Box MPR--14

TECHNICAL SECTION

of

PROGRESS REPORT NO. 14

on

CONTRACT NO. 14-32-0001-1513

to

OFFICE OF COAL RESEARCH

March 20, 1974

BATTELLE
Columbus Laboratories
505 King Avenue
Columbus, Ohio 43201

TECHNICAL SECTION

of

PROGRESS REPORT NO. 14

on

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OFFICE OF COAL RESEARCH

from

BATTELLE
Columbus Laboratories

March 20, 1974

INTRODUCTION AND PROJECT OBJECTIVE

This progress report describes work completed by Battelle on the Coal Gasification Program during the period February 16 - March 15, 1974. The section that follows is the technical section. The administrative and financial section is appended.

The general objective of the current contract is development of a two-stage fluidized-bed process utilizing a self-agglomerating fluidized-bed burner as part of a practical and economical method for producing synthesis gas by steam gasification of coal. The developed process is to be useful as part of a system for producing synthetic pipeline gas or for other purposes.

Pursuant to the general objective, a 25-ton-a-day-of-coal Process Development Unit (PDU) is to be erected and operated and the following aspects of the process explored:

- The operability of a self-agglomerating fluidized-bed coal burner operating on an Eastern bituminous coal under pressure and using air for combustion.
- The mechanical feasibility of continuously circulating a burden of hot-ash agglomerates between fluidized-bed burner and fluidized-bed gasifier vessels at 100 psig of pressure

and the rates and temperatures required for effective heat transfer.

- The operability of integrated fluidized-bed burner and gasifier vessel both fed by Eastern bituminous coal (or char in the case of the burner) and operating at 100 psig of pressure. The gasifier is to be fluidized by steam and the endothermic heat of gasification is to be provided by the circulating burden of hot-ash agglomerates.
- The operability over extended time periods of a power-recovery turbine using hot, fluidized-bed burner effluent gases as the turbine working fluid.
- The factors that influence the long-term operability of the process. Included is to be the gathering of data on all key process variables and their effect on the characteristics of the process.

Concurrent with operation of the PDU, sufficient process data and information will be acquired to permit scale-up of the process to its next logical stage of development.

SUMMARY

During this reporting period, work was continued by Chemico on the detailed engineering design and procurement of equipment for the Battelle Coal Gasification PDU. A preconstruction conference was held in Columbus between Chemico and representatives of local organized labor.

Field construction activity did not begin when we had expected it to start. The delay is apparently related to inability to obtain structural steel in conformance with Chemico's most recent schedule. Chemico reports that it is trying to resolve this problem and will provide us with a new start date as soon as possible.

Subcontract Modification No. 1 was approved by OCR during this period and Chemico and Battelle are currently concluding negotiations of the modification.

A meeting was held in New York with the AGA Coal Gasification Project Advisors. Various factors related to the technical progress of the PDU program were discussed with the advisors by Chemico and Battelle. Aministrative meetings were also held between Chemico's management and representatives of OCR, AGA, and Battelle.

Battelle continued work with the subcontractor on technical points related to finalizing the PDU design and expediting the acquisition of PDU equipment. Substantial activity at Battelle also dealt with the turbine acquisition and with assisting Chemico and potential refractory suppliers with the refractory design. Additional experimental work is in progress to generate data needed to firm up the design of the hot solids transfer loops.

WORK COMPLETED

Contractual

During this reporting period Battelle received OCR's approval of subcontract Modification No. 1 including authority to increase the funding of the Chemico subcontract. Copies of subcontract Modification No. 1 sent to Chemico for signature on January 24 were returned signed and with certain exceptions by Chemico. Negotiations are in progress regarding the Chemico exceptions.

Detailed Engineering Design of the PDU

Chemico Activity

The Chemico schedule received on December 17 which has been the basis of the schedule reported in our monthly progress reports is no longer valid. Chemico is unable to provide an up-to-date schedule at this time because of uncertainties about delivery of critical

materials (e.g., structural steel). We hope to receive an updated schedule within the next two weeks.

We have been advised informally that Chemico presently believes that the PDU turnover to Battelle can be accomplished in the first quarter of calendar year 1975. This is a delay of at least four months in the turnover date which we have been reporting.

Chemico is presently continuing work on engineering design and procurement directed at meeting a first quarter 75 or earlier turnover date. A synthesis of information provided by Chemico's weekly reports during this reporting period, their monthly report on March 8, and information obtained by our resident Project Engineer, R. R. Adams, provides the following status of activities.

