW
- $1.6 Billion 2015 Revenue
- $2.6 Billion Backlog
- Approximately 6,000 employees

Global Power

Global Services

Industrial Environmental

- Manufacturing & Operations
- Sales Offices
149 Years of Success in Power Generation

“...the best boiler God has permitted man yet to make.”
Thomas A. Edison (1888)

Steam/its generation and use
- Longest continuously published engineering text of its kind in the world
- Published by B&W since 1875
- Used by power engineers worldwide
- New 42nd edition published in 2015

Leading technology base
- Combustion systems
- Fluid flow systems
- Heat transfer systems
- Emissions control systems
B&W – A Legacy of Innovation

1867 – Building a power boiler reputation
• Original Babcock & Wilcox
• First water-tube power boiler
• Marine boilers for Teddy Roosevelt’s *Great White Fleet*

1947 – Leading the development of nuclear power
• Nuclear components for the *Manhattan Project*
• Reactors for first nuclear-powered submarine, *USS Nautilus*
• First generation U.S. commercial nuclear power plants

1957 – First Supercritical boiler
• 1957 – first initial operation of 306,175 kg/hr; 313.7 bar (675,000 lb/hr; 4550 psig) (AEP Philo)
• 72,200 MW total installed capacity of supercritical boilers
• 107 total SC boilers, base loaded and full-cycling designs, largest in the world

1968 – Addressing the environment
• Fossil fuel emission controls for particulate, SO\textsubscript{x}, NO\textsubscript{x}, Hg
• Development of supercritical coal plants
• Research in fuels, materials, combustion, and post-combustion systems

2005 – Minimizing climate change
• Carbon capture and storage demonstration
• Biomass and solar thermal technologies
• Next-generation commercial nuclear power
Global Power Overview

- Steam generating systems for fossil fuels and renewable energy conversion for power generation and industrial uses
- Environmental solutions include emissions control products and related equipment
- Complex project execution from design through commissioning, offering predictable installation of reliable equipment

2015 Revenue by Segment

- New Build Steam Generation 76%
- Environmental 24%
- New Build International 64%
- U.S. 36%

Utility Steam Generation
Renewable Power
Industrial Power
Environmental Solutions

Pursue Core Growth in International Markets
Global Services Overview

2015 Revenue by Segment

- Aftermarket products and services for steam generating equipment and associated environmental and auxiliary equipment
- Servicing B&W installed electricity generation capacity of approximately 300,000 MW in more than 90 countries plus competitor equipment
- Supports general industry and renewable boilers, including waste-to-energy and pulp & paper
- Extensive network of regionally located service centers, technical support personnel and global sourcing capabilities

Optimize Our Business and Improve Efficiency
Industrial Environmental Overview

- B&W acquired MEGTEC Holdings, Inc. on June 20, 2014
  - 40+ year history with ~600 employees across 12 offices globally
  - Asset-light flexible manufacturing platform
  - Significantly expanded B&W’s industrial environmental capabilities and provides additional channels to market

- Design, engineer, manufacture and service industrial equipment for process industries worldwide
  - Specific technologies for industrial air pollution abatement and recovery
  - Coating and drying equipment for various end markets (including energy storage)
  - Recurring aftermarket business

2015 Revenue by Segment

- Environmental Solutions 49%
- Aftermarket Services 33%
- Engineered Equipment 17%
- Environmental 36% International
- U.S. 64%

$183.7M

Execute a Disciplined Acquisition Program to Drive Growth and Diversification
Environmental Solutions for Industrial Plants

- Wet Electrostatic Precipitator (WESPs)
- Dry Electrostatic Precipitator (DESPs)
- Baghouse/Fabric Filter
- Multicyclone
- Selective Catalytic Reduction (SCR)
- Semi-dry and Wet Scrubbers
- SNCR DeNO$_x$ Systems
- Solvent Recovery Systems
- Distillation & Purification Systems
- Ventilation Air Methane (VAM) to Energy
- Regenerative Thermal Oxidizers (RTOs)
- Catalytic Oxidizers
- Bioscrubbers/Bioreactors
- Greenhouse Gas (GHG) Abatement Technologies
- Heat Recovery Systems
Waste-to-Energy and Biomass

- Leading supplier of energy plants designed to convert household waste and biomass into thermal energy
- Headquarters and workshop in Esbjerg, Denmark
- Branch offices in Copenhagen, Denmark and Gothenburg, Sweden
- Founded in 1898
- 430 employees worldwide

Main business areas include:
  - Waste-to-energy plants
  - Biomass energy plants
  - After sales service
  - Refurbishing/rebuilding
Boiler Cleaning and Ash Handling Solutions

