

Transforming Bottom Ash into Fly Ash at Coal Fired Power Stations

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ABSTRACT

The article describes the operational experience of the first installation of the Magaldi Ash Recycling (MAR) system. The system was installed at a 2x320 MW PC fired power plant in Fiume Santo (E.ON.). The MAR system is a recycling process that transforms bottom ash to fly ash by returning the dry bottom ash to the boiler combustion chamber.

Bottom ash is removed from beneath the boiler using a MAC[®] (Magaldi Ash Cooler) System. This system extracts and cools the bottom ash, and then the ash is conveyed back to the coal feeders, where it is mixed with the coal, milled and reintroduced into the furnace. The MAC[®] system is a proven technology with more than 100 installations worldwide, on boilers generating more than 35,000 MW.

The effects of reinjection of bottom ash will be discussed including the results of the analysis. The benefits of the MAR system for the study power station are remarkable, and can be summarized by the following achievements:

- Conversion of all bottom ash into saleable fly ash
- Complete elimination of costs associated with bottom ash disposal
- Unburned carbon content reduction in fly ash due to dilution effect
- Fly ash in compliance with international standards. In UE these are UNI-EN 197-1:2006 for cement and UNI-EN 450-1:2005 for concrete (UBC ≤ 5% and fineness ≤ 40% as oversized particles on a sieve hole diameter of 45 μm)
- Environmental benefits occur from mixing fly ash with cement, thereby reducing the production of cement and leading to a decrease in CO₂ emissions that would have been produced without using fly ash as a filler (approximate reduction of 0.9 tons of CO₂ for each ton of fly ash used)

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