Progress Flow Diagrams and Equipment Data Sheets. Updated process flowsheets for sections 100 through 600 were received from Chemico on February 18. These were extensively reviewed at Battelle. On March 14, a session was held at Chemico in which F. Hollis and L. Rice from C. F. Braun and Company participated in review of our comments on the flowsheets. A substantial number of corrections and changes which should be made to the drawings and heat and material balances resulted from this discussion. Chemico is proceeding to make the necessary modifications.

- Process and Utility P&I's

The most recent process P and I's (Sections 100 through 600) issued by Chemico are those designated as Issue 1 dated December 12, 1973. These are under continuing examination at Battelle. Based on these examinations and discussions with the Braun personnel, we know that there are changes which must be made. Chemico is aware of most of these changes and it is expected that they will issue an updated version of the process P and I's within the next few weeks.

We have preliminary P and I's for the natural gas and air system, the inert gas system (schematic flow diagram), the steam system, and the cooling water distribution system. All of these items comprise Issue O dated December 12, 1974. Various material balance information must be generated by Chemico for these sheets prior to a second issue. Because flowsheets are not being made for the utility sections of the PDU we have asked Chemico to tabulate the material balance information on the utility P and I's. We are uncertain regarding when the updated drawings will be issued.

- Requisitions and Purchases

Table 1 provides Battelle's summary of the status of procurement of the major items of process equipment. It is estimated that 45 percent of the items of process equipment have been fully approved for purchase. For another 17 percent, Battelle has authorized Chemico to issue letters of intent subject to later Government approval. Another 35 percent of the equipment is out for bids and the remaining 3 percent has not been requisitioned yet by Chemico. Chemico's estimate presented in their report appended to the Administrative Section when broken into these same categories by Battelle indicates: 2.8 percent of the equipment items have not been requisitioned, 29 percent are either out for bid or bids are being reviewed, and 68 percent are either purchased or authorized by letter of intent. We consider the Chemico figures to be in reasonably good agreement with our own when account is taken of minor differences in definition.

A listing of the major items of equipment for the PDU showing their status in the procurement cycle is appended as Table A-1.

Severe problems are arising with regard to materials delivery as outlined later in this report.

- General Arrangement Drawings (Including floor plans and elevations)

During this reporting period Chemico provided us with updated general arrangement drawings. The floor plan and elevation drawings show

TABLE 1. MAJOR PROCESS EQUIPMENT ITEMS STATUS SUMMARY

Process Area[a]	Total Items	Not Requisitioned	Requisitions Out	Purchase Approved	LOI Approved
100	5	0	1	1	3
200	11	0	2	8	1
300	10	0	6	3	1
400	10	0	2	8	0
500	19	1	4	5	9
600	17	2	10	4	1
700	8	0	3	5	0
800	12	0	7	3	2
Misc[b]	19	0	4	13	2

(a) The section numbers and corresponding descriptive section names are

Section	Name
100	Coal Receiving and Storage
200	Coal Preparation and Grinding
300	Coal Pretreatment
400	Coal Feed System
500	Coal Gasification
600	Gas Treatment
700	Air, Inert Gas, and Natural Gas Utilities
800	Steam and Water Utilities.

(b) Structural steel, anchor bolts, reinforcing bars, etc.

major equipment and piping. These are being reviewed by the Battelle project staff. Copies have also been turned over to Battelle's Plant and Facilities Department for their use regarding making site modifications.

- Piping

Stress and other calculations for piping are being continued by Chemico. In order to give better assurance of the solids transfer between the burner and gasifier vessel in early operations of the PDU, this piping system is being changed from one incorporating "U-bends" to one which is similar to the piping system used with fluidized-bed coking operations. Related to this piping modification it is necessary to change two nozzle orientations on the gasifier vessel.

We are informed that four of the five required piping plans for various levels in the PDU are in progress. Also, Chemico has issued purchase orders on the hot-solids control valves.

Chemico has requested that, for our relatively small need, they be allowed to place an order for tonnage fabricated piping as a part of a larger piping order involving other Chemico jobs. This is standard practice and will save money and probably time. We have advised Chemico to proceed with the order while we obtain government approval.

- Structural Steel

Chemico issued the structural steel drawings for the outer structure for fabrication on February 14. Steel drawings for the inner structure were released for material take-off, detailing and mill ordering on March 9. As scheduled these drawings should have gone to the steel fabricator in mid-December (outer structure) and early January (inner structure). We have been informed that there is a possibility of not obtaining a portion of the steel for fabrication until the third quarter (calendar) of 1974. We do not know to what extent this late issuance of the drawings is responsible for the situation. The steel fabricator has

advised both Chemico and Battelle that he cannot meet his commitment to deliver the steel columns this spring.