**Integrated solutions**
- Turnkey equipment installation and maintenance
- Diagnostic and Intelligent Control Systems
- Convection Pass, Furnace and Air Heater Cleaning
- Bottom Ash and Fly Ash Handling Systems

**Global manufacturing**
- Lancaster, Ohio
- Diamond Power Machine Hubei (China)
- Diamond Power Specialty Ltd. (Dumbarton, Scotland)
- Straubing, Bavaria, Germany
Material Handling

Overview
- Allen-Sherman-Hoff in material handling business since 1917
- Over 2,000 ash removal systems installed in U.S
- Over 130 ash removal systems installed in 21 countries outside the U.S.
- Manufacturing and assembly facility in Lancaster, OH, USA
- Manufacturing and assembly facility in Wuhan, PRC
- Engineering and operation offices in Exton, PA

Types of Material Conveyed
Coal ash – bottom and fly ash, oil soot, fluidized-bed ash, petroleum coke, pet coke ash, FGD product, lime/limestone, Municipal Solid Waste, Refuse Derived Fuel

Market
- Power plant boilers, fluidized-bed boilers, cogeneration, municipal, incineration, refineries, biomass, bulk materials handling

Systems Experience
- Hydraulic ash handling, pneumatic ash handling, mechanical ash handling, mill rejects handling, oil soot handling, petroleum coke handling, bulk materials handling
Mechanical Conveying and Material Handling

- Loibl Allen-Sherman-Hoff GmbH is located in Straubing, Bavaria (Southern Germany)
- Mechanical conveying and material handling equipment
- Capacity:
  - Company plot 15,000 m²
  - Production area 11,500 m²
  - Open area 3,900 m²

Production Equipment
- NC Lathes
- Plasma flame cutting machine
- Laser cutting machine
- Continuous sand blasting system

Refuse-Derived Fuel (RDF) Handling

FGD Gypsum Conveying Systems

Quarry Transport of Lime/Sandstone
Joint Venture Operations

**Thermax Babcock & Wilcox Energy Solutions (TBWES)**

Established in 2010
- Thermax and B&W ongoing relationship since 1988

Products:
- Sub- and supercritical utility boilers
- Pulverizers

Manufacturing Capacity - 3,000 MW per year
- Facility near Pune, India

Market – India and Export

**Babcock & Wilcox Beijing Company (BWBC)**

Established in 1986

Licensed Products:
- Sub- and supercritical utility boilers
- Industrial and CFB Boilers
- Some environmental equipment (SCR and Low NOx burners)

Manufacturing Capacity – 5,000 MW per year

Markets – China and Export
Business Development/Sales Regions

Walt Nischt
Americas

Willem Roos
Europe/Middle East/Africa

Michael Cherniuk
Asia
Babcock & Wilcox Locations

Key Office & Manufacturing
• Charlotte, NC
• Barberton, OH
• Copley, OH
• Lancaster, OH
• Exton, PA
• De Pere, WI
• Cambridge, Ontario
• Folkston, GA
• Monterrey, Mexico
• Hatfield, PA
• Newport News, VA
• Salt Lake City, UT
• Kansas City, MO

Key Office & Manufacturing
• Esbjerg/Copenhagen, Denmark
• Dumbarton, Scotland
• Straubing, Germany
• Gothenburg, Sweden
• Maintal, Germany

Key Office & Manufacturing
• Beijing, China
• Jingshan, China
• Shanghai, China
• Pune, India
• Jakarta, Indonesia
• Australia, Multiple Locations
Worldwide Manufacturing Facilities

<table>
<thead>
<tr>
<th>Manufacturing Plant</th>
<th>Square Meters</th>
<th>Main Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTBWA-Jakarta, Indonesia</td>
<td>1,755</td>
<td>Power plant maint/services, Trading business (import/export): boilers, machineries, spare parts</td>
</tr>
<tr>
<td>Beijing, China, (Joint Venture)</td>
<td>109,161</td>
<td>Boilers, burners, SCRs</td>
</tr>
<tr>
<td>Cambridge, Ontario</td>
<td>25,362</td>
<td>Boilers, nuclear, pulp &amp; paper</td>
</tr>
<tr>
<td>Pune, India (Joint Venture)</td>
<td>64,939</td>
<td>Boilers, burners, pulverizers</td>
</tr>
<tr>
<td>Monterrey, Mexico</td>
<td>8,919</td>
<td>Pressure parts, Package boilers</td>
</tr>
<tr>
<td>Esbjerg, Denmark</td>
<td>12,449</td>
<td>CHP/WTE boilers</td>
</tr>
<tr>
<td>DPII, Lancaster, OH</td>
<td>42,085</td>
<td>Boiler cleaning equipment</td>
</tr>
<tr>
<td>Copley, OH (Service Center)</td>
<td>12,077</td>
<td>Wear parts, pulverizer rebuilds</td>
</tr>
<tr>
<td>Exton, PA</td>
<td></td>
<td>Material handling equipment</td>
</tr>
<tr>
<td>Kansas City, MO</td>
<td></td>
<td>Wear parts, tubes, pulverizer rebuilds</td>
</tr>
</tbody>
</table>

