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PIPELINE GAS DEMONSTRATION PLANT
PHASE I

QUARTERLY TECHNICAL PROGRESS REPORT
FOR
JUNE 1980 - AUGUST 1980

ROBERT J. EBY

September 1980

Work Performed Under Contract EF-77-C-01-2012

ILLINOIS COAL GASIFICATION GROUP
Room 3734
55 E. Monroe Street
Chicago, Illinois 60603

U. S. DEPARTMENT OF ENERGY

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PREPARED FOR THE
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LIST OF ACRONYMS

API	- American Petroleum Institute
CCD	- Conceptual Commercial Plant Design Report
CCP	- Cost Change Proposal
CDC	- COGAS Development Company
CE	- U.S. Army Corps of Engineers
COED	- Char Oil Energy Development
CURL	- Coal Utilisation Research Laboratory (Leatherhead, England)
C&W	- Crawford & Whiteside
DOE	- U.S. Department of Energy
DPDA	- Demonstration Plant Design Analysis Report
DPPD	- Demonstration Plant Process Design Report
EA	- Econergy Associates
ECP	- Engineering Change Proposal
EIS	- Environmental Impact Statement
EPA	- Environmental Protection Agency
EVT	- Energie-und Verfahrenstechnik GmbH
FGO	- Flue Gas Oxidizer
FMC	- FMC Corporation
FMEA	- Failure Mode and Effects Analysis
G&H	- Gibbs and Hill
HRI	- Hydrocarbon Research, Inc.
ICGG	- Illinois Coal Gasification Group
METC	- Morgantown Energy Technology Center
MOUND	- Mound Laboratory - Monsanto Research Corporation
MSS/DSS	- Material Status System/Document Status System
ORNL	- Oak Ridge National Laboratory
Parsons	- The Ralph M. Parsons Company
PDBP	- Process Design Baseline Package
PER	- Process Evaluation Report
PETC	- Pittsburgh Energy Technology Center
PFD	- Process Flow Diagram
P&ID	- Piping and Instrumentation Diagram
PMN	- Premanufacturing Notice
PRC	- Power Recovery Corporation
P&T	- Pressure and Temperature
PSD	- Prevention of Significant Deterioration
R/QA	- Reliability and Quality Assurance
RCRA	- Resources Conservation & Recovery Act
SARS	- Safety Analysis and Review System
SICC	- Southwestern Illinois Coal Corporation
TIC	- Technical Information Center
TSCA	- Toxic Substances Control Act
UEC	- USS Engineers and Consultants, Inc.
UOP/SDC	- Universal Oil Products/System Development Corporation

DEMONSTRATION PLANT AREAS

<u>PLANT AREA</u>	<u>DESCRIPTION</u>
201	Coal Unloading and Handling
202	Coal Preparation
203	Pyrolysis and Gasification
204A	Oil Recovery
204B	Oil Treatment
205	Gas Purification
206	Hydrogen Generation
207	Shift and Methanation
208	Bulk CO ₂ Removal and Gas Compression
209	Gas Dehydration
210	Flue Gas Power Recovery
211	SO ₂ Removal
212	Sulfur Recovery
213	Ammonia Recovery
214	Thermal Oxidizer and Flare
215	Utilities
216	Water Supply
217	Water Treatment Systems
218	Waste Treatment and Disposal
219	Fire Protection System
220	Facilities

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ABSTRACT

Work performed in the following tasks in Phase I of the Pipeline Gas Demonstration Plant Program.

- Task II - Demonstration Plant Process Design
- Task III - Site Evaluation and Selection
- Task IV - Demonstration Plant Environmental Analysis
- Task V - Feedstock Plans, Licenses, Permits and Easements
- Task VI - Demonstration Plant Definitive Design
- Task VIII - Economic Reassessment
- Task IX - Technical Support
- Task X - Long Lead Procurement List
- Task XI - Project Management

During this past quarter, the following Task XI Major Contract Deliverables were submitted to the Government:

- Process Evaluation Report - TIC Version
- Conceptual Commercial Plant Design Report - TIC Version
- Demonstration Plant Design Analysis Report - TIC Version
- Demonstration Plant Process Design Report
- Site Master Plan
- Prevention of Significant Deterioration Documentation

The major work activity has been the effort in Task VI, Demonstration Plant Definitive Design, which commenced following the completion of the Process Design Baseline Packages for the fourteen Demonstration Plant process areas. Task VIII, "Economic Reassessment" was opened in this quarter. Completion of the TIC copies of the ICGG major deliverables constituted a significant effort in this period.