Chemico's expediters are working to determine what can be done to improve steel delivery. At present the problem is unresolved.

- Foundations

We received drawings of the foundations stamped "preliminary" during this reporting period. We are informed by Chemico's monthly report for February that the foundation drawings for the outer structure have been finalized and are being checked at Chemico. The drawings for the inner structure foundation are not final and Chemico indicates some difficulty in that interferences with the existing building JS-2 foundations are being encountered. The preliminary foundations drawings have been turned over to Battelle's Plant and Facilities Department for examination.

- Electrical

We have recommended a vendor for the motor control centers to OCR/AGA and Chemico has been authorized to issue a letter of intent. Sketches of elementary diagrams for motor circuits have been prepared by Chemico and are expected to be drafted soon. Chemico reports that the elementary control diagrams for the interlock systems have been "finalized"; however, Battelle does not have copies of these diagrams yet.

Electrical substations were purchased and their layout drawings were completed as reported previously. A one-line diagram was reported to have been completed by Chemico several months ago.

- Equipment Deliveries

The first and only Materials Status report received to date from Chemico was accurate as of early February. Examination of it

indicates that delivery of the following equipment to the site should already have taken place:

Equipment Item No.	Name
E-604	Recycle make gas cooler
-	Weigh Systems (load cells)
P-401 A/B	Bag Filters and Bin Vents

Delivery of the following would be expected during the forthcoming reporting period:

Equipment Item No.	Name
K-701 A & B	Process Air Compressors
G-701 A & B	Process Air Receivers
G-401 A through G-406	Coal Feed Bins and Lock Hoppers
D-201	Inert Gas Generator (for coal pulverizer)
K-201	Main Fan
K-202	Auxiliary Fan
K-203	Combustion Air Blower
O-201	Coal Pulverizer
P-201	Cyclone Separator
P-203	Bag Filter
D-803	Steam Superheater
P-204	Vibrating Screen
R-701	Instrument Air Dryer Package

To date none of the equipment has been received at the site. The vendor attempted delivery of some of the items of compressor equipment but, because no arrangements had been made by Chemico for receipt at the site, the equipment was warehoused locally. Planning is currently under way at Chemico with regard to the way deliveries are to be handled.

- Construction

Construction work at the site by Chemico has not started. A preconstruction conference was held in Columbus on February 21 between Chemico and representatives of local organized labor. At this meeting April 1 was stated by Chemico to be the earliest date at which work at the site would begin.

Chemico's monthly report provides no statement as to why construction has not started nor when it might. We presume that they are awaiting a resolution of the structural steel problem before providing a new date for start of construction.

Battelle Activity Directly Related to Detailed Design and Installation of the PDU

The major activity by Battelle related to the PDU has been examination of specifications for purchase requisitions, study of bids and bid analyses transmitted by Chemico, review of various engineering drawings and general technical interface with Chemico.

T. L. Tewksbury, Battelle's Supervisor of Operations for the PDU, has devoted a significant amount of time to flowsheet review and to directing experiments at Battelle related to acquiring data necessary to firm up the solids transfer loop design. As noted earlier in this report, a general review of the process flow sheets with Chemico was conducted by Mr. Tewksbury with C. F. Braun and Company participation.

Several quotations for refractory supply and installation for the major vessels and let-down lock hoppers have been received at Chemico. We are not satisfied that proper engineering insight has been applied in the development of the quotations. Therefore, we have assigned Battelle's Thermal and Mechanical Energy Systems Section to assist in developing a suitable detailed refractory design.

During this reporting period proposals were received from most of the vendors interested in supplying the gas turbine for the PDU. An internal review meeting is scheduled in which we hope to narrow the field

of bidders to three with the assistance of Mr. R. D. Fischer, Battelle's principal engineer for this activity.

Drawings for a building to house auxiliary equipment (building to be provided by Battelle) are to be sent to Chemico to allow them first opportunity to bid. Our Plant and Facilities Department, the customer in the case or this building, believes it may be more convenient and expedient to have the building erected by Chemico if their bid is competitive.

We still do not have formal notification that our EPA permits are approved although we expect this formal notification at any time. Currently the problem of an increased natural gas requirement at the site is being discussed between the Battelle and Ohio Public Utilities legal staffs.

