

University of Alaska Fairbanks Combined Heat and Power Plant

PROJECT CASE HISTORY

Babcock & Wilcox (B&W) designed and manufactured an internal recirculation circulating fluidized-bed (CFB) boiler and air quality control equipment for a new combined heat and power (CHP) plant for the University of Alaska Fairbanks (UAF).

Plant Name

University of Alaska Fairbanks

Location

Fairbanks, Alaska

B&W Scope

Steam supply

- Circulating fluidized-bed (CFB) boiler
- Power island building structural steel
- Coal silos
- Feeders and chutes

Air quality control equipment supply

- Limestone injection
- Dry sorbent injection
- Multiclone® dust collector
- Pulse jet fabric filter

Other

- Allen-Sherman-Hoff® bottom and fly ash handling systems
- Material transport systems
- B&W SPIG air-cooled condensers

Boiler Specifications

Capacity: 17 MW

Steam flow: 240,000 lb/hr (30.24 kg/s) steam

Steam pressure: 740 psig (5.1 MPa)

Steam temperature: 750F (399C)

Fuel: Alaskan subbituminous coal; flexibility to fire up to 15% biomass



Project Facts and Results

Boiler hydrostatic testing: October 2017

Construction completion: Fall 2018

First natural gas fire: Fall 2018

First coal fire: end of 2018

Boiler tuning: Fall 2019

UAF replaced the existing boilers originally built in 1964. The replacement CFB boiler will meet current power and steam demands as well as future growth requirements of the university.

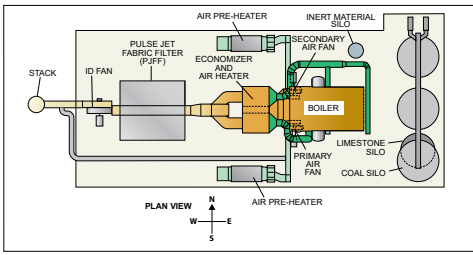
The electricity and low-pressure steam generated will power and provide heating and chilled water to the university's numerous buildings, classrooms, research facilities, and student housing located on approximately 3 million ft² (nearly 69 acres, or 28 hectares) of campus property.

The sub-arctic climate in Fairbanks created unique scheduling challenges as steel construction was required to stop when temperatures dropped below -15F (-26C), and all work stopped at temperatures of -30F (-34C).

Shipping and logistics were challenging due to the location of Fairbanks (360 miles [579 km]) from the port city of Anchorage.

Emissions results indicate the unit is capable of meeting nitrogen oxides (NO_x), sulfur dioxide (SO₂), and particulate emissions permit limits throughout its load range.

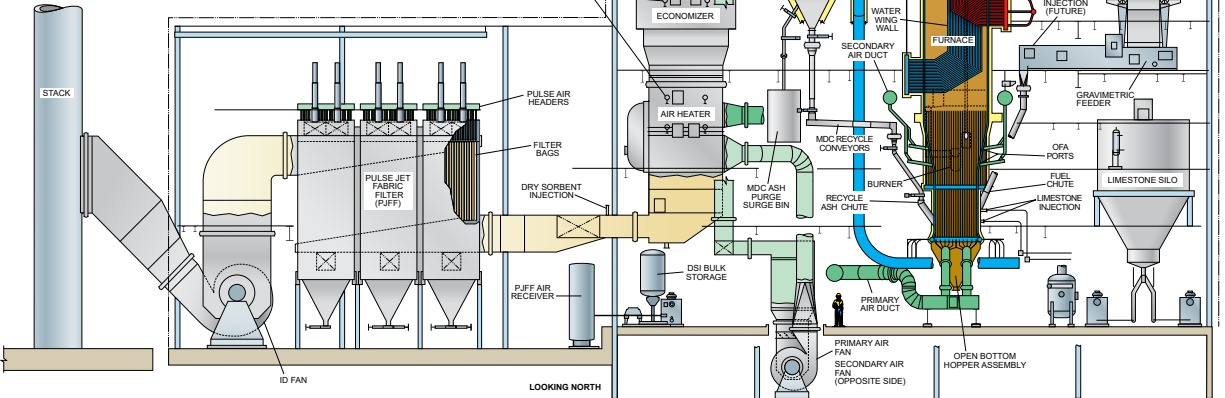
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**UNIVERSITY OF ALASKA FAIRBANKS
COMBINED HEAT and POWER PLANT**

Babcock & Wilcox Circulating Fluidized-Bed Boiler

Steam Flow 240,000 lb/hr (30.24 kg/s)
 Steam Pressure 740 psig (5.1 MPa)
 Steam Temperature 750F (399C)



B&W's internal recirculation CFB boiler provides power plant owners with economy, reliability and flexibility. Our design employs a two-stage particle separation system to provide high-solids loading and a uniform furnace temperature profile. Additional features include reduced refractory (and thus, reduced maintenance), reduced tube erosion, and fuel and sorbent flexibility.

The benefits of this technology include superior combustion efficiency, low emissions, low maintenance, low pressure drop, and high turndown, resulting in improved overall plant performance.

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