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TECHNICAL SECTION

of

PROGRESS REPORT NO. 13

on

CONTRACT NO. 14-32-0001-1513

to

OFFICE OF COAL RESEARCH

February 15, 1974

BATTELLE
Columbus Laboratories
505 King Avenue
Columbus, Ohio 43201

TECHNICAL SECTION

of

PROGRESS REPORT NO. 13

on

CONTRACT NO. 14-32-0001-1513

to

OFFICE OF COAL RESEARCH

from

BATTELLE
Columbus Laboratories

February 15, 1974

INTRODUCTION AND PROJECT OBJECTIVE

This progress report describes work completed by Battelle on the Coal Gasification Program during the period January 16 - February 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 a 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 vessels 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 design and procurement of equipment for the Battelle Coal Gasification PDU. Preconstruction planning is also being done by Chemico in preparation for start of field work in March.

A subcontract modification was drafted and submitted to OCR for formal approval and to Chemico for signature.

The major activity on the program in this reporting period by Battelle has been in working with the subcontractor on technical aspects related to finalizing the design and on the acquisition of PDU equipment. Attention has also continued to be given to making arrangements for acquisition of the turbine.

WORK COMPLETED

Contractual

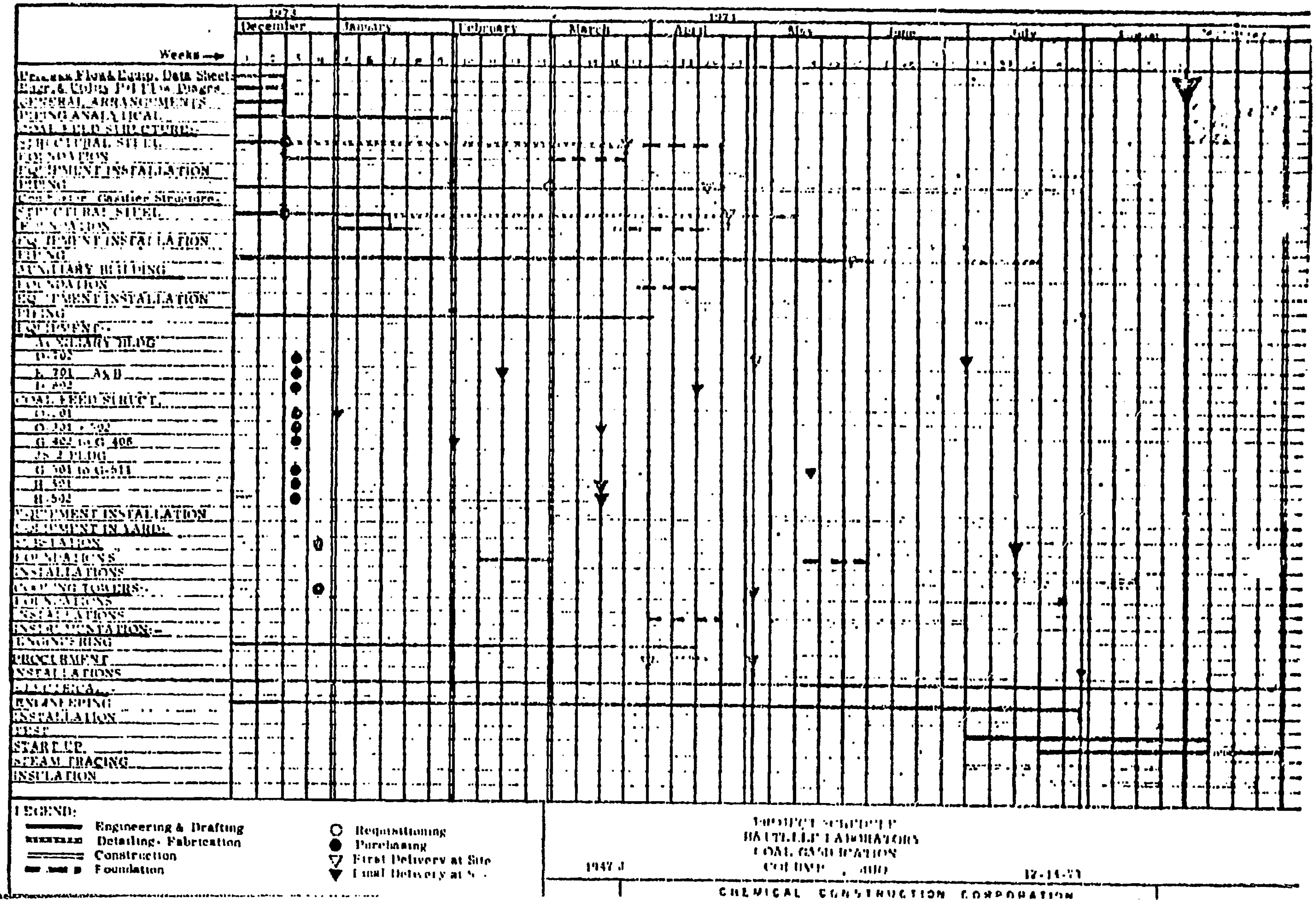
Battelle received verbal permission from OCR to increase the funding of the Chemico subcontract. A copy of the draft of subcontract Modification No. 1 was delivered to OCR on January 21 and copies were sent to Chemico for signature on January 24. At the time of this report we do not have OCR's formal approval of the subcontract modification. Neither do we have signed copies of the subcontract modification back from Chemico.