Within this reporting period, Battelle's Mr. B. P. Faulkner (Minerals and Metallurgical Processing Section) visited the shop of Williams Patent Crusher and Pulverizer Company to inspect the coal mill being provided by them for the PDU. As a consequence of this visit we believe Williams is providing us with a quality product capable of supplying our needs.

Administratively, Bob Adams has continued in residence at Chemico's offices for purposes of expediting approvals, speeding the interchange of technical information between Battelle and Chemico, and generally monitoring the subcontractors activity. Mr. Adams and Mr. R. E. Monroe of Battelle's Manufacturing Technology Department visited Stacey Manufacturing Company's Shop to expedite (with Chemico) the fabrication of the burner and gasifier vessels and to provide assurance that the welding procedures* proposed by Stacey are acceptable.

PROBLEMS AND RECOMMENDATIONS

Items of continuing concern are those related to administrative

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*Because of a delay in delivery of the forged flanges originally planned for the vessels, we had to make a decision regarding the suggested use of welded flanges fabricated from plate as substitutes.

and financial aspects of the program as are indicated in the Financial and Administrative Section of this report.

The problem noted in the previous monthly progress report regarding ability to obtain adequate natural gas for the PDU operation is unresolved. However, at present, this problem is of a relatively low order of importance and is out of the hands of the project staff for the immediate future.

A problem of major concern is the delivery of materials to vendors of equipment and structural components for the PDU. The average promise for delivery of PDU equipment items is running in excess of 25 weeks. Even promised deliveries do not have much meaning when it comes to actually meeting the promised date. One case in point is the situation with structural steel already noted. Another delivery problem which we believe is resolved is that related to the large flanges for the burner and gasifier vessels. The only way we could assure delivery of the vessels in a reasonable length of time was to pay a premium for steel plate from a warehouse from which flanges could be fabricated.

We are taking the following actions to minimize the problems related to deliveries:

(1) Requested that Chemico insure that the vendors have drawings and other technical information at the times anticipated as necessary by the vendors in their bids.

(2) Asked Chemico to give increasing attention to their expediting function.

(3) Requested that Chemico "scrounge" around for used materials of construction (in the case of steel columns).

(4) Instructed Chemico to ask vendors how much delivery can be improved if premiums are paid (unless Chemico already is asking this question).

(5) Spoken with OCR on several occasions about the possibility of obtaining a government priority on materials.

WORK PLAN AND SCHEDULE

Major emphasis will be given to our activities associated with installation of the PDU.

At present Chemico is working without any formal schedule--at least any schedule of which we are aware. We have been promised and expect to receive an updated schedule within the next two weeks. Until we obtain this schedule we cannot provide an overall updated schedule for the program.

APPENDIX

DETAILED STATUS OF EQUIPMENT PROCUREMENT

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DETAILED STATUS OF EQUIPMENT PROCUREMENT

TABLE A-1. STATUS OF PDU EQUIPMENT PROCUREMENT

1. Purchase orders have been authorized for the following items:

Equipment Item Number	Name	OCR/AGA Authorization Sheet Serial Number
G-101	Coal Pulverizer Surge Hopper	2
D-201	Inert Gas Generator (for Coal Pulverizer)	3
K-201	Main Fan	3
K-202	Auxiliary Fan	3
K-203	Combustion Air Blower	3
O-201	Coal Pulverizer	3
P-201	Cyclone Separator	3
P-203	Bag Filter	3
P-204	Vibrating Screen	19
O-301	Screw Conveyor Cooler	11 Rev. 1
P-301	Coal Pretreater Cyclone	9
J-301A&B	Oil-Solids Pumps	22 & 23
P-401A/B	Bag Filters and Bin Vents	14
G-401A	Combustor Feed Bin	2
G-401B	Gasifier Feed Bin	2
G-402	Combustor Feed Pressure Hopper	2
G-403	Combustor Feed Injection Hopper	2
G-404	Pretreated Coal Receiving Bin	2
G-405	Gasifier Feed Pressure Bin	2
G-406	Gasifier Feed Injection Bin	2
H-501	Combustor Vessel	6
H-502	Gasifier Vessel	6
O-502	Ash and Char Conveyor Cooler	11 Rev. 1
P-501	Combustor Cyclone	9
P-502	Gasifier Cyclone	9
J-601A&B	Venturi Circulating Pumps	22 & 23
J-602A&B	Venturi Circulating Pumps	22 & 23
G-603	Sludge Settler Tank	13
E-604	Recycle Make Gas Cooler	5

TABLE A-1. (Cont'd)

