

# Alunorte CFB Steam Generator

Plant Case History

## Alumina do Norte do Brasil S.A.

Barcarena, Para, Brazil

This project was supplied by HPB Engenharia e Equipamentos Ltda. (HPB), a licensee of Babcock & Wilcox (B&W).

### HPB Scope of Supply

Coal-fired internal recirculation circulating fluidized-bed (IR-CFB) boiler including:

- Structural steel
- Fans and motors
- Tubular air heaters
- Economizer
- Multi-cyclone dust collector (MDC)
- Ash recycle/reinjection system
- Limestone injection system
- Limestone silo
- Startup burners
- Refractory lined lower furnace with erosion protection at the Reduced Diameter Zone (RDZ) transition
- Fluid bed ash coolers
- Bed drain system including screws, screeners, crushers, belt conveyor and bucket elevators
- Multi-cyclone dust collector screws
- Flues and ducts
- Segmented U-beam primary particle collectors with water-cooled support system
- Coal feeders and bunkers
- Blowdown tanks
- Instrumentation and controls

### Environmental Equipment

- Pulse jet fabric filter

### Boiler Specifications

- Boiler type: Internal Recirculation CFB design
- Design fuel: Bituminous coal
- Startup fuel: Light (diesel) oil
- Capacity: 256 MW<sub>t</sub>
- Steam flow: 750,000 lb/h (94.5 kg/s)
- Steam pressure: 1536 psig (10.6 MPa)
- Steam temperature: 925F (496C)

### Contract Order

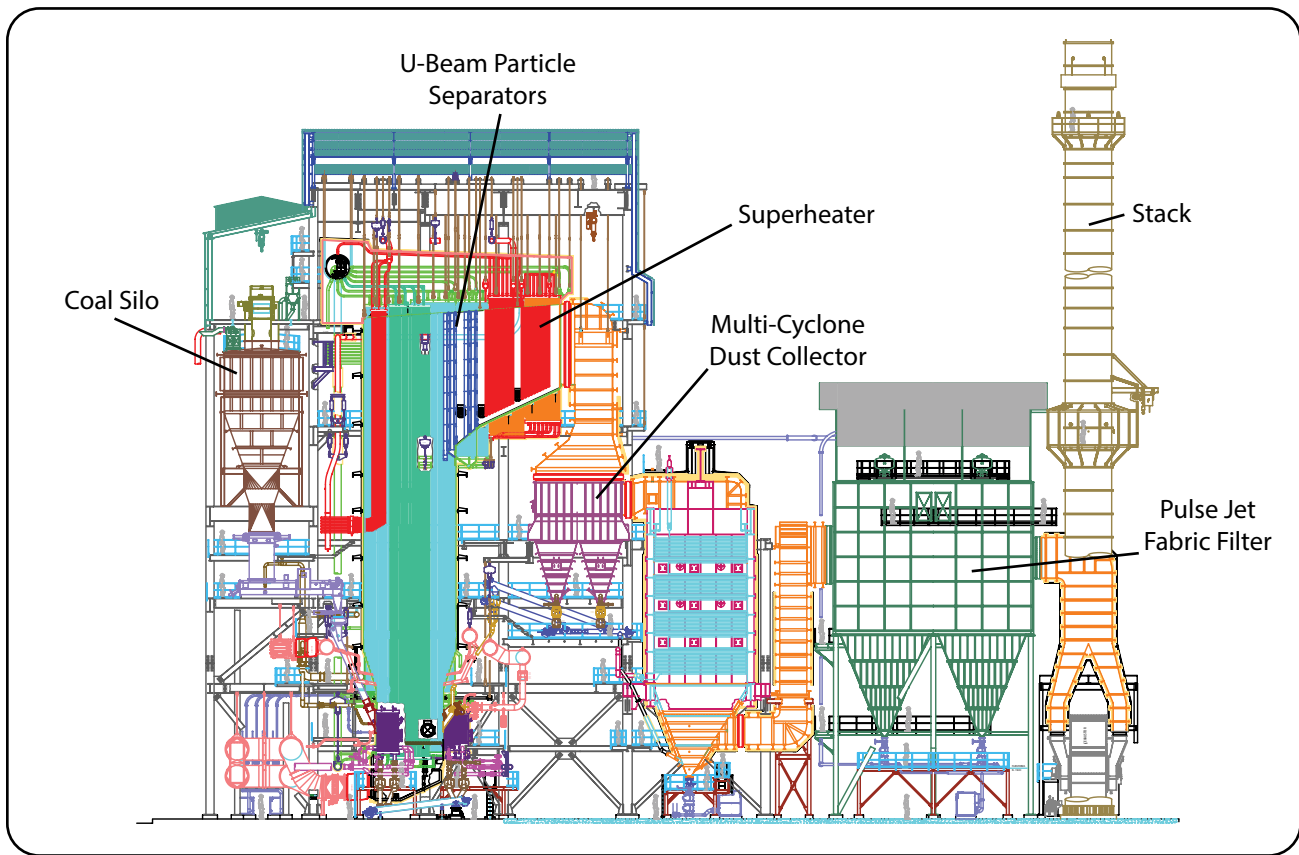
2006

### Commercial Operation

2008



(Continued on reverse side)



Side view of the Alunorte CFB steam generator and pulse jet fabric filter.

### Project/Boiler Facts

- The steam produced by the CFB boiler, in conjunction with the existing steam generation units, will fulfill the needs of the alumina production process in a safe, reliable and efficient manner.
- The addition of limestone to the circulating bed reduces sulfur dioxide (SO<sub>2</sub>) emissions from the boiler.
- Low furnace temperatures and staged combustion limit nitrogen oxides (NO<sub>x</sub>) emissions.
- Unique two-stage solids collection system using U-beams and MDC provides superior collection efficiency. The recycling of solids collected by the MDC improves combustion efficiency and limestone utilization.
- The U-beam and MDC solids collection system requires significantly less maintenance than hot cyclones.
- RDZ design with silicon carbide tiles at the top edge of the furnace refractory is used to minimize tube erosion at the interface.

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