Detailed Engineering Design of the PDU

Chemico Activity

The schedule shown as Table 1 was received from Chemico on December 17. Since then we have received no notification of any changes. The PDU construction start date now planned is March 1, 1974, and PDU turnover to Battelle by September 1, 1974, is planned. Chemico is presently working on the engineering-design and procurement phases of their project directed at meeting these dates. A synthesis of information provided by Chemico's weekly reports of February 8, February 1, January 28, January 18, and their monthly report of February 10, and information obtained by our resident Project Engineer, R. R. Adams, provides the following status of scheduled activities.

Progress Flow Diagrams and Equipment Data Sheets. A number of minor modifications have been made to the process flow diagrams since their last issue in September. Chemico is continuing to check heat and material balances and make minor modifications as necessary. We are awaiting an updated set of flowsheets.



1973
1974
December
January
February
March
April
May
June
July
Weeks
Process Flow & Equip. Data Sheets
GENERAL ARRANGEMENTS
PIPING ANALYTICAL
STRUCTURAL STEEL
EQUIPMENT INSTALLATION
PIPING
Gasifier Structure
STRUCTURAL STEEL
EQUIPMENT INSTALLATION
PIPING
AUXILIARY BUILDING
FOUNDATION
EQUIPMENT INSTALLATION
PIPING
EQUIPMENT
E 701 A & B
COAL FEED STRUCT.
G 402 to G 406
G 501 to G-511
H 502
EQUIPMENT INSTALLATION
EQUIPMENT IN YARD
FOUNDATIONS
INSTALLATIONS
COOLING TOWERS
INSTALLATIONS
INSTRUMENTATION
ENGINEERING
PROCUREMENT
INSTALLATIONS
ENGINEERING
INSTALLATION
START UP
STEAM TRACING
INSULATION
LEGEND:
Engineering & Drafting
Detailing - Fabrication
Construction
Foundation
Requisitioning
Purchasing
First Delivery at Site
Final Delivery at S...
PROJECT SCHEDULE
BATTELLE LABORATORY
COAL GASIFICATION
COLUMBUS, OHIO
1947 J
12-14-73
CHEMICAL CONSTRUCTION CORPORATION

• Process and Utility P & I's. We have received updated revisions of the process P & I's from Chemico periodically. Schematic flow diagrams of some of the utility sections of the PDU have also been reviewed at Battelle. We are uncertain of when Chemico intends to issue "final" drawings for approval. However, since minor modifications are still being made to control systems and to the utility sections it is not of major concern to us to have the "final drawings at this time.

• Requisitions and Purchases. Table 2 provides Battelle's summary of the status of procurement of the major items of process equipment. It is estimated that 44 percent of the items of process equipment have been fully approved for purchase and 7 percent of the equipment has not been requisitioned. The percentage of the process equipment approved for purchase has remained the same as in our previous monthly report. However, several pieces of equipment have been added to the "total Items" column with the result that, while a number of new approvals were made, the percentage remained unchanged. The percentage of equipment not requisitioned has improved this month falling from 13 percent to 7 percent.

TABLE 2. MAJOR PROCESS EQUIPMENT ITEMS STATUS SUMMARY

Process Area[a]	Total Items	Not Requisitioned	Requisitions Out	Purchase Approved
100	5	0	4	1
200	11	0	3	8
300	10	1	6	3
400	10	0	2	8
500	19	2	12	5
600	17	5	8	4
700	8	0	3	5
800	11	0	9	2
Misc[b]	19	0	7	12
	110	8	54	48

(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.