Equipment Item Number	Name	OCR/AGA Authorization Sheet Serial Number
G-701A&B	Process Air Recievers	1
K-701A&B	Process Air Compressors	1
D-702	Inert Gas Generator	16
G-702	Inert Gas Receiver Tank	21
R-701	Instrument Air Dryer Package	18
J-702	Inert Gas Generator Slurry Pump	Included in 16
G-802	High-Pressure Water Storage Tank	13
D-303	Steam Superheater	12
R-804	Water Treatment System (Cooling Tower)	None Required
	• Restrictor Valves	None Required
	• Panel Instruments	4
	• Unit Price Structural Steel	7
	• Weigh Systems	8
	Gas Analyzers	10
A-190	Anchor Bolts (unit price)	None Required
V-050	Instrument Control Panel	15
V-020	Transformer Substations	17
U-041	Receivers - Panel Mounted	Included in 15
T-550	Hot Valves for Let-Down Lock Hoppers	26
T-550	Emergency Hot Shut-Off Valves	25
T-550	Throttling Valves for Hot Solids	24
U-030	Multipoint Temperature Indicators and Recorder	27

2. Bids have been received by Chemico on the following items. These bids have been reviewed by Chemico, their recommendations have been made to Battelle and requests for authority to purchase have been submitted to OCR/AGA after Battelle's review.

G-102	Coal Receiving Hopper	29
R-101	Grizzly	29
O-101	Coarse Coal En Masse Conveyor/Elevator	30
O-205	Ground Coal Conveyor/Elevator	30
D-602	Combustor Furnace with Stack	32
D-802	Package Steam Boiler	20
R-803	Cooling Tower and Erection	28
V-100	Motor Control Centers	31

TABLE A-1. (Cont'd)

Equipment Item Number	Name	OCR/AGA Authorization Sheet Serial Number
G-501	Combustor Cyclone Receiving Hopper	33
G-502	Combustor Cyclone Let-Down Hopper	33
G-503	Gasifier Cyclone Receiving Hopper	33
G-504	Gasifier Cyclone Let-Down Hopper	33
G-505	Char Receiving Hopper	33
G-506	Char Let-Down Hopper	33
G-509	Gasifier Ash Let-Down Hopper	33
G-510	Combustor Ash Let-Down Hopper	33
G-511	Cooler Conveyor Receiving Hopper	33
H-301	Coal Pretreater	34

3. Bids have been received from Chemico on the following items, they have reviewed the bids and have made recommendations to Battelle. We await conclusion of the Battelle bid review to recommend purchases to OCR/AGA.

	• Pinch Valves
V-802	Emergency Electrical Generator
A-190	Reinforcing Bars
	• Radiation Type Density Gages and Level Switches

4. The following items are out for bids.

K-204	Screened Coal Blower
P-205	Screened Coal Cyclone
RV-301	Rotary Valve
RV-302	Rotary Valve
R-301	Pretreater Venturi Scrubber
P-302	Pretreated Coal Bag Filter
K-303	Pretreated Coal Blower
P-304	Gas Separator
RV-401	Rotary Valve
RV-402	Rotary Valve
K-501	Start-Up Recycle Blower
H-501	Combustor Refractories
H-502	Gasifier Refractories
D-501	Start-up (and Pretreater) Heater

TABLE A-1. (Cont'd)

Equipment Item Number	Name
R-605	Gas Dryer Package
E-505	Recycle Make Gas Aftercooler
R-601	Flue Gas Venturi Scrubber
R-602	Make Gas Venturi Scrubber
K-604	Combustion Air Blower
P-603	Prefilter
P-604	Afterfilter
P-601	Gas Separator
P-602	Gas Separator
K-603	Recycle Make Gas Booster Compressor
J-801A&B	Boiler Feedwater Pumps
G-801	Deaerator
R-801	Boiler Feedwater Treatment System
J-802A&B	High Pressure Water Storage Tank Pumps
J-803A&B	Cooling Tower Water Pumps
J-804A&B	Valve Cooling Water Pumps
U-030	Annunciators (Revision)
U-041	Receivers

5. Requisitions have been drafted on the following items and are currently being reviewed or revised at Chemico.

E-703	Instrument Air Aftercooler
G-703	Instrument Air Receiver
K-703A&B	Natural Gas Booster Compressors

6. Among the items upon which no specifications for requisition have been written by Chemico yet are the following.

P-503	Vibrating Screen
E-601	Sample Gas Cooler
J-603	Transfer Pump

FINANCIAL AND ADMINISTRATIVE SECTION

of

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March 20, 1974

BATTELLE
Columbus Laboratories
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BATTELLE
Columbus Laboratories