Work has progressed satisfactorily in the other Tasks in support of the Demonstration Plant Program.

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OBJECTIVE AND SCOPE OF WORK

The major objective of the ICGG Pipeline Gas Demonstration Plant Program is to demonstrate the commercial feasibility and economic attractiveness of a chemical process for conversion of high sulfur coal to clean pipeline gas. The comprehensive program includes the following specific objectives:

- To engineer, design, construct, operate and manage an integrated synthetic pipeline gas demonstration plant.
- To confirm design criteria, demonstrate technology and obtain experience which will yield those characteristics required to establish and/or define plant investment and operating costs for future clean pipeline gas commercial production plants.
- To project plant investment, operating and end-product costs for full-scale commercial production plants.
- To provide technology, performance, reliability and maintenance characteristics which will permit the design of a full-scale clean pipeline gas commercial production facility.
- To investigate the general applicability and limits of the selected process and plant design for a variety of coal types.
- To determine scaling parameters (with respect to the commercial production of the primary product) and sizing of major process components, such as those for gasification, hydrogenation, etc.
- To provide finished marketable clean pipeline gas in quantities sufficient for end-use evaluations.

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- To determine the general characteristics, composition and quality of the end-product(s).
- To assess and/or evaluate characteristics and suitability of the product in actual representative end-use applications.
- To establish guidelines for by-product use and/or disposal.
- To obtain data which will permit design of an environmentally acceptable commercial plant.
- To establish the design compatibility with Occupational Safety and Health Administration requirements.

ICGG will supply personnel, equipment, facilities, material and other services necessary to perform the work which has been divided into three distinct Phases. These are:

Phase I - Development and Engineering

- Stage 1 Conceptual Design
- Stage 2 Final Engineering Design

Phase II - Demonstration Plant Construction

Phase III - Demonstration Plant Test, Evaluation and Operation

The following provides a brief description, by Phase, of the total program.

Phase I - Development and Engineering

Stage 1 - Conceptual Design

A conceptual design for a Commercial Plant has been prepared. The design is based on the maximum use of proven, commercially-available components and equipment. The capital and operating cost estimates, as well as the economic analysis, have considered various process trade-off and design studies. Based upon this conceptual design for a Commercial Plant, a conceptual process design for the Demonstration Plant was developed. A site evaluation study and an environmental analysis, as well as preliminary plans for resources (coal, water, etc.) and water pipeline right-of-way acquisition, were also prepared. A design analysis for the Demonstration Plant was also submitted to DOE at the end of Stage 1.

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Stage 2 - Final Engineering Design

During Stage 2, bid packages, construction plans and an economic reassessment will be prepared. In addition to the possible procurement of long lead time equipment, plans for procuring raw materials, permits and easements will be finalized.

Before proceeding with Phase II, DOE and ICGG must mutually agree that the program should continue.

Phase II - Demonstration Plant Construction

Phase II encompasses the actual construction of the Demonstration Plant. ICGG will finalize the site acquisition and agreements related to feedstocks, product transportation, by-products sale, wastes, permits, licenses, easements and rights-of-way. After competitive bidding, the construction sub-contract(s) will be awarded. ICGG will be responsible for procurement of equipment and facilities, preparation of the site, inspection of the work, and construction management.

Operation, training and maintenance manuals required for the start-up, testing and operating during Phase III will be developed. Training programs will be implemented with the specific objective of developing the necessary skills required for the operation and maintenance of the Demonstration Plant. The training program will emphasize both the safety features and the hazards of the equipment. A final economic reassessment of the investment and the operating costs of both the Demonstration Plant and a Commercial Plant will be performed.

Updated "as-built" drawings will be submitted to DOE. After the approval by DOE of a check-out and acceptance plan, ICGG will perform necessary mechanical testing of the plant prior to start-up.