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

Table 2 and the listing of Table A-1 represent about 75 percent of the expected PDU requisitions.

• General Arrangement Drawings. The general arrangement drawings are still being modified and updated at Chemico as they receive more detailed information on purchased equipment. The basic plot plan is not changing, however, arrangement on certain platforms is requiring modification. This work was scheduled to have been completed in mid-December. We do not presently know Chemico's intended completion date.

• Piping Analytical. We are informed by Chemico that stress and other calculations for hot piping are completed and that specifications for expansion joints are being written. The purchase of various hot valves for solids flow control was approved in late January and we presume that Chemico has written purchase orders for them. We have been informed by Chemico that the nozzle orientations for the feed lock hoppers of Section 400 have all been determined and we presume submitted to the vessel fabricator.

• Structural Steel. There are two major structures in the PDU: an "outer structure" which contains the feed hoppers and equipment auxiliary to operating the burner and gasifier vessels located in the "inner structure". Engineering of the outer structure by Chemico is more advanced than is that of the inner structure.

We have been informed for some time now that Chemico submitted structural steel drawings of the outer structure to the fabricator. These have not been considered "final" drawings by Chemico and we are informed the "finals" were sent on February 13. Early in this month Chemico Telexed column lengths to the fabricator so he could proceed with obtaining columns cut to length.

Chemico has informed us that the structural steel drawings for the inner structure are completed within Chemico and are being checked there. We do not know to what extent the fabricator has been informed regarding the inner structure design.

Because structural steel drawings for the outer structure were scheduled to have been completed in mid-December and those for the inner

structure in early January this activity is behind schedule. We have been informed by Chemico that they are experiencing difficulty in obtaining steel deliveries on other projects. Implicit in this experience is the liklihood that they will have difficulty on the coal gasification PDU.

- Foundations. Foundation drawings for the outer structure are said to be complete and, for the inner structure, they are not. Drawings for neither are available for our review yet. Since foundation drawings were scheduled for completion by mid-January. We must presume this work is also behind schedule.

- Electrical. Bids for motor control centers have been received by Chemico and their recommendation has been made to Battelle. We presently are reviewing the bids in order to recommend the purchase to OCR/AGA.

- Equipment Deliveries. Chemico has been informed by Williams Patent Crusher and Pulverizer Company that the mill is ready for delivery. As yet there is no Chemico representative at the site to receive the equipment so Williams has been asked to delay delivery. The engineering-specialist at Chemico on this type of equipment has inspected the mill. We plan for Mr. B. P. Faulkner of Battelle's Minerals and Metallurgical Processing Section to inspect the mill also prior to its shipment.

- Construction. Construction work by Chemico at the site has not started. A preconstruction meeting between members of Chemico's construction group and the Battelle Plant and Facilities Department was held in Columbus on January 29. This meeting established the ground rules for the joint Battelle-Chemico* work at the site in preparation for Chemico's meetings with local trade unions.

Meetings between Chemico and the business representatives of the trade unions are to be heid in Columbus on February 20.

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*Battelle must provide construction utilities, etc., as well as certain site modifications.

Battelle Activity Directly Related to Detailed Design of the PDU

Major activity by Battelle related to the PDU design has concerned examination of bids and bid analyses transmitted by Chemico to Battelle, analysis of Chemico's equipment specifications contained in their requisitions, and review of various engineering drawings with Chemico. Also Battelle and consultants have met with Chemico for purposes of finalizing the design of solids circulation systems.

Administratively, Bob Adams has continued in residence at Chemico's offices for purposes of expediting approvals, expediting interchange of technical information, and generally monitoring the subcontractor's activities. Increasing attention has been given by Mr. Adams to coordinating the activities of Chemico and Battelle's Plant and Facilities Department.

T. L. Tewksbury, Battelle's Supervisor of Operations for the PDU, has devoted a significant amount of time to reviews of the operability and safety aspects of the plant. In this activity he has taken advantage of a safety manual provided by the personnel at the CO_2 Acceptor Process Pilot Plant and is working closely with Battelle's Safety office.

Site modification activities by Battelle's Plant Facilities Department are progressing. Drawings for a building to house auxiliary equipment (building to be provided by Battelle) are ready for submission for bids. We have been told informally that our request for permission to operate at the site has been approved by the Ohio EPA. We do not have, however, formal notification of this yet.

In our previous monthly reports we have described the status of our inquiries to companies capable of supplying the gas turbine for the PDU. Discussions with some of the companies responding to our inquiry were continued with GE, AiResearch and Elliott by Mr. R. O. Fischer of Battelle's Thermal and Mechanical Energy Systems Section. It is expected that within the next 4 to 6 weeks we will be in a position to select a turbine supplier.

PROBLEMS AND RECOMMENDATIONS

Items of continuing concern are those related to administrative aspects of the program as are indicated in the Financial and Administrative Section of this report.

A potential problem is developing regarding our ability to obtain adequate natural gas for the PDU operation. First and even subsequent conversations with the local gas company lead us to believe the increased gas requirement at the site because of the PDU installation would not be a problem. Very recently we have been advised by the Gas Company that, because of the ruling of the Ohio Public Utilities Commission (PUCO) that new industrial consumers could not be supplied with natural gas, they cannot make an exception in our case. Our next action will be to pursue this with the Ohio PUCO.

WORK PLAN AND SCHEDULE

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

At present we believe Chemico is behind on the schedule presented in Table 1. We have no formal notification of this however. Further delays of the PDU completion obviously will have a major effect on the overall schedule. Chemico is scheduled to begin field work within the forthcoming reporting period. Also, during the forthcoming reporting period, we hope to have a clearer definition regarding installation of the turbine. We are working on an updated overall program schedule which we plan to be in a position to present at the AGA Industries Advisor's - Committee meeting with us and Chemico in New York on March 13. Our goal is still to demonstrate basic process operability by mid-1975.

APPENDIX

DETAILED STATUS OF EQUIPMENT PROCUREMENT

APPENDIX

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
C-201	Coal Pulverizer	3
P-203	Cyclone Separator	3
P-203	Bag Filter	3
P-204	Vibrating Screen	19
C-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
C-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)

Equipment Item Number	Name	OCR/AGA Authorization Sheet Serial Number
G-701A&B	Process Air Receivers	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-803	Steam Superheater	12
	• 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-802	Package Steam Boiler	20
R-803	Cooling Tower and Erection	28

3. Initial bids or revised bids have been received on the following items by Chemico. They are currently evaluating the bids and will transmit their recommendations to us very soon.

V-100 Motor Control Centers

TABLE A-1. (Cont)

D-602	Combustor Furnace With Stack
R-804	Water Treatment System (Cooling Tower) • Restrictor Valves

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
H-301	Coal Pretreater
R-301	Pretreater Venturi Scrubber
P-302	Pretreated Coal Bag Filter
K-303	Pretreated Coal Blower
RV-401	Rotary Valve
RV-402	Rotary Valve
D-501	Start-Up (and Pretreater) Heater
H-501	Combustor Refractories
H-502	Gasifier Refractories
G-501	Combustor Cyclone Receiving Hopper
G-502	Combustor Cyclone Let-Down Hopper
G-503	Gasifier Cyclone Receiving Hopper
G-504	Gasifier Cyclone Let-Down Hopper
G-505	Char Receiving Hopper
G-506	Char Let-Down Hopper
G-509	Gasifier Ash Let-Down Hopper
G-510	Combustor Ash Let-Down Hopper
G-511	Cooler Conveyor Receiving Hopper
E-605	Recycle Make Gas Aftercooler
R-601	Flue Gas Venturi Scrubber
R-602	Make Gas Venturi Scrubber
K-604	Combustion Air Blower
J-801A&B	Boiler Feedwater Pumps
G-801	Deaerator
R-801	Boiler Feedwater Treatment System
A-190	Reinforcing Bars
U-030	Annunciators
U-041	Receivers • Radiation-Type Density Gages and Level Switches • Pinch Valves

TABLE A-1. (Cont)

V-802	Emergency Electrical Generator

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

P-304	Gas Separator
K-501	Start-Up Recycle Blower
K-603	Recycle Make Gas Booster Compressor
P-601	Gas Separator
P-602	Gas Separator
E-703	Instrument Air Aftercooler
G-703	Instrument Air Receiver
K-703A&B	Natural Gas Booster Compressors
J-802A&B	High-Pressure Water Storage Tank Pumps
J-803A&B	Cooling Tower Water Pumps
J-804A&B	Valve Cooling Water Pumps

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
P-603	Prefilter
P-604	Afterfilter
R-605	Gas Dryer Package