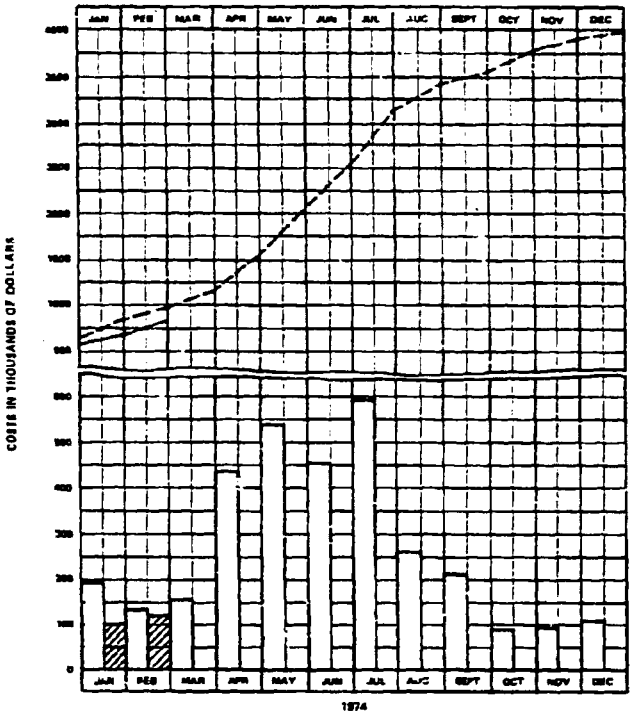
March 20, 1974

Table B-1 presents the Task Cost and Manpower Projection form for the month ending February 28, 1974. Billings have been received from Chemico for New York operating costs through January and all of their fee except for the final payment which by contract is withheld. No more current billings have been received to date. Total actual disbursements to Chemico are $457,257.96.

As shown in the attached monthly report of Chemico, they estimate their February billing will be $54,000. The Chemico estimate for February is not included in Table B-1 because we have not received nor paid this billing. It is estimated that, as of March 1, a total of about $511,000 has been spent by Chemico on engineering, procurement, and other activities related to their current phase of work. Chemico has been authorized to commit an additional $1,060,000 (approximately) to suppliers of equipment for the PDU. About $210,000 of this is in letters of intent authorized by Battelle. They have, as indicated in their appended report, committed $915,000 of this.

The cumulative expenditures of Battelle, including payments to Chemico to date are about $808,000, as shown in Table B-1. The sum of actual expenditures to date, the estimated billing for February by Chemico,

TABLE B-1.
BATTELLE PDU
TASK COST AND MANPOWER PROJECTIONS
MONTH ENDING FEBRUARY 28, 1974



MANPOWER (MAN-MONTHS)

Prod.	6.0	6.0	6.0	6.0	6.5	6.5	8.0	8.0	11	11	13	15
Act.	4.3	4.0										

DIRECT LABOR & OVERHEAD COSTS (THOUSANDS OF DOLLARS)

Prod.	21.8	19.8	22.8	25	25	25	32.5	36	60.8	65	77	96.5
Act.	19.6	18.2										

SUBCONTRACT AND CONSULTANT COSTS (THOUSANDS OF DOLLARS)[1]

Prod.	168	115	128	404	504	422	556	221	145	7	0	0
Act.	77.9	103										

NON-EXPENDABLE EQUIPMENT (THOUSANDS OF DOLLARS)[2]

Prod.	0	0	0	0	0	0	0.5	1.0	1.2	10.0	4.0	1.5
Act.	0	0										

MATERIALS, SUPPLIES, TRAVEL, AND ODC (THOUSANDS OF DOLLARS)[3]

Prod.	3.2	3.2	5.2	5.0	5.0	5.0	2.0	3.0	6.0	8.0	12.0	12.0
Act.	3.2	1.4										

TOTAL (THOUSANDS OF DOLLARS)[4]

Prod.	194	138	156	434	534	452	591	261	213	90	93	110
Act.	100.7	123										

KEY TO GRAPH:

PREDICTED TOTAL COSTS — ACTUAL TOTAL COSTS

PREDICTED CUMULATIVE — ACTUAL CUMULATIVE

NOTES:

(1) OUTSIDE CONSULTANTS

(2) NON-EXPENDABLE EQUIPMENT TO BE PURCHASED BY SUBCONTRACTOR IS INCLUDED IN SUBCONTRACT CATEGORY

(3) COST OF BATTELLE RESIDENT CONSULTANTS INCLUDED IN THIS CATEGORY

(4) DOES NOT INCLUDE BATTELLE G&A

and equipment purchase order authorizations is about $1,922,000 or 51 percent of the currently encumbered* funds for the program.

