

Enhancement of the “Naturally Occurring” Mercury Capture by Fly Ash

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Many utilities are actively seeking effective and inexpensive technologies for controlling multiple pollutants including mercury emitted from power plants. GE Energy has been developing an integrated multi-pollutant control approach for coal-fired power plants since the late 1990s. The approach enhances the “naturally occurring” mercury capture by fly ash through combustion optimization and increasing carbon in ash content and may include a polishing step that uses small amounts of activated carbon to further increase mercury removal efficiency. Other benefits of the approach include reduced NO_x emissions, improved boiler performance, increased heat efficiency, and minimized CO emissions as a result of combustion optimization. The approach can be tailored to specific unit configurations and coal types for optimal performance.

Fly ash with the absorbed mercury can be landfilled or optionally treated in an ash burnout unit to recover heat and generate salable fly ash. Carbon bed can be used to absorb mercury released from fly ash in the burnout unit. Mercury absorption in carbon bed can be done more economically than in the boiler.

Short-term demonstration of the ability of fly ash to removal mercury was conducted in 250 MWe unit firing a bituminous coal. Coal reburning was used to increase carbon in ash content. Testing demonstrated that without the reburning system in operation, mercury emissions were reduced by approximately 40% at the ESP outlet. At optimized reburning conditions mercury removal was 80%.

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For view graphs, see www.netl.doe.gov, Events, 2005 Conference on Unburned Carbon on Utility Fly Ash, April 2005