

**ANNUAL PROJECT REPORT
AS OF DECEMBER 1992**

1. PROJECT SPONSOR:

PEDCO INCORPORATED
11464 Lippelman Road
Cincinnati, Ohio 45246

2. PROJECT MANAGER:

W. H. Long
Vice President

TELEPHONE: (513) 771-2570

3. OCDO GRANT NO#: CDO/D 88-1

4. PROJECT: Final Report

5. PROJECT TITLE: MODIFICATION AND RELOCATION OF THE PEDCO ROTARY CASCADING BED BOILER

6. PROJECT TERM: FROM February 1989 TO August 31, 1992

7. PROJECT	<u>NAME</u>	<u>COST-SHARE</u>
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CO-SPONSORS:	OCDO	\$ 248,226
	PEDCO _____	
	ZURN	
	NORTH AMERICAN RAYON	
	PMC SPECIALTIES GROUP	
	TENNESSEE	
	PENNSYLVANIA (PEDA)	---\$2,755,360
	USDOE (SERBEP)	
	TVA _____	

TOTAL PROJECT COST:		\$3,003,586
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I. ABSTRACT

8. OBJECTIVES

There were two major objectives of the program to modify and relocate the Pedco Rotary Cascading Bed Boiler (RCBB). The first was to complete a demonstration of the commercial viability and attractiveness of the technology. The modifications, which were incorporated, were identified in the demonstration tests at the Hudepohl Brewery in Cincinnati as those desirable to increase the commercial appeal of the RCBB. The program verified the effectiveness of these improvements. The second major objective was to define a range of fuels, based on co-firing certain wastes with high sulfur and waste coals, which can be used by North American in particular and by industry in general, to provide lower cost energy while meeting the requirements of the Clean Air Act and the New Source Performance Standards.

9. WORK DONE AND CONCLUSIONS:

During the 1991-1992 test program approximately 2,000 hours of test were accumulated which included burning over thirty three different fuels and full combinations. In these tests it was clearly demonstrated that sulfur dioxide emission rates can be held well below the 1.2 pounds per million Btu requirements of the Clean Air Act by co-feeding economical amounts of inexpensive limestone screenings (calcium to sulfur ratios of 1.5 or less). The oxides of nitrogen were very low (less than 0.2 pounds per million Btu) throughout the tests due to the controlled temperature design of the combustion system. Particulate emissions as measured in the stack using EPA method 5 were 0.04 pounds per million Btu of fuel input using a very high ash (42.87%) composite mix for test purposes.

There were eleven different coals and coal wastes tested. These ranged in sulfur content from 1.8% to approximately 7%. Ash contents ranged up to 60%. The highest moisture was observed with the ponded fines which had an initial moisture content of about 22% but were then mixed with enough additional water to enable them to be introduced into the boiler with a Moyno pump.

Other materials burned, either with coals or alone, included coal tar, treated wood, municipal wastes, movie film, scrap tires and other rubber scrap, solvents and used oils.

The tests were highly successful and sufficient design information was obtained to carry forward the design and permitting of commercial 60,000 pound per hour boilers.

10. PLANS FOR COMING YEAR:

The test program under this Agreement is complete. However, at the request of major corporations tests of carpet scrap co-fired with coal were successfully completed in December of 1992.

The major effort will continue to be directed at the completion of design, fabrication and the installation of commercial units at the North American Rayon plant and in some of the other locations currently under active study.

II. HIGHLIGHTS/ACCOMPLISHMENTS

- 11.** The highlights and accomplishments of the program are many. The most important, however, is the demonstration that a boiler can safely and economically burn high sulfur coals and various wastes and still meet the emission requirements of the Clean Air Act. This offers industry low cost energy enhancing domestic and international competitiveness.

III. ARTICLES/PRESENTATIONS

- 12.** Senator Albert Gore visited the Elizabeth operation in January 1992 for a tour, demonstration and presentation. He expressed his support of the project and the belief that it offered a solution to the knotty problem of obtaining lower emissions while holding or reducing energy costs.

A presentation was made to Governor McWherter of Tennessee in September 1992.

A paper, Testing of the Pedco Rotary Combustion System at the North American Rayon Plant in Elizabethton, Tennessee, authored by the Center for Electric Power, Tennessee Technological University and Pedco was presented at the Purdue Industrial Waste Conference, May 1992.

Articles have appeared in The Resource Recovery Report, Pollution Engineering, Environment Today, Wastech 92 and in a number of newspapers.

Presentations have been made to a number of potential purchasers in Ohio, Tennessee, Virginia, North Carolina, Georgia and Colorado. In several such cases, future sales are very likely.