

**Field Test Program to Develop Comprehensive  
Design, Operating and Cost Data for  
Mercury Control Systems on  
Non-Scrubbed Coal-Fired Boilers**

**Quarterly Technical Report  
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**Principal Author:  
Jean Bustard  
Richard Schlager**

**ADA-ES, Inc.  
8100 SouthPark Way, Unit B  
Littleton, Colorado 80120**

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## **ABSTRACT**

With the nation's coal-burning utilities facing the possibility of tighter controls on mercury pollutants, the U.S. Department of Energy is funding projects that could offer power plant operators better ways to reduce these emissions at much lower costs.

Mercury is known to have toxic effects on the nervous systems of humans and wildlife. Although it exists only in trace amounts in coal, mercury is released when coal burns and can accumulate on land and in water. In water, bacteria transform the metal into methylmercury, the most hazardous form of the metal. Methylmercury can collect in fish and marine mammals in concentrations hundreds of thousands times higher than the levels in surrounding waters.

One of the goals of DOE is to develop technologies by 2005 that will be capable of cutting mercury emissions 50 to 70 percent at well under one-half of projected DOE/EPA early cost estimates. ADA Environmental Solutions (ADA-ES) is managing a project to test mercury control technologies at full scale at four different power plants from 2000 – 2003. The ADA-ES project is focused on those power plants that are not equipped with wet flue gas desulfurization systems.

ADA-ES has developed a portable system that was tested at four different utility power plants. Each of the plants is equipped with either electrostatic precipitators or fabric filters to remove solid particles from the plant's flue gas.

ADA-ES's technology injects a dry sorbent, such as activated carbon, which removes the mercury and makes it more susceptible to capture by the particulate control devices.

PG&E National Energy Group provided two test sites that fire bituminous coals and both are equipped with electrostatic precipitators and carbon/ash separation systems. Wisconsin Electric Power Company provided a third test site that burns Powder River Basin (PRB) coal and has an electrostatic precipitator for particulate control. Alabama Power Company hosted a fourth test at its Plant Gaston, which is equipped with a hot-side electrostatic precipitator and a downstream fabric filter.

During the fifteenth reporting quarter, progress was made on the project in the following areas:

### **Test Sites**

- Final Reports for the two remaining plants are being written (Salem Harbor and Brayton Point).

### **Technology Transfer**

- Technical information about the project was presented to a number of organizations during the quarter including members of congress, coal companies, architect/engineering firms, National Mining Association, the North Carolina Department of Air Quality, the National Coal Council and EPA.

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## **LIST OF GRAPHICAL MATERIALS**

There are no graphical materials included in this report.

## **EXECUTIVE SUMMARY**

ADA-ES began work on a Cooperative Agreement with the Department of Energy in October 2000 to demonstrate full-scale mercury control systems at coal-fired power plants. The project is the next step in the process of obtaining performance and cost data on full-scale utility plants for mercury control systems. Power generating companies that participated with host sites are PG&E National Energy Group, Wisconsin Electric Power Company and Alabama Power Company. During the three-year, \$6.8 million project, integrated control systems will be installed and tested at four power plants. ADA-ES is responsible for managing the project including engineering, testing, economic analysis, and information dissemination functions.

As of the fifteenth reporting quarter, field-testing has been completed at the following locations:

- Alabama Power Company Plant Gaston
- Wisconsin Electric Pleasant Prairie Power Plant
- PG&E NEG Brayton Point Station
- PG&E NEG Salem Harbor Station

Final site reports for the Brayton Point and Salem Harbor Stations are in preparation.

## **INTRODUCTION**

Cooperative Agreement No. DE-FC26-00NT41005 was awarded to ADA-ES to demonstrate mercury control technologies on non-scrubbed coal-fired boilers. Under the contract, ADA-ES is working in partnership with PG&E National Energy Group, Wisconsin Electric Power Company, Alabama Power, and EPRI to design and engineer systems to maximize effectiveness and minimize costs to curtail mercury emissions from power plant flue gases. Reports estimate that mercury control could cost the industry from \$2 to \$5 billion per year. Much of these costs will be associated with power plants that do not have wet scrubbers as part of their air pollution control configurations. The four plants that are being evaluated during the program are typical of this type of application, which is found at 75 percent of the nearly 1,100 units that would be impacted by new regulations.

Detailed topical reports will be prepared for each site that is tested under the program. Quarterly reports will be used to provide project overviews and technology transfer information.

## **EXPERIMENTAL**

Continued data and sample analysis for the project was conducted during the fifteenth reporting quarter. Detailed results of the testing at each power plant will be provided in separate topical reports.

### **Technology Transfer**

Technical information about the project was presented to a number of organizations during the quarter including members of congress, coal companies, architect/engineering firms, National Mining Association, the North Carolina Department of Air Quality, the National Coal Council and EPA.

## **RESULTS AND DISCUSSION**

The major efforts during the fifteenth reporting quarter focused on data analysis and completion of the final reports for Brayton Point and Salem Harbor power plants. Detailed results of the testing at these two remaining power plants will be provided in separate topical reports.

## **CONCLUSION**

Four plants have been tested, including Pleasant Prairie, Salem Harbor, Brayton Point, and Gaston. Final topical reports for Salem Harbor and Brayton Point are in preparation.

## **REFERENCES**

None this reporting period.

## **LIST OF ACRONYMS AND ABBREVIATIONS**

DOE	Department of Energy
EPA	Environmental Protection Agency
PRB	Powder River Basin