Phase III - Demonstration Plant Test, Evaluation and Operation

A plant shakedown test plan will be submitted to DOE for approval before ICGG tests the plant components. A detailed report summarizing the six months of testing will be submitted to DOE. Two months are planned for establishing the operating conditions and operating variables for the primary coal type, after which

the plant will be operated for twelve months to demonstrate the long term operating characteristics of the plant. At the conclusion of the testing of the primary coal type, DOE may direct ICGG to test one or both of the alternate coals for a period of six months each. At the end of Phase III, DOE has the option to extend the period of performance for a period not to exceed eighteen months in accordance with terms and conditions mutually agreed upon by ICGG and DOE.

As a result of the experience gained from constructing and operating the Demonstration Plant, ICGG will conduct process trade-off studies and an economic reanalysis for the optimization of the design, construction and operation of a commercial plant.

DETAILED DESCRIPTION OF TECHNICAL PROGRESS

1.2 Demonstration Plant Process Design

Work Accomplished

Dravo Demonstration Plant Process Design Report

The DPPD, minus Section 3 (Demonstration Plant Area Descriptions), was delivered to ICGG. The Demonstration Plant Area Descriptions had been prepared and issued by Dravo for final ICGG review in all plant areas with the exception of Areas 203 and 204. Based on the PDBP Record Document submitted by Dravo to ICGG in May, DPPD Subsection 3.3 was revised, updated, printed and issued for final ICGG review on June 18, 1980. DPPD Subsection 3.4 was issued, in turn, on June 20, 1980. This completed the information required by ICGG for publication of the DPPD Report.

Process Design Baseline Packages

The final PDBP in preparation, that for Area 213, was prepared based on the incorporation of UEC's Detailed Process Design Package. UEC's initial package, which was submitted as the nonproprietary Preliminary Process Design Report in December 1979, was used to prepare the nonproprietary PDBP and DPPD Subsection 3.13. Only the nonproprietary process description, PFD's and energy balances were issued to ICGG for publication in the DPPD.

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On July 10, 1980, a Baseline Review Meeting was held with representatives from DOE, UOP/SDC and ICGG at the Dravo office in Pittsburgh, PA, to discuss the Area 213 PDBP. Based on comments from this meeting, Dravo updated and revised the baseline documents. On August 13, 1980, the Record PDBP for Area 213 was then issued to ICGG for publication to authorized members of the government team. A meeting was later held on August 15, 1980, with representatives from ICGG and UEC at the UEC office in Monroeville, PA, to discuss questions raised by DOE at the Baseline Review Meeting.

During the week of July 14, 1980, the Task II work in progress on revision of the Area 213 PDBP was redefined as a Task VI item.

CDC Reviewed and issued memoranda to Dravo commenting on nonproprietary versions of the PER, CCD, DPDA and DPPD. Preparation of nonproprietary PFD's and input-output material balances for use in these reports was completed. Sections 3.2, 3.3, 3.4 and 3.10 of the DPPD were checked to determine if earlier CDC technical recommendations on the process baseline design were incorporated, and memoranda were issued commenting on each section.

Results of the Mogenson coal sizer test were reviewed. This is an alternate multiple screen system proposed by Dravo. A memorandum was issued reporting CDC's review of the data, which indicated that the unit met process requirements.

Participated with ICGG and Dravo in a meeting at METC in which the METC valve development program was reviewed. METC concluded that COGAS Process Lock Hopper Valves should present no problem because of low temperature and pressure conditions. METC also concurred in the design approach for the high temperature char circulation control valve.

Buell was contacted regarding their experience with refractory lined cyclones and tertiary separators and their comments were subsequently reported by memorandum.

A memorandum was issued to Dravo in response to these questions concerning char accumulation around pyrolyzer manways after shutdown. A temperature at which the pyrolyzers can be opened without posing a fire hazard was recommended.

Revised Pyrolyzer E sketches accommodating changes in distributor details were transmitted by memorandum.

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A memorandum was issued describing COED scrubber pump specifications in response to questions raised by UOP/SDC during the Area 204A Baseline Design review meeting of May 22, 1980.

