How a wet scrubber works

Scrubbers or flue gas desulfurization (FGD) systems use chemical and mechanical processes to remove sulfur dioxide (SO2) from gas produced by burning coal.

Exhaust gas from a coal-fired unit’s steam generator is routed through absorber vessels where chemical reactions take place, and SO2 is removed. The illustration below depicts a limestone forced oxidation FGD system.

- In the absorbers flue gas passes through a mixture or slurry of pulverized limestone and water, which is sprayed into the flue gas stream.
- SO2 reacts with the slurry and forms calcium sulfate or gypsum, which is managed in a landfill or used to produce drywall.

What is SO2?

Sulfur dioxide is a gas that forms when the sulfur in coal is burned. Sulfur dioxide (SO2) dissolves easily in water and, when limestone is present, forms calcium sulfate or gypsum. SO2 is a precursor of acidic deposition (acid rain) associated with the acidification of soils, lakes and streams.

Why is AEP installing scrubbers?

FGD systems will help AEP improve the environmental performance of its power plants. AEP’s FGD system investments will enable the company to comply with phase one of the new Clean Air Interstate Rule. AEP continuously evaluates alternatives for meeting such requirements. After extensive study, AEP determined that installing FGD (scrubber) systems at certain carefully selected power plants is the best option for all stakeholders, cost-effectively providing maximum environmental benefits.

How efficient are FGD systems?

Current wet scrubber technology can consistently achieve 95% removal of SO2 from flue gas.

Do scrubbers remove other coal combustion gases?

Yes. Recent studies indicate that wet scrubbers remove some of the oxidized mercury from the gas stream.

Other information

- Power plants have cut SO2 emissions by more than one third of 1980 levels (the reference year cited in the 1990 Clean Air Act amendments), according to EPRI. AEP cut its SO2 emissions by some 44% between 1990 and 2001 while coal-fired generation increased by 10%.

- An FGD system neither uses nor produces harmful chemicals, but it does produce a significant amount of a solid waste product. This product is gypsum, which can be used in drywall or it can be safely managed in a landfill.

- Current scrubber technologies also increase the amount of water vapor emitted through the stack. This alters the physical characteristics of the plume, which is billowy white water vapor.