FINANCIAL AND ADMINISTRATIVE SECTION

of

PROGRESS REPORT NO. 13

on

CONTRACT NO. 14-32-0001-1513

to

OFFICE OF COAL RESEARCH

February 15, 1974

BATTELLE
Columbus Laboratories
505 King Avenue
Columbus, Ohio 43201

FINANCIAL AND ADMINISTRATIVE SECTION

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from

BATTELLE
Columbus Laboratories

February 15, 1974

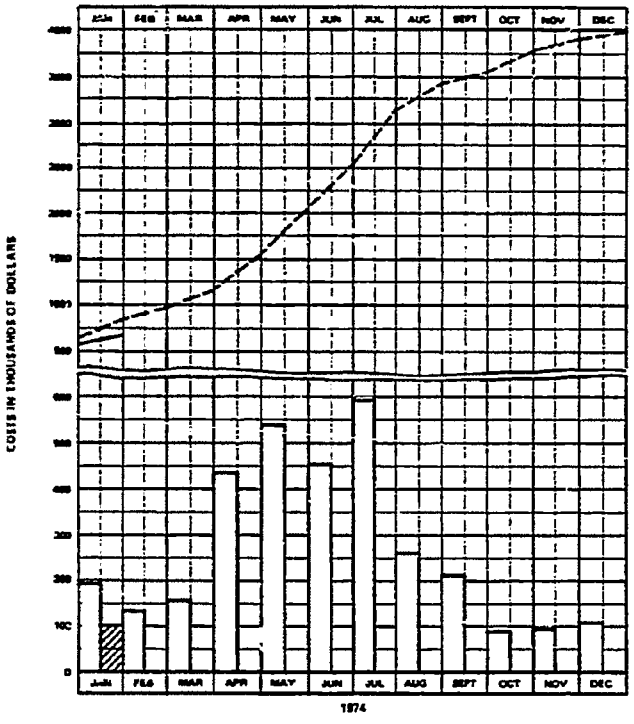
Table B-1 presents the Task Cost and Manpower Projection form for the month ending January 31, 1973. Billings have been received from Chemico for New York operating costs through November and their fee for the period through December 15. No more-current billings have been received to date. Total actual disbursements to Chemico are $353,997.03.

As shown in the attached monthly report of Chemico, they estimate their December billing will be $52,000; that for January will be $60,000, and for February $260,000. The total for the 3 months ($372,000) is not included in Table B-1. It is estimated that, as of February 1, a total of about $466,000 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 $762,000 (approximately) to suppliers of equipment for the PDU. They have, as indicated in their appended report, committed $719,000 of this.

The cumulative expenditures of Battelle, including payments to Chemico to date are about $685,000, as shown on Table B-1. The sum of actual expenditures to date, estimated billings for December and January by Chemico, and equipment purchase order authorizations is about $1,559,000 or 38.0 percent of the current 4.1 million dollar contract funding. The percentage of the present OCR* encumbered funds either spent or committed is about 46.7 percent.

*We have documents indicating funds of $3,370,000 encumbered for the program.

TABLE B-2
BATTELLE PDU
TASK COST AND MANPOWER PROJECTIONS
MONTH ENDING JANUARY 31, 1974



MANPOWER (MAN MONTHS)

Pred.	6.0	6.0	6.0	6.0	6.5	6.5	8.0	8.0	11	11	13	15
Act.	4.3											

DIRECT LABOR & OVERHEAD COSTS (THOUSANDS OF DOLLARS)

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

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

Pred.	189	115	128	404	504	422	556	221	145	7	0	0
Act.	77.9											

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

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

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

Pred.	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											

TOTAL (THOUSANDS OF DOLLARS)[4]

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

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 FEE

On page 2 of the attached Chemico report, Chemico has informed us that the predicted total cost of the PDU subcontract is now $3,445,000. In the last Chemico monthly report, the cost was predicted as $3,241,000 and a projection of estimated costs received by letter dated January 28 was $3,216,165. These estimates of an increase beyond the $3,143,000 sub-contract modification are attributed by Chemico to revisions made to unapproved drawings (termed by Chemico "Engineering Change Orders" or "E.C.O.'s"). This latest cost projection is approximately 10 percent above the present sub-contract modification. We have requested clarification from Chemico on the projected increase in the job estimate.

Chemico has not confirmed the construction start date of March 1 as planned in their status report. However, the site is adequately prepared for start of the construction activity on March 1.

