Calderon Cokemaking Process/Demonstration Project

Quarterly Report

Start Date: 06/26/2000 End Date: 05/25/2000

DEO Award No.: DE-FC22-95PC92638--20

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QUARTERLY TECHNICAL PROGRESS REPORT

CALDERON COKEMAKING PROCESS/DEMONSTRATION PROJECT CALDERON ENERGY COMPANY COOPERATIVE AGREEMENT NO. DE-FC22-95PC92638

Reporting Period: 2-26-00 to 5-25-00

Date of Report: 6-21-00; Award Date: 5-25-95; Anticipated Completion Date: 11-25-00

Total Project: \$ 6,332,060.00 Total DOE Share: \$3,039,389.00

Contracting Officer's Representative (COR): Carl Maronde;

Project Director: Albert Calderon

Abstract

This project deals with the demonstration of a coking process using proprietary technology of Calderon, with the following objectives geared to facilitate commercialization:

- (i) making coke of such quality as to be suitable for use in hard-driving, large blast furnaces;
- (ii) providing proof that such process is continuous and environmentally closed to prevent emissions;
- (iii) demonstrating that high-coking-pressure (non-traditional) coal blends which cannot be safely charged into conventional by-product coke ovens can be used in the Calderon process;
- (iv) conducting a blast furnace test to demonstrate the compatibility of the coke produced; and
- (v) demonstrating that coke can be produced economically, at a level competitive with coke imports.

The activities of the past quarter were focused on the following:

- Continuation of Negotiation with the Stakeholders of the Project
- Revision to Final Report of Phase I
- Finalizing the Statement of Work with NETL for Phase II
- Arrangements for Funding Fine-Tuned with NETL
- Permit Negotiation with Ohio EPA
- Progress in Preliminary Design
- Line-up of Suppliers as Participants
- Search for Qualified General Manager for Operation of the Facility

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Introduction

The commercialization path of the Calderon cokemaking process consists of the following general phases:

Phase I-- Proof of capability to produce acceptable product coke, proof of the process being environmentally closed, proof that non-conventional coal blends can be used, and proof that coke can potentially be economically produced domestically using U.S. metallurgical coals at a level competitive with low cost coke imported from foreign countries that are not subjected to U.S. environmental standards.

Phase II-- Scale-up of coking reactor to full size Commercial Demonstration Unit (CDU) in support of first commercial facility.

Phase III-- Construction and operation of first commercial facility.

Phase IV-- Worldwide commercialization of the technology aggressively by producing coke competitively and attaining a sizeable market share of the 400 million tons consumed globally per year.

Accomplishments and Discussion

Negotiations Among Stakeholders

During the past quarter, all the issues relating to the contracts among the stakeholders were settled in the Technology Supply Contract, the Equipment Supply Contract, the EPC Contract, Patent Rights Improvements, Infringement Strategy, Indemnities and Defaults. To finalize the Agreements the two outstanding issues that were not resolved were the fee schedule

for payment to Bechtel for lump sum turnkey contract, and the income split from the first commercial plant. These two issues are to be discussed in a special meeting on June 26, 2000.

Minor Revisions to Final Report on Phase I

The revised Final Report of Phase I was discussed at NETL, and minor revisions were proposed. These revisions were completed and the Report is in condition to be released to NETL.

Finalizing the Statement of Work for Phase II

The Statement of Work was discussed and updated several times during the quarter prompted by funding constraints and issues regarding testing activities as part of the preliminary engineering of Phase II. The Statement of Work has been completed and approved by NETL.

Arrangements for Funding with NETL Concluded for Phase II

The estimated total project cost is \$46 million in round numbers. Phase I being \$6 million and Phase II (as originally proposed) \$40 million, with a cost-sharing ratio of 50% from the private sector and 50% from DOE. Since Congress appropriated in FY2000 \$6.5 million and \$6.5 million is being appropriated in FY2001 at this writing, NETL could not enter into a cooperative wherein it would commit to cost-share \$20 million (50%) without an appropriation equal to \$20 million. NETL and Calderon agreed that the existing Cooperative Agreement can be extended to complete the construction of the commercial-size module at LTV and reduce the test period from a total period of 2 years to a period of two to six months with the available funding of about \$26 million. The intention is to request from Congress an additional appropriation in FY 2002 for \$7 million, and when such appropriation does occur, the

Cooperative Agreement will be modified to extend the testing to the original test period which includes 21 months of actual tests, preliminary design and cost estimate of the commercial plant for making coke, and post-operational activities.

Permit Negotiations with Ohio EPA

LTV Steel has insisted all along that the Calderon commercial size reactor at LTV's Cleveland Works should not be part of LTV's "Air Bubble" because of impacting the environmental permits that LTV has in place. Extensive negotiations took place during the quarter to make a case to Ohio EPA that the commercial size unit is for demonstration purposes and should be treated as a separate facility from LTV's. Such a ruling was finally concluded (letter attached).

Progress in Preliminary Design

This work centered around the up-dating of the design of the tiles for the reactor, changes to the anchoring system of the tiles, and selection of Carborundum as a contractor to make the tiles. A test order for three courses of tiles was negotiated in order to study the quality of the tile with emphasis on the absence of laminations, the finish of the working surface, and the maintenance of tolerances. Since Carborundum closed its U.S. manufacturing facilities for making SiC, the work had to be done in Brazil. The facilities in Brazil were inspected and were found to be adequate to do this work. The anchoring mode of tiles has not been finalized. After the three courses are completed and inspected, it is quite possible that changes may be required to the tiles since such tiles were never made before; the tiles will be assembled and stacked in courses for the first time.

The design of the tiles on a preliminary basis will lay the foundation for up-dating the coal charger design which in turn lead to the preliminary design of the shells that contain the tiles of the reactor. Several meetings have take place with Unifrax to discuss the selection of the insulating material and the mode of installation between the tiles and the shells.

The quenching equipment for the preliminary tests at Alliance, to demonstrate the flow of the coke in a submerged condition has been completed. The design needs to be checked before fabrication begins.

Work has begun to assemble test equipment for hydrocarbon injection to deposit carbon onto the sorbent.

Line-up of Suppliers as Participants

Calderon Energy has in the past recruited suppliers to contribute in-kind in the form of cost reduction in equipment and services. For Phase II Calderon Energy has lined up Alliance Machine for machinery, Kickham Boiler for various fabrication including vessels, and Carborundum (St. Gobain) for SiC tiles and high performance refractories, and as the project advances there will be other contributing suppliers.

Search for Qualified General Manager of the Facility

The selection of a qualified General Manager is a critical decision. The qualification of such a person must be that he should have experience in the making of coke, knowledge of heavy mechanical and gas handling equipment, capacity to work within a defined budget, and dealing with a work force engaged in maintenance, operation, and technology. The search has begun and a past operator with many years of experience in cokemaking has been interviewed.

Conclusion

During the next quarter, it is anticipated that the Cooperative Agreement with NETL is extended for Phase II, the various agreements among the stakeholders are executed, the permit will be in place, the coal charger design up-date completed, and work begun on Tasks 1, 2 and 3 of the Statement of Work.

Submitted by:

Albert Calderon
Project Director

OhioEPA
State of Ohio Environmental Protection Agency

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April 21, 2000

Reina A. Calderon
Vice President and General Counsel
Calderon Energy Co. of Bowling Green
P.O. Box 126
Bowling Green, Ohio 43402

Dear Ms. Calderon:

We have reviewed your November 8, 1999 letter to Mr. Robert Hodanbosi, Chief, Division of Air Pollution Control. So long as the representations asserted in your letter are true and you have stated all relevant facts, we agree that the "Calderon Project" and LTV's Cleveland Works integrated steel manufacturing facilities, for purposes of Title V and New Source Review permitting would constitute two separate stationary sources.

This determination is based upon two bases:

1. Based upon your representations, our attorney has determined that no common control exists between LTV and Calderon. You should be aware, however, that USEPA, in the past has not necessarily agreed with this conclusion because there is a contractual relationship due to the leasing of the LTV land to locate the project on and to buy some of the product produced as part of the research program. However, we believe that USEPA might take into consideration that the lease and the contract for LTV to buy some of the product produced as part of the research program do not materially benefit LTV and therefore would not be considered a part of LTV's operation; and,
2. as mentioned above, Calderon is operating an research program (R&D) facility. As such, we believe that USEPA will accept the Calderon Project as a separate source. USEPA's most recent pronouncements (1995 and after) have indicated that they are in agreement with our state guidance in treating R&D facilities separately.

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Reina A. Calderon

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If you have additional questions, please contact me at (614) 644-3613.

Sincerely,

Alan Lloyd

Air Quality Modeling & Planning

Division of Air Pollution

AL/all

cc: Jeanne Mallett, OEPA/Legal
Robert Hodanbosi, DAPC
Lian Ang, City of Cleveland, Air Permits Division

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