TECHNICAL PROGRESS REPORT

QUARTERLY

Reporting Period: 2-26-96 to 5-25-96

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Date of Report: 6-21-96

COOPERATIVE AGREEMENT NO. DE-FC22-95PC92638--04

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QUARTERLY TECHNICAL PROGRESS REPORT

CALDERON COKEMAKING PROCESS/DEMONSTRATION PROJECT CALDERON ENERGY COMPANY

COOPERATIVE AGREEMENT NO. DE-FC22-95PC92638

Reporting Period: 2-26-96 to 5-25-96

Date of Report: 6-21-96; Award Date: 5-25-95; Anticipated Completion Date: 7-22-97

Total Project: \$ 7,354,195.00 Total DOE Share: \$3,039,389.00

Contracting Officer's Representative (COR): Mr. Michael J. Baird

Project Director: Albert Calderon

Abstract

This project deals with the demonstration of a full size commercial coking retort using Calderon's novel process for making metallurgical coke. Tests are currently being conducted on a heat resistant alloy by subjecting such alloy to raw gases from an actual operating coke oven at LTV Steel's coke plant in Warren, Ohio to determine the effects of sulfurous gases on the alloy before ordering 232,000 lbs of this alloy for the full size commercial coking retort. Design engineering is proceeding.

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Executive Summary

It is intended to use large quantities of a special heat resistant alloy in the construction of the full size commercial coking retort. A standpipe with such heat resistant alloy was installed on April 17, 1996 on an operating coke oven at LTV Steel's battery in Warren, Ohio, to expose the alloy to actual raw coke oven gas. Engineering on the coking retort continued. Negotiations with Bechtel to serve as the Architectural Engineer were initiated.

Introduction

The U.S. DOE has entered into a cooperative agreement with Calderon to demonstrate a novel approach for making metallurgical coke by constructing and operating a full size commercial retort at Calderon's Alliance, Ohio test facility. This novel approach involves a technology developed by Calderon. LTV Steel has agreed to cooperate in this demonstration by contributing \$1.2 MM in-kind. LTV Steel has also issued a Letter of Intent indicating that if the demonstration is successful, LTV will buy the entire output of coke (500,000/year) from a commercial facility which will be built on LTV's premises, for a period of 20 years.

Results and Discussion

The full size coking retort to be demonstrated uses a heat resistant alloy (HR-120) made by Haynes International. The price per pound of this alloy is \$5.95. It is estimated that the coking retort will use 232,000 lbs of this alloy which will amount to an investment of \$1.38 million for material only (no fabrication).

In view of such cost, it was decided to test this alloy under the actual environment in which the alloy will be exposed in the coking retort. A standpipe made with HR-120 was constructed, and on April 17, 1996 it was installed on top of the coke oven battery of LTV Steel in Warren, Ohio. It is intended to observe the standpipe and examine the condition of the alloy after its exposure to raw coke oven gas for a period of nine months. This examination would include measurement of the thickness of the alloy to determine corrosion by H₂S attack.

In addition, during the period for which this report is concerned progress in the design of the equipment for the project has advanced satisfactorily. The pushing mechanism design has progressed sufficiently enough for a preliminary weight estimate. The weight for the retort itself has been developed. There was additional progress on the design of the valves; the preliminary weight of each valve to control the flow of coke is 80,000 lbs each. A study was conducted to determine access for maintenance of all three major components; namely, charging equipment, retort, and the changing of seals in the valves.

Discussions with the Mining and Metals Division of Bechtel have taken place. A secrecy agreement was executed with Bechtel and Bechtel has visited the Alliance site. Calderon representatives have visited Bechtel in San Francisco to initiate a cost estimate for Bechtel to determine whether or not it will be a contributor-participant to this project.

Conclusion

The monitoring of the standpipe in Warren will continue. Advancement in design will proceed. A decision by Bechtel is forthcoming during next quarter.

Submitted by:

Albert Calderon
Project Director