On page 2 of the attached Chemico report, Chemico has informed us that the predicted total cost of the PDU subcontract is now $3,446,000 and this does not include an additional estimated $150,000. Consequently, we believe Chemico is estimating their projected costs at about $3,596,000 or 14.4 percent above those authorized by subcontract modification No. 1. This estimate has increased by about 4.5 percent over the estimate reported in our previous monthly report.

Estimates of an increase beyond the $3,143,000 subcontract modification have been attributed by Chemico to revisions made to unapproved drawings. They have chosen to call these revisions "Engineering Change Orders" or "E.C.O.'s" previously. Because of the connotation of this term in the construction industry Battelle has taken exception to its use on several occasions. Chemico has suggested that instead of "Engineering Change Order" the term "Estimating Change Order" be used. Battelle has accepted this suggestion.

On March 14, administrative meetings were held at Chemico between OCR, AGA, Battelle, and Chemico. During those meetings the concern of Battelle and the Sponsors about the status of this program was expressed. Chemico assured us of the importance of the Battelle PDU project to Chemico and informed us of actions it plans to take. Among these actions are

(1) More direct, day-to-day involvement of Chemico process plant company's vice president of special projects, Mr. Stanley Noss, in our program. Included are regularly scheduled daily meetings between Mr. Noss and the Chemico Project Staff.

(2) Assignment of supplemental manpower to the project at the project manager and project engineer levels.

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*Letter from Mr. James A. Nelson (OCR) to Battelle dated February 25, 1974.

(3) A project review meeting with Battelle on a regularly scheduled, every-two-weeks basis.

(4) Improved formal reporting of the project status to Battelle.

The first project meeting is scheduled for the week of March 25. We expect that Chemico will have an updated schedule available at the meeting and will also propose what documents they will submit to Battelle on a regular basis.

BATTELLE-COLUMBUS LABORATORIES
PERSONNEL ASSIGNED TO PROJECT*

(1) W. M. Goldberger
(2) W. C. Corder
(3) R. R. Adams
(4) T. L. Tewksbury
(5) H. R. Batchelder (Staff Consultant)
(6) R. D. Fischer

CHEMICAL CONSTRUCTION CORPORATION
PERSONNEL ASSIGNED TO PROJECT*

(1) F. W. Peterson
(2) E. M. Ezcurra
(3) E. T. Coles
(4) J. B. Perrone
(5) H. Osborne
(6) P. S. Schlaff
(7) M. Getty
(8) N. Razfar
(9) A. Yuen
(10) A. Judd
(11) M. Rosengarten
(12) S. Sun
(13) G. Elsis
(14) M. Dowd

*Only staff who devote significant portions of their time to the program are listed. Various others have temporary assignments.

CHEMICO

Chemical Construction Corporation

ONE PENN PLAZA • NEW YORK, N. Y. 10001
(34th Street between 7th & 8th Avenues)
Telephone: (212) 239-5100 • Telex: 234110 • Cable: CHEMICO

PROJECT	INITIALS
STANDARD	
Goldberger	
Adams	
Corder	
DIV. FILES	
GEN. FILES	
ZERO COPIES FOR	
RECD MAR 11 1974	
Evans (letter) & report	

March 8, 1974

Return to

Mr. W. C. Corder
Minerals and Metallurgical Processing
Division
Battelle Memorial Institute
Columbus Laboratories
505 King Avenue
Columbus, Ohio 43201

Letter No. CB-178
Contract 1947J
Re: Battelle's Columbus Laboratories
Coal Gasification
Process Development Unit

Monthly Status Report

Dear Bill:

Attached is one copy of our Status Report dated March 8, 1974.

Very truly yours,

Fritz W. Peterson
Assistant Manager Operation

FWP:d
w/attachments
Monthly Status Report
Comparative Cost Statement
Period Ending 2/25/74

JOB 1947

BATTELLE'S COLUMBUS LABORATORIES

COAL GASIFICATION PDU

STATUS AS OF MARCH 8, 1974

A). Overall Status

Chemico received from Battelle Modification 1, changing the contract cost from $1,870,000 to $3,143,000. The Modification has been reviewed and returned to Battelle.

The compressor and the grinders are ready for shipment.

Chemico has been informed that steel is scheduled for the first and second quarters and columns for the third quarter. Fabricated steel would be delivered six to eight weeks after that. This results in a very serious delay and Chemico will expedite the steel and will report the results to Battelle.

On March 1, 1974 Chemico and Battelle reviewed the fluidized circuit with Mr. R. W. Pfeiffer. Mr. Pfeiffer has recommended certain changes to the piping arrangement and nozzles to the Gasifier.

B). Financial Status

Purchase Orders and Letters of Intent	$ 915,000.00
Billings up to February 13, 1974	406,568.41
Estimated Billing for February	54,000.00
Estimated Billing for March	55,000.00
	$ 1,430,568.41

B). Financial Status (continued)

Attached is the Comparative Cost Report for the Period Ending February 25, 1974, showing a Predicted Total Cost of $3,446,000. This figure includes E.C.O.s Nos. 1, 2 and 3. It does not include E.C.O. No. 4 or remaining ones to be written on outstanding Design Sheets. The internal structure increased in width, which will increase the cost of structural steel; this cost is in E.C.O. No. 4. E.C.O. No. 4 is estimated to be in the order of $150,000 and will be included in the next cost report.

C). Material Status

1. A to C Material

	(% Based on Estimated Cost) %
Total Purchased	69.4

2. D to R Equipment

		(% Based on Estimated Cost) %
a.	Requisitions not started	0.5
b.	Requisitions being prepared	2.3
c.	Requisitions being reviewed or revised	0.6
d.	Approved Requisitions being processed	0.0
e.	Requisitions out for bids	16.6
f.	Quotes being evaluated by Engineering	0.8
g.	Evaluations under Project review	0.0
h.	Recommendations submitted to BCL	10.8
i.	Approved for purchase or letter of intent	6.6
j.	Equipment committed but not purchased	5.7
k.	Equipment purchased	56.1

3. S to Z Equipment and Materials

		(% Based on Estimated Cost) %
a.	Out for bids	4.2
b.	Bids being evaluated	5.1
c.	Approved for purchasing	19.0
d.	Materials committed but not purchased	2.2
e.	Materials purchased	26.2

D). Process Engineering

Heat and Material Balances and Flows are complete, including Inert Gas and Steam Purge Connections.

E). Flow Sheets

P&I's for process and utilities have been issued. These are being revised to show additional information.

F). Plot Plans and Elevations

Plot Plans have been finished for the plant and are being changed to show relocation of equipment.

1. Outer Structure

Floor plans showing major piping have been sent to Battelle.

2. The Model of Combustor, Gasifier and associated equipment and piping has been finished.

G). Structural Steel

1. Outer Structure

The structural steel drawings have been issued to the fabricator. Information affecting column lengths have been telexed to fabricator so that he can purchase columns cut to length. Final drawings removing holds were sent February 14, 1974.

Foundation drawings have been finished and are in the process of being checked.

2. Inner Structure

The structural steel drawings have been finished and checked and are scheduled to be mailed to the fabricator March 8, 1974.

2. Inner Structure (continued)

The foundation drawings are being made. These foundations present construction problems because they are near to existing foundations. This has been discussed with Chemico's Construction Department.

H). Piping

1. Stress calculations for the hot piping has been made.

2. Battelle has approved the purchase of hot valves and purchase orders have been placed.

3. Piping plans for the various levels are in process. We estimate that 5 plans will be needed and we have started 4.

4. Nozzle orientations for the 400 section have been finished.

5. Nozzle orientations for the Combustor and Gasifier vessels have been set. Recent discussions on the fluidized flow circuit has changed the orientation on the Gasifier.

I). Instrumentation

1. P&I's have been issued and discussed with the Client as to start-up, operation and shutdown. These have been issued.

2. Panel has been ordered. It is being revised for interlocks on let-down hopper.

J). Electrical

1. One line for high voltage has been done.

2. Substation has been purchased and the layout has been done.

3. Motor Control Centers have been purchased.

4. Sketches of Elementary Diagrams for motor circuits were prepared and are ready for drafting.

5. Interlock Elementary Control Diagrams has been finalized.

K). Refractories

Requisitions for refractories have been sent to nine companies. Meetings with Battelle, Chemico and each of the companies were held. Quotations have been received from all but two companies.

L). Construction

1. Construction has not started

2. The pre-job conference was held on February 20, 1974.

F. W. Peterson

FWP:d
w/att.

COMPARATIVE COST ESTIMATE OMITTED