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<tr>
<th>Manufacturing Plant</th>
<th>Square Meters</th>
<th>Main Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>DPII, Dumbarton, Scotland</td>
<td>9,476</td>
<td>Boiler cleaning equipment</td>
</tr>
<tr>
<td>DPII, Hubei, China</td>
<td>23,133</td>
<td>Boiler cleaning equipment</td>
</tr>
<tr>
<td>Loibl A-S-H, Straubing, Germany</td>
<td>3,502</td>
<td>Material handling equipment</td>
</tr>
<tr>
<td>KVB-Enertec, Hatfield, PA</td>
<td>279</td>
<td>Emissions monitoring</td>
</tr>
<tr>
<td>Folkston, GA</td>
<td>10,219</td>
<td>Precipitator components, mechanical</td>
</tr>
<tr>
<td>Newport News, VA</td>
<td>464</td>
<td>Precipitator components, electrical</td>
</tr>
<tr>
<td>De Pere, WI (MEGTEC)</td>
<td>23,225</td>
<td>Industrial emissions control equipment</td>
</tr>
<tr>
<td>Shanghai, China (MEGTEC)</td>
<td>4,255</td>
<td>Industrial emissions control equipment</td>
</tr>
<tr>
<td>Pune, India (MEGTEC)</td>
<td>836</td>
<td>Industrial emissions control equipment</td>
</tr>
<tr>
<td>Salt Lake City, UT</td>
<td>4,571</td>
<td>Wear parts, tubes, pulverizer rebuilds</td>
</tr>
</tbody>
</table>

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Advanced Technology Portfolio
Enhancing and Adapting for Global Markets

Steam Generators
- Highest efficiency coal-fired design
- Base-loaded, full-cycling
- Largest supercritical boilers in world
- Spiral & vertical tube PC & CFB boilers
- State-of-art metallurgy & beyond

Environmental
- NO\textsubscript{X} reduction
- SO\textsubscript{2} control
- Particulate control
- Acid gas reduction
- Mercury removal
- Ash management

Renewables
- Biomass
- Waste-to-Energy for RDF & MSW
- Grate, BFB & CFB boilers

Ultra-Supercritical Boiler
Total Environmental Solutions for Utility & Industrial
Copenhill – Amager Bakke
Waste-to-Energy plant in Denmark
Steam Generator and Environmental Technology Solutions – New & Retrofit

Product & Services

- Boilers
- Environmental (FGT)
- Field Services
- Construction (N.A.)
- O&M Services
- Boiler Cleaning
- Ash Handling
- O&M Enhancements
Environmental Technology Portfolio

Providing Customized Environmental Solutions

- Spray Dryer Absorber
- Wet FGD
- Circulating Dry Scrubber
- Industrial and WtE Scrubbers
- Fabric Filter
- Dry ESP
- Wet ESP / SO$_3$ Control
- Multiclone® Dust Collector
- Mercury Control
- Acid Gas Dry Sorbent Injection
- CO$_2$ Control
- SCR / Low NO$_x$ Burner
- Emissions Monitoring
- Parts, Upgrades and Rebuilds
- Ash Management
Steam Generation Technology Portfolio

An Extensive Array of Technologies

- Ultra-Supercritical Utility Boilers
- Subcritical Utility Boilers
- CFB Boilers and WtE
- BFB Boilers and WtE
- Recovery Boilers
- Grate-Fired Refuse Boilers
- HRSG Boilers
- Package Boilers
- Multi-Fuel Industrial Boilers
- Sootblowers Ash & Material Handling
Utility Power Steam Generators
Subcritical & Supercritical Pressure

- **Pulverized Coal**
  - ~100 MW to 1300 MW

- **Circulating Fluidized-Bed**
  - ~50 MW to 660 MW

- **Heavy Fuel Oil**
  - ~100 MW to 800 MW

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B&W Supercritical Boiler Technology

- 99,000+ MW Total Capacity
- 1st Ultra-supercritical (314 bar) unit, 1957
- Largest supercritical boilers in the world (9 x 1,300 MW)

- Total Supercritical Boilers – 148
- Base-loaded and Full-cycling designs
- Variable Pressure Designs – 40% of units

