

TransAlta Centralia WFGD Retrofit

QUICK FACTS

(Numbers below are based on Contract Guarantee Case Basis)

Contract Cost - \$151,321,555

Compliance Unit #2 by 12/31/01 and Unit #1 by 12/31/02

Plant Totals for 2 Units

Limestone Consumption 656 tons per day

Gypsum Production 1,198 tons per day



Limestone Ball - One Installed Total for both units
Horizontal Mill 12.5 ft by 24 ft, 2,000 horsepower

Process Basis Per One Unit

Sulfur at 1.05% per Unit

70% Centralia Coal and 30% Imported Coal

Unit Power Generated 700 Megawatts

Fuel Higher Heating Value 7,842 BTU per lb.

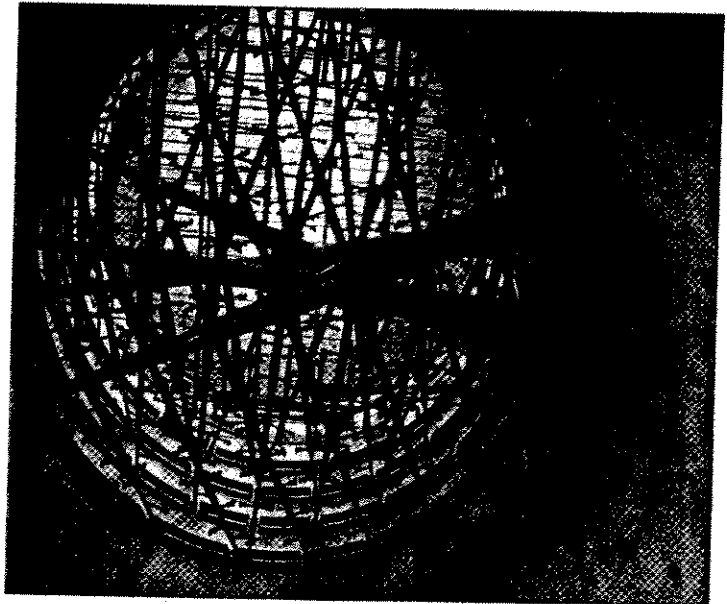
Calculated Furnace Heat Input 7,015,000 BTU per hr.

Specified SO₂ Emission 1,580 lbs. per hour

SO₂ into Scrubber 17,558 lbs. per hour

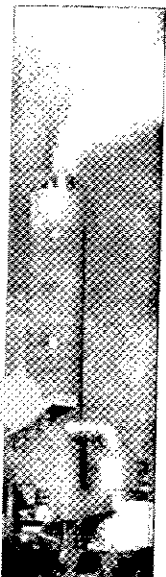
SO₂ Removal Rate in Absorber 90%

SO₂ Removed 15,924 lbs. per hour

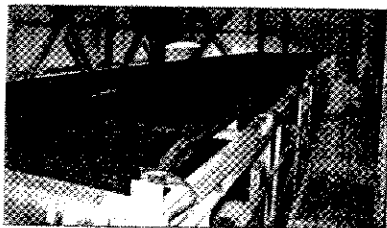


Inside of the Absorber looking up at spray headers and nozzles.

- There are two Absorber vessels made of stainless steel.
- They are each 58.5 ft in diameter and 121.45 ft. in height.
- There are four spray levels per absorber.



- New stack is 70 ft in diameter and 470 ft high, stainless steel clad liners are 29 ft in diameter
- 8 Slurry Pumps total at 55,000 gallons per minute recycle each