Battelle continues to have difficulty in receiving information from Chemico in sufficient depth to properly evaluate the status of the sub-contract. Our specific concerns in that regard were transmitted to Mr. John Clarke in a letter from our Mr. Roger Evans dated February 11, 1974.

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

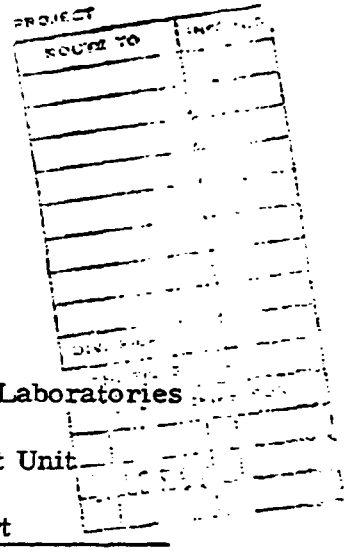
*Only staff who devote significant portions of their time to the program are listed. Various others have temporary assignments.

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: CHEMICONST. N. Y.

February 8, 1974



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

Letter No. CB-141
Contract 1947J
Re: Battelle's Columbus Laboratories
Coal Gasification
Process Development Unit

Monthly Status Report

Dear Bill:

We are sending you one copy of our Status Report dated February 8, 1974.

Very truly yours,

Fritz W. Peterson
Assistant Manager Operations

FWP:d
w/attachments

Comparative Cost Statement
Period Ending 1/28/74

JOB 1947

BATTELLE'S COLUMBUS LABORATORIES

COAL GASIFICATION PDU

STATUS AS OF FEBRUARY 8, 1974

A). Overall Status

Chemico received from Battelle Modification No. 1, changing the contract cost from $1,870,000 to $3,143,000. The Modification is under review.

The compressor and the grinders are ready for shipment.

Chemico has had delivery slippages of structural steel on other projects. When the steel situation on this project has firmed-up, Chemico will evaluate the steel delivery on this project.

B). Financial Status

Purchase Orders and Letters of Intent	$	719,068.00
Billings up to December 20, 1973		353,997.03
Estimated Billing for December		52,000.00
Estimated Billing for January		60,000.00
Estimated Billing for February		260,000.00
Total	$	1,445,065.03

Please note that we changed Purchase Orders from $731,726 to $719,068. The reason for the change is that we changed the basis on some items. For example; Instruments which are being purchased on a unit price basis were carried on the estimate of $47,217, to date we have bought $32,417 of instruments and we have reduced the purchase order accordingly.

B). Financial Status (continued)

Attached is the Comparative Cost Report for the Period Ending January 2°, 1974, showing a Predicted Total Cost of $3,445,000. 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.

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	2.8
b. Requisitions being prepared	0.0
c. Requisitions being reviewed or revised	3.0
d. Approved Requisitions being processed	.8
e. Requisitions out for bids	25.2
f. Quotes being evaluated by Engineering	7.9
g. Evaluations under Project review	0.0
h. Recommendations submitted to BCL	2.5
i. Approved for purchase or letter of intent	0.0
j. Equipment commited but not purchased	3.3
k. Equipment purchased	54.5

3. S to Z Equipment and Materials

	(% Based on Estimated Cost) %
a. Out for bids	4.5
b. Bids being evaluated	2.2
c. Approved for purchasing	19.9
d. Materials committed but not purchased	7.0
e. Materials purchased	25.4

D). Process Engineering

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

Process Flow Diagrams have been revised and the revisions are being checked.

E). Flow Sheets

P&I's for process and utilities have been issued.

F). Plot Plans and Elevations

Preliminary Plot Plans have been finished for the plant.

1. Outer Structure

The upper floors have been revised as to purchased equipment; the second floor is under revision, and the first floor will be started soon.

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 will be sent February 13, 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 are being checked.

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. Requisitions for expansion joints are being written.

2. Battelle has approved the purchase of hot valves.

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.

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.

Battelle has suggested certain changes which are being incorporated.

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 bids have been received and sent to Battelle.

K). Refractories

Requisitions for refractories have been sent to nine companies. Meetings with Battelle, Chemico and each of the companies has been held.

L). Construction

1. Construction has not started

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

F. W. Peterson

FWP:d
w/att.

NOTE:

CHEMICO'S COMPARATIVE COST STATEMENT

NOT INCLUDED IN THIS REPORT