FY00-XXXIV-93
MERCURY SPECIATION SAMPLING
AT GREAT RIVER ENERGY'S STANTON STATION

CONTRACTOR: Energy & Environmental Research Center

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PARTICIPANTS

Sponsor	Cost Share
Energy & Environmental Research Center / DOE	$ 47,998
EPRI / GRE	44,000
ND Industrial Commission	44,000
Total Project Costs	$135,998

Project Schedule – Eight Months
Contract Date – 9/23/99
Start Date – 9/23/99
Completion Date – 4/01/00

Project Deliverables
Contract Execution – 9/23/99✓
Draft Final Report – 11/24/99✓
Final Report – 3/27/00✓

OBJECTIVE / STATEMENT OF WORK

The objective of this project was to determine the abundance and forms of mercury in flue gas emitted from a lignite-fired power plant and to determine the impact of these emissions on the environment. Measuring the abundance and forms of mercury emissions from the Stanton Station was achieved by determining the variability in mercury concentrations at the stack using mercury speciation continuous monitors (CEMs). CEMs were also used to measure total mercury at the stack. The overall mercury mass balance and mass balances across each of the air pollution control devices were calculated. Additionally, the mercury concentration in the fly ash as a function of size was also calculated. The impact of the air pollution control devices on mercury speciation was also determined.

STATUS

The following conclusions were drawn from the results of the testing at the Stanton Station:

- For both Units 1 and 10, the mercury emitted at the stack (duct leading to the stack) was almost all Hg^0,>95%.
- No mercury was captured by the ESP or on the filters of the sampling train.
- As was the case at Coal Creek and Milton R. Young Stations, the ESP at Stanton Unit 1 did convert a small amount of Hg^0 to Hg^{2+}.
- The spray dryer at Unit 10 removed almost all the Hg^{2+}, but little if any Hg^0.
- The CEMs gave total mercury results highly comparable to those obtained using the OH mercury speciation sampling method.
- The total mercury emission factors for Units 1 and 10 were 6.63±0.46 lb/10^{12} Btu and 6.27±0.45 lb/10^{12} Btu, respectively.
- Although the mercury concentration in the coal was somewhat variable, the overall average mercury balances were good for both Units 1 and 10, at 94.7% and 70.9%.
- Good mercury balances were obtained around the ESP in Unit 1 and the spray dryer/baghouse in Unit 10.