- 2 Belt Filters at 46 tons per hour each

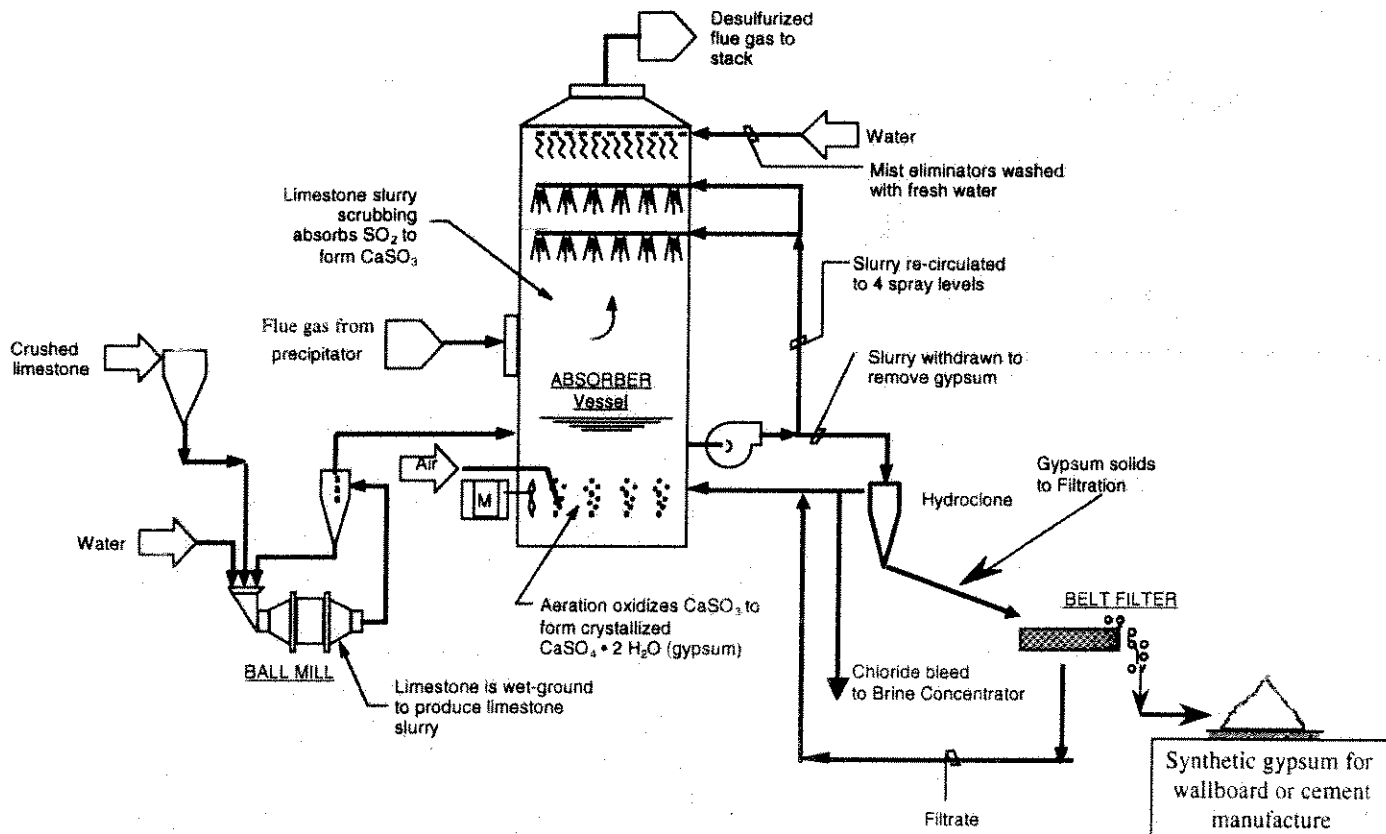
TransAlta WFGD - Centralia Unit 1 & 2

Vocabulary

- WFGD - Wet Flue Gas Desulfurization
- LSFO - Limestone Forced Oxidation
- SO_2 - Sulfur Dioxide
- CaCO_3 - Calcium Carbonate (Limestone)
- $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ - Calcium Sulfate (Gypsum)



Limestone Forced Oxidation Process Diagram



Introduction to Wet FGD Technology

Flue gas containing SO_2 contacts alkaline (limestone) aqueous slurry in an absorber. In the absorber, SO_2 dissolves in the slurry and initiates a reaction with dissolved limestone. As a result of this reaction, calcium sulfite crystallization occurs in the reaction tank, and available alkalinity of the slurry is depleted. Fresh limestone slurry is added to the reaction tank to maintain the desired alkalinity. Forced oxidation is added to the reaction tank to convert calcium sulfite into calcium sulfate (gypsum). The reaction tank slurry is recycled through the spray nozzles until the desired density of the slurry is obtained. Classifier pumps then remove some of the reaction tank slurry to be dewatered and filtered. The by-product is gypsum.