



# The Babcock & Wilcox Company

Generating Powerful Solutions<sup>SM</sup>

a McDermott company

## Project Case History

### ***B&W's Open-Bottom Bubbling Fluidized-Bed Technology Designed for Biomass Firing***

*Biomass unit meets and exceeds all owner and operator expectations.*

#### **Background:**

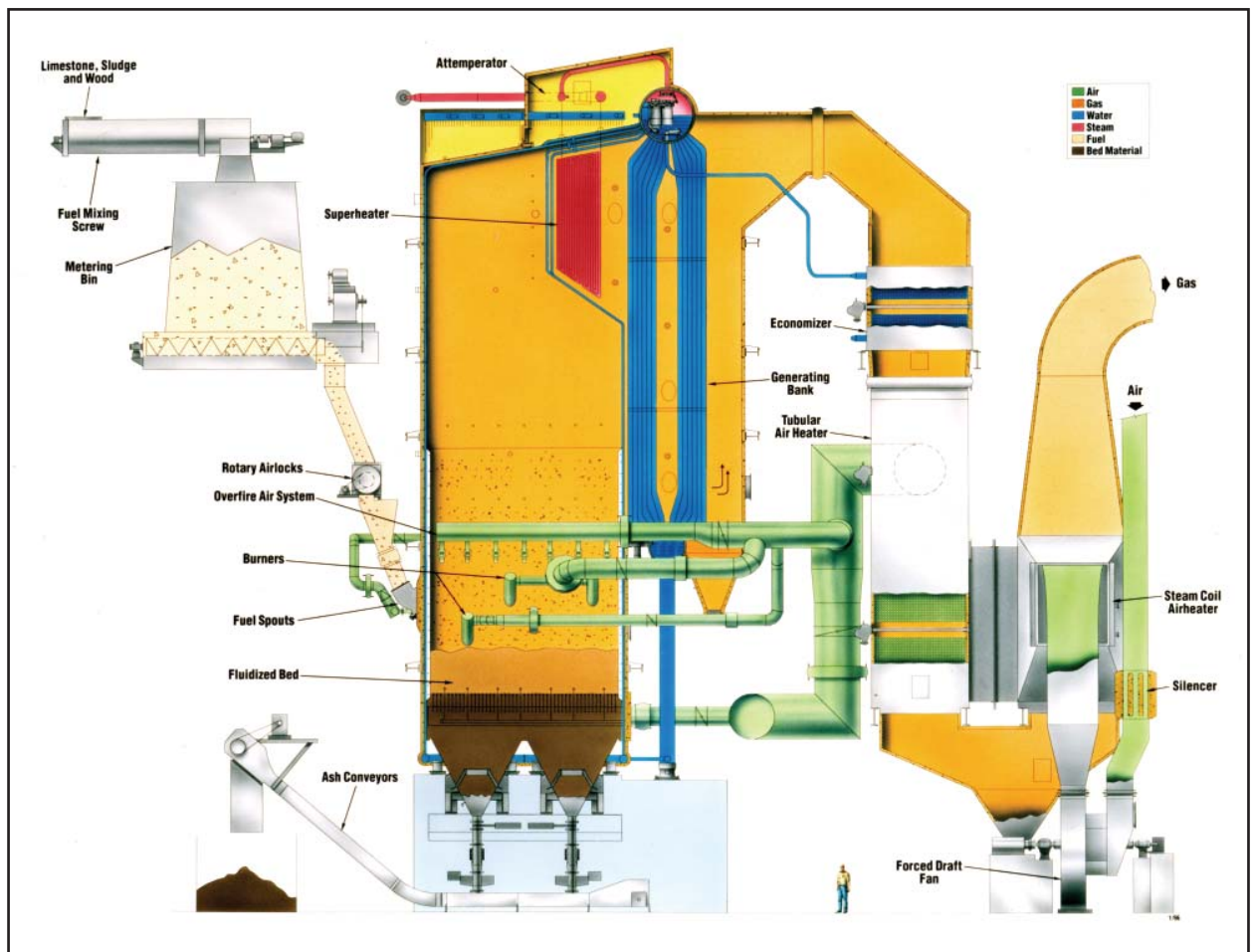
Mill owners in Oregon approached The Babcock & Wilcox Company (B&W) with multiple goals:

- Burn low cost, mill-generated biomass (bark)

- Dispose of 100% of the mill's sludge, landfilled at the time
- Produce additional steam that could be fed into the existing plant steam system
- Use steam to generate electricity
- Meet all strict emissions re-

quirements mandated by the Oregon Department of Environmental Quality

Fluidized-bed combustion has been successfully applied to a range of wood and biomass fuels



***B&W's open-bottom BFB design allows the removal of non-combustible material from the furnace while the boiler is operating.***

and offers a number of features that may be advantageous in specific applications.

### **Solution:**

Bubbling fluidized-bed (BFB) systems are attractive when wide fuel flexibility is required, and for firing high moisture and lower heating value fuels. B&W's solution – an open-bottom bubbling fluidized-bed unit, was the first such B&W design in North America.

The unit features an open-bottom design to eliminate concerns about rocks and other debris typically found in bark and woody biomass. Non-combustible material is easily removed from the furnace with the boiler in operation. Bed temperature is controlled to limit emissions of NO<sub>x</sub> and to limit bed material agglomeration. The controlled burning within the bubbling bed helps control the combustion temperature, providing better control of emissions levels over a range of changing fuel conditions. Also, a flue gas recirculation system allows operation of the boiler over an even wider range of fuel moistures.

The unit is now burning all of the mill's sludge and is operating successfully at 25% above the



***This BFB unit is now burning 100% of the sludge produced at the mill and is operating 25% above the original rated capacity.***

original rated capacity. In addition, the sludge is supplemented with low-grade, high-moisture bark, in plentiful supply at the mill.

### **Further Benefits:**

- To reduce construction time and impact on other mill operations, the boiler was ground-assembled in two major sub-assemblies, then lifted into place on successive days. The mill continued to run at full capacity throughout boiler installation.
- The additional steam has allowed the mill to reduce its former reliance on a natural-gas-fired unit, thereby greatly reducing fuel costs, and fuel price uncertainty.
- No emissions scrubber was required on this unit, due to its low-emissions design.
- Landfill cost of sludge disposal was virtually eliminated.



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**The Babcock & Wilcox Company**  
20 S. Van Buren Avenue  
Barberton, Ohio, USA 44203  
Phone: (330) 753-4511 • Fax: (330) 860-1886

**Babcock & Wilcox Canada Ltd.**  
581 Coronation Boulevard  
Cambridge, Ontario, Canada N1R 5V3  
Phone: (519) 621-2130 • Fax: (519) 621-9681