- Bituminous
  - 60,000+ MW

- Oil & Gas
  - 18,000+ MW

- Sub-Bit, Lignite
  - 13,500+ MW

- Anthracite
  - 6,800+ MW
Biomass Technology Portfolio

Circulating Fluidized-Bed (CFB)

Bubbling Fluidized-Bed (BFB)

Stoker/Grate-Fired Boilers
Industrial Gas/Oil-Fired Boilers and HRSGs
New and Retrofit
DeNO$_x$ Systems

- Selective Catalytic Reduction
- Selective Non-Catalytic Reduction
- Low NO$_x$ Burners – PC & HFO
## Flue Gas Treatment Systems – DeSO\textsubscript{X}

<table>
<thead>
<tr>
<th>System</th>
<th>Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spray Dry FGD System</td>
<td>- Up to 98% SO\textsubscript{2} removal&lt;br&gt;- Lower sulfur fuels&lt;br&gt;- Traditionally &lt;1.5% sulfur coal, but with hydrated lime, virtually unlimited&lt;br&gt;- Dry product for landfill, Uses lime</td>
</tr>
<tr>
<td>Wet FGD</td>
<td>- Up to 98+% SO\textsubscript{2} removal&lt;br&gt;- High sulfur fuels (&gt;1.5%)&lt;br&gt;- More fuel flexibility&lt;br&gt;- Marketable byproduct&lt;br&gt;- Typically uses limestone</td>
</tr>
<tr>
<td>Dry Sorbent Injection</td>
<td>- Usually lime or sodium based&lt;br&gt;- Injected before particulate control device&lt;br&gt;- Used for SO\textsubscript{2}, SO\textsubscript{3}, HCl control</td>
</tr>
<tr>
<td>Circulating Dry Scrubber</td>
<td>- Up to 98+% SO\textsubscript{2} removal&lt;br&gt;- Higher sulfur fuels (&gt;1.5%)&lt;br&gt;- More fuel flexibility&lt;br&gt;- Dry product for landfill&lt;br&gt;- Uses lime which is hydrated on-site</td>
</tr>
<tr>
<td>Seawater Scrubber</td>
<td>- International applications&lt;br&gt;- Uses warm seawater&lt;br&gt;- No byproduct</td>
</tr>
</tbody>
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Particulate Control

**Pulse Jet**
- Workhorse of utility industry
- Low O&M cost
- Can provide >99.5% collection efficiency

**Fabric Filter**
- Emissions <10mg/Nm³
- Acts as secondary scrubber with sorbent injection
- Installed >99% after SDA or CDS
- Can be used in series with ESP for Hg control

**Wet ESP**
- Final filter after Wet FGD
- Collects residual solids carryover, $SO_3/H_2SO_4$
- One solution to blue plume
- Usually for high sulfur fuel
- Minimizes condensable emissions

**Dry ESP**
- Workhorse of utility industry
- Low O&M cost
- Can provide >99.5% collection efficiency
Serving the Operating Fleet from Chute to Stack

Service Projects
Maximizing the Capability of Your Equipment

Field Service
Trusted Advisors for Reliable Operation

Replacement Parts
Delivering Quality Parts, Programs & Services

Boiler Cleaning Solutions
Intelligent Control Solutions
# B&W Environmental Aftermarket Services

## Product and Service Offerings

<table>
<thead>
<tr>
<th>Wet FGD</th>
<th>Dry FGD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upgrades, rebuilds of existing 85,000 MW, replacement parts</td>
<td>Upgrades, rebuilds (of existing 12,000 MW), Niro atomizer and system parts</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dry ESPs</th>
<th>Fabric Filters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rebuilds, service, inspections and parts</td>
<td>ESP to FF conversions; replacement bags and parts</td>
</tr>
</tbody>
</table>

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<tr>
<th>SO₂ or SO₃ Control</th>
<th>Mercury Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trona and lime injection systems</td>
<td>Wet FGD re-emission additive, Fuel additive for PRB units and PAC</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SCR and SNCR</th>
<th>Wet ESPs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuning services, catalyst management and regeneration, DeNOₓ systems</td>
<td>Parts and upgrades for existing units</td>
</tr>
</tbody>
</table>

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<tr>
<th>Field Specialists</th>
<th>Remote Consulting</th>
</tr>
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<tbody>
<tr>
<td>Support and train O&amp;M personnel, inspections, troubleshooting</td>
<td>Support for troubleshooting, O&amp;M, process performance, “over the phone”</td>
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</tbody>
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<tr>
<th>Resident Service Engineers</th>
<th>Emissions Monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>RSE programs together with B&amp;W FES</td>
<td>CEMS including field service/support and replacement parts, DAHS software and remote monitoring and diagnostic services</td>
</tr>
</tbody>
</table>