A response to questions raised by Starr Technical Risks Agency concerning the FGO Control and Safety System requirements was issued. These questions were discussed in further detail at an Area 210 P&ID review meeting with Dravo and PRC on June 25-26, 1980. A follow-up meeting held with Starr is reported under Task VI.

A review was made of baseline design packages for downstream plant Area Nos. 214, 219 and 220 and memoranda summarizing comments and questions were issued.

1.3 Site Evaluation and Selection

Work Accomplished

ICGG The Dames & Moore's draft report on the Segment II Geotechnical Investigation (including Dynamic Consolidation) was reviewed and comments were discussed by ICGG, Dravo, G&H, Dames & Moore and CE representatives in a meeting in Pittsburgh on June 3, 1980. The report recommends use of Dynamic Consolidation to improve the soil at the site, making it possible to support settlement-sensitive structures on spread foundations. The final soils report for the Demonstration Plant site was then completed and a copy transmitted to CE during August 1980.

The Site Master Plan Report was completed and submitted to DOE on July 21, 1980.

A purchase order was placed with the J. D. Turner Construction Company for a Transportation Survey Report of the route from the Demonstration Plant site to suitable barge unloading facilities at the Mississippi River. This survey got underway during the last week of July 1980.

During August 1980, ICGG and C&W gathered data in the site vicinity for highway and waterway crossing permits for the water pipeline.

Dravo Site Master Plan Report (Dravo)

The Site Master Plan Report was submitted to ICGG on July 11, 1980. The report delineates (1) the location of the Demonstration Plant within the site, (2) access

to the site during construction and operation, (3) areas to be used by the construction contractor for storage, temporary offices, etc., and (4) availability of utilities during construction and operation. The Site Master Plan was prepared by Dravo in conjunction with ICGG and G&H. Periodic review meetings were held to discuss the scope, progress and content of this report. Support data was provided by G&H for Dravo to cover topographical data, soils conditions, climate information and available transportation facilities.

Segment II Geotechnical Investigation (G&H)

On June 3, 1980, representatives from CE, ICGG, Dames & Moore, Dravo and G&H met at the Dravo office in Pittsburgh, PA, to review Dames & Moore's final draft of the Segment II Geotechnical Investigation Report. Dames & Moore incorporated the comments from this meeting into the draft, and on June 24 issued revised pages for ICGG, G&H and Dravo to review prior to inclusion in the report. These final revisions were incorporated by Dames & Moore, thereby completing preparation of the text, tables and figures for the record document. On August 1, 1980, Dames & Moore submitted the Segment II Geotechnical Investigation Report, composed of Volumes I and II, to Dravo for distribution to DOE, CE, ORNL, UOP/SDC, ICGG and G&H. A summary of the report's conclusions is as follows:

- The unimproved mine spoil at the site is very compressible, has extremely variable properties within relatively short distances, and is not suitable for support of settlement-sensitive structures.
- It is recommended that the site be improved by utilizing dynamic consolidation, and that heavy dynamic consolidation be performed for all major, settlement-sensitive structures and facilities. Lighter dynamic consolidation will be required for structures and facilities, such as impoundment structures and buildings relatively insensitive to settlement; and may be needed along underground utility corridors, roads and railroads.
- Static settlements for structures supported on improved spoil will be relatively uniform. Approximately 70 to 80 percent of the calculated settlement will occur during construction and initial load application.

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- Seismic settlements should be minimal after improvement.
- The spoil material can be utilized in conventional earthwork operation; however, cobble and boulder size materials will have to be removed prior to completion.

River Intake Geotechnical Investigations (G&H)

Work was initiated on preparation of the specifications for the geotechnical field studies at the river intake.

Work Forecast

- ICGG The transportation survey report of potential routes from the river to the site will be completed. The information will be used in Construction Planning.
- Dravo
(G&H) Initiate procurement of services for the proposed geotechnical investigations for design of the river water intake lift station, raw water booster pump house, and the railroad spur connecting the plant with the existing Illinois Central Gulf Railroad line.

A lower-tier subcontract for an additional Geotechnical Investigation at the River Water Lift Station and Booster Station site, as well as on the future railroad spur to the Demonstration Plant, will be placed with a local contractor in the site locale.

1.4 Demonstration Plant Environmental Analysis

Work Accomplished

- Dravo
(G&H) Environmental Impact Statement
- Received and reviewed the Draft EIS prepared by ORNL. Comments on this draft were then prepared and submitted to ORNL for use in preparing the final report.

Environmental

Responded to DOE's questions regarding the absence of endangered species of bats in the site area.

Hydrology

Received groundwater levels and precipitation data from ICGG and reviewed this data relative to the site environs for the month of June through August 1980.

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This data will be incorporated into the hydrographs being prepared to show monthly hydrological trends from November 1977 to the present.

Work Forecast

Dravo Continue preparation of hydrographs depicting site (G&H) hydrological information.

1.5 Feedstock Plans, Licenses, Permits and Easements

Work Accomplished

ICGG The PSD Permit Application was submitted to the Illinois EPA on July 14, 1980. An exact duplicate of the application, with a different cover and title page, was submitted to DOE on July 18, 1980 titled "PSD Permit Application Documentation."

Revisions to the PSD Permit Application in the form of Errata Sheets, were submitted to the Illinois EPA and to DOE during August 1980.

Copies of subsections 3.1.1, 3.1.10, 3.1.11 and 3.1.12 of the DPPD, in nonproprietary form were given to the Illinois EPA during August 1980, as a reference for use while working on the various Demonstration Plant construction permits which fall under the Coordinated Permit Review Procedure.

Dravo Premanufacturing Notice Forms
(G&H)

Representatives from ICGG, CDC, FMC and G&H met concerning the approach to be used in preparing the PMN Forms for the United States EPA. It was determined that separate applications will be prepared for the No. 2 fuel oil, No. 6 fuel oil and naphtha.

PSD Permit Application (G&H/Dravo)

Dravo assisted G&H in their permits and licensing effort by providing information for use in preparing the PSD Permit Application entitled "Application to the Illinois Environmental Protection Agency for a Permit for Prevention of Significant Deterioration of Air Quality." Copies of the application were submitted to ICGG and DOE.

A total of 36 computer runs were made using the CRSTER model for criteria pollutants (i.e., SO₂, TSP, NO₂, CO and hydrocarbons). These runs were analyzed and the results were incorporated into the Section 8 write-up, "Impact on Air Quality," for the PSD application.

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Illinois EPA Coordinated Permit Review (G&H)

Cost estimates and Optional Form 60's were prepared, at ICGG's request, for services required to prepare permit applications for:

- Air Pollution Control Construction Permit
- Water Pollution Control Construction Permit
- Solid Waste Development Permit

Upon authorization from ICGG, G&H and Dravo initiated work on the coordinated permit review for the Illinois EPA.

Outlines for material to be included in the Air Pollution Control Construction Permit, Water Pollution Control Construction Permit and Solid Waste Development Permit were prepared.

General

On August 19, 1980, a meeting was held at the Illinois EPA office in Springfield, IL, by representatives from ICGG, Illinois EPA, Dravo and G&H. The purpose of this meeting was to discuss the Illinois EPA's preliminary findings on the PSD Permit Application and to obtain approvals on the outlines prepared for the Water Pollution Control Construction Permit and the Solid Waste Development Permit Applications. Other highlights of this meeting included the following:

- The Illinois EPA submitted nine questions relative to the PSD Permit Application to G&H concerning emissions, computer modeling and meteorological data. A response is being prepared.
- The designs of the landfills and ponds were found to be sound and in line with RCRA. Further investigations are required for permeability, landfilling slag at Ditch B and transporting any hazardous wastes off site.

Work Forecast

ICGG Continue to work with the Illinois EPA in order to expedite approval of the PSD Permit.

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Continue to work with the Illinois EPA on the Coordinated Permit Review Procedure, which involves submission of coordinated applications for construction permits which relate to air quality, water quality and solid waste disposal during Demonstration Plant construction.

Dravo Continue to work on the coordinated permit review and (G&H) preliminary PMN Forms.

1.9 Technical Support

Work Accomplished

CDC Cold Model Data Analysis, which had been inactive, was resumed and is almost complete. A draft of the final report is being written.

The Fuller Company submitted a proposal for more testing of the Fuller-Kinyon Pump with Illinois No. 5 & 6 seam coal. The proposed study was to utilize a coarser grind and investigate possible changes in pump operations which might cause less attrition of coal in the pump. The new proposal by Fuller lacked specificity, and the outlined work differed markedly from that which was discussed at a meeting in May 1980. Fuller explained that the changes were made following internal discussions among their staff. A second meeting between Fuller and CDC representatives is being arranged to discuss Fuller's new recommendations.

Preparations continued for the Particulate Erosion Test to be conducted by Carrier Corporation. This study should confirm that the expander blade life in a COGAS Flue Gas Power Recovery System should be comparable to that of Fluid Catalytic Cracking systems. Alpine-American Company completed classification of a replacement sample of Fluid Catalyst Cracking catalyst and produced a sample of small but adequate size. The three dust samples were sent to Carrier Corporation and had 6 to 8 weight percent of material larger than 10 microns and an average particle size of between 4 and 5 microns. The dusts were analyzed by CDC for both major and minor elements, size consists, and the particle shapes were determined photographically by electron microscope. These data were transmitted to the Carrier Corporation and Carrier testing will start in early September 1980.

Efforts continued to answer DOE and United States EPA questions, and to obtain DOE approval, of the CDC proposal for a Toxicological Screening Program. This program is

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intended to provide an initial evaluation of the health effects data of oil products similar to those to be produced in the Demonstration Plant. These data can be utilized in an assessment of the degree of risk from manufacture and marketing to the population or environment. Naphtha, No. 2 fuel oil and No. 6 fuel oil from the hydrotreating of COED Pittsburgh seam coal derived oil, together with similar samples from petroleum, will be tested and compared. Acute and sub-chronic toxicity studies and mutagenicity studies will be conducted. Several petroleum samples were acquired and characterized for these studies. The coal derived oil samples were delivered to HRI and are being prepared as part of their program on bench scale hydrotreating of Pittsburgh coal derived oil.

Work Forecast

CDC Complete the Data Analysis of the Fines Feeder Cold Model Program and report the results.

Issue the report describing Fuller-Kinyon Pump tests completed to date, and submit a proposal for further testing with Illinois No. 5 & 6 coal.

Begin the Particulate Erosion Test Program in early September 1980 upon receipt of final approval from ICGG.

Conduct the Toxicological Screening Program using oil samples prepared by HRI from Pittsburgh seam coal derived oil.

1.10 Long Lead Procurement List

Work Accomplished

Dravo A letter was sent to ICGG requesting that the Power Recovery Unit (210-42102) be placed on the Long Lead Item List. This is necessary due to the increase in time, from 24 months to 49 months, estimated as required to receive a bid and design, construct and erect the unit. ICGG subsequently requested that Dravo submit a revised Long Lead Item List, which would incorporate the Power Recovery Unit. A revised list is being prepared. Dravo is currently reviewing the Long Lead List based on the revised Construction Schedule, and will issue a new list to ICGG in mid-September.

In anticipation of DOE approval of the Power Recovery Unit as a long lead item, work is in progress on developing a definitive scope of work for use in the Project Solicitation.

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The scope of work for the Combustor (203-33106) was reviewed and information required in the immediate future by the engineering design disciplines was delineated. This was done to aid ICGG in their contract negotiations with EVT, who will provide the conceptual and base engineering design for this item.

Based on a review of the Project Solicitation for the FGO (210-44101), a letter was sent to ICGG outlining those changes which would be required to Section F of Part II to permit the solicitation of a conceptual design from vendors.

Work Forecast

Dravo Issue a revised Long Lead Item List to ICGG.

Continue preparing the Power Recovery Unit process design package in conjunction with CDC.

2.6 Demonstration Plant Definitive Design

Work Accomplished

ICGG HRI responded to questions raised by MOUND, on HRI's Detailed Process Design Report prepared during Task II, in a meeting at HRI in Miami, FL, on June 19, 1980. Representatives of HRI, ICGG, Dravo and MOUND participated. To supplement the verbal responses given at the meeting, HRI prepared written responses to MOUND's questions, which were transmitted to MOUND.

HRI answered Dravo Task VI questions on Area 204B in a meeting attended by ICGG, HRI, Dravo, METC and CDC representatives on July 24, 1980 in Pittsburgh, PA. The questions involved detailed information needed by Dravo for Task VI completion, including questions on vessel lateral supports for earthquake resistance, completion of specifications for rotating equipment, pressure let-down valves, and addition of further detail to vessel drawings. Any open items not resolved at the meeting were settled through follow-up correspondence between HRI, Dravo and ICGG. These items were all specific detailed design questions, on subjects such as heat exchanger rating, blowdown and flush systems, vessel details, etc. HRI also submitted some revised vessel drawings, which corrected minor errors present in the previous version of the drawings.

The program for HRI bench-scale H-Oil[®] testing of Pittsburgh coal-derived COED oil at the HRI R&D Center began during June 1980. The first task, a 30-day continuous H-Oil[®] Reactor run, ended on July 30, 1980.

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Inspection of the Reactor System by ICGG, HRI, CDC and Dravo representatives after the 30-day continuous run revealed no sign of coking or catalyst agglomeration.

A meeting was held on July 15, 1980 in Chicago, IL, at which Parsons reviewed their designs for the Claus Plant Combustion Controls on the Reaction Furnace and Thermal Oxidizer with representatives of ICGG and ICGG's Insurance Underwriters. Agreement was reached that Parsons' designs meet the underwriters' requirements.

HRI submitted a proposal on July 31, 1980, for combined laboratory work and paper studies aimed at reducing the amount of possible carcinogens which could be present in Demonstration Plant oil products. ICGG evaluated this proposal and recommended to CE that the proposed work not be undertaken at the present time.

During July 1980, FMC completed two studies for ICGG pertaining to the effects which the high ratio of chlorides to sulfur oxides present in the Demonstration Plant flue gas has on the Area 211 system design. One study consisted of corrosion testing, which confirmed the material selections made by FMC for the Demonstration Plant. The other study investigated the effect of high chloride concentration in the scrubbing system solutions on system performance. This study confirmed that the chloride concentration present in ICGG's system is not high enough to cause adverse process effects.

On August 15, 1980, ICGG and Dravo met with UEC in Monroeville, PA, to resolve some Government comments which had remained open from the July 10, 1980 Area 213 Baseline Meeting. UEC's responses to the comments were written up in the minutes of the meeting and made available to UOP/SDC, originators of the comments.

Dravo Task VI engineering activities proceeded in development of the definitive design of the Demonstration Plant. In June, authorization was received from ICGG to begin work in Process Areas 202, 204A, 211, 212, 214 and 218. The engineering design effort in these newly initiated areas coincided with work already started for Process Areas 203, 204B, 205, 206, 207, 208, 209 and 210, and Nonprocess Areas 201, 215, 216, 217, 219 and 220. Work in progress in these areas included preparation of the final model, layout drawings and piping orthographic drawings; structural framing design and drafting, and architectural design; HVAC drawings; P&T diagrams; and one line diagrams, elementary diagrams, lighting and

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grounding diagrams, power and control conduit layouts, electrical room layouts, fire alarm/communication system plans, an equipment list and lighting fixture schedule. Work is also in progress by the respective disciplines on the development of vessel, mechanical, piping, HVAC, instrument and electrical requisitions.

The Task VI design effort continues the updating and revising, on an area by area basis, of the process descriptions, PFD's, material balance calculations, energy balances, P&ID's, process equipment specifications, process control descriptions, utility and reagent summaries, and solid waste/gaseous emissions/liquid waste characteristics. P&ID's were updated and issued as Revision 2 for Areas 201, 205, 206, 209, 210, 216 and 219.

Meetings were held with prospective vendors to discuss their equipment's design and capabilities relative to the Demonstration Plant's operation. The following list highlights the equipment items of most significance which were discussed:

- Area 202 ● Lock hopper system
 ● Screening system
 ● Coal drying system
- Area 204 ● Ebullating bed reactors
 ● Venturi scrubbers
- Area 218 ● Evaporator applications for the
 Inorganic Waste Evaporator System
 (218-47208)
 ● High purity oxygen biotreatment
 system for inorganic waste streams

Insurers' Design Review Meetