

Field Testing of a Wet FGD Additive for Enhanced Mercury Control

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This project is being conducted as part of NETL Cooperative Agreement DE-FC26-04NT42309, "Field Testing of a Wet FGD Additive." The objective of the project is to demonstrate the use of flue gas desulfurization (FGD) additives to prevent the re-emissions of elemental mercury (Hg^0) in flue gas exiting wet FGD systems on coal-fired boilers. Furthermore, the project has attempted to demonstrate whether such additives can be used to precipitate most of the mercury (Hg) removed in the wet FGD system as a fine salt that can be separated from the FGD liquor and bulk solid byproducts for separate disposal. Pilot- and full-scale additive tests have been conducted in wet FGD absorbers for three coal types: Texas lignite/Power River Basin (PRB) coal blend, high-sulfur Eastern bituminous coal, and low-sulfur Eastern bituminous coal.

The project team consists of URS Group, Inc. as the prime contractor, EPRI, Luminant Power (was TXU Generation Company LP), the Southern Company, AES, Degussa Corporation and the Nalco Company. EPRI has provided technical input and co-funding. Luminant Power has provided the Texas lignite/PRB co-fired test site for pilot FGD tests, Monticello Steam Electric Station Unit 3, and provided EPRI tailored collaboration project co-funding. Southern Company provided the low-sulfur Eastern bituminous coal host site for wet scrubbing tests, as well as the pilot- and full-scale jet bubbling reactor (JBR) FGD systems tested. They also provided on-site test support and management, and project co-funding through a tailored collaboration project with EPRI. AES' Indianapolis Power and Light Company provided project co-funding and a high-sulfur Eastern bituminous coal full-scale FGD test site, at their Petersburg Station Unit 2. Finally, Degussa Corporation and the Nalco Company are providing additives and technical support to the test program.

This presentation will include project results from the time period December 2006 (the most recent, previous DOE contractors' meeting) to December 2007. Over this time period, two full-scale FGD additive tests were conducted at Georgia Power's Plant Yates. The first test involved the addition of Degussa's additive TMT-15 over a period of 15 days, while the second test involved a 30-day test of a proprietary additive from Nalco. During these tests, speciated mercury removal was measured across the FGD absorber using a mercury semi-continuous emission monitor (SCEM) at the JBR inlet and a continuous mercury CEM at the JBR outlet stack. Also, the Ontario Hydro method was used to confirm SCEM/CEM data for FGD inlet and outlet mercury concentrations, speciation and re-emission levels. These data will be presented and discussed.

Other results presented will include the results of beaker tests conducted at IP&L's Petersburg Station which show the effects of TMT-15 dosage on resulting mercury concentrations in the FGD liquor. These tests were conducted in January 2007 after a full-scale TMT-15 additive test on the Petersburg Unit 2 FGD system showed limited effectiveness.