

Beaumont Environmental Systems

ESP Used With RAP/DAP

We can continue to use an Electrostatic Precipitator while reducing contaminates from the boiler system.

Continuing to use the ESP will depend on the MACT or operating permit requirements that apply to the boiler.

It is better to replace the ESP with a fabric filter when SO₂ reduction is required –or- if the PM outlet requirements are less than 0.05 lbs/mmbtu's. Conventional fabric filters are good down to about 0.03 lbs/mmbtu's. Low sulfur removals may still consider retaining the ESP.

Assuming the precipitator is appropriate we need to pre-condition the flue gas if we wish to control any of the following:

- **H₂SO₄** Cooling and Stabilization Lime addition
- **HCl** Cooling with Lime Slurry and small Recycle
- **Hg** Cooling and Stabilization Lime Addition for Bituminous
- **Hg** Cooling, Lime Addition and SO₃ Upstream Conditioning for Sub-bituminous/PRB coals
- **Metals** Cooling
- **Other Condensibles** Cooling

Typically we will cool to 250 F (BES patented Process) to condition the gases (Cooling/Condensing). Where appropriate we add lime.

It is better to incorporate a recycle system and add the lime as a Ca(OH)₂ slurry. The larger the recycle system, the better the evaporation and the lower the moisture content of the particulate material entering the precipitator. With less moisture there will be less corrosion potential.

With a larger recycle system, there will be a larger inlet load due to the recycled material, perhaps 15 to 40 grains at the ESP inlet.

With lime addition (or recycle), the grain loading increases, which is a negative impact on precipitator performance but with gas cooling the gas velocity and particle resistivity will decrease. The water addition will increase ion mobility and the reactor turbulence will increase particle size by agglomeration. Overall ESP performance should improve.

The addition of the cooler (RAP) will increase the pressure drop by 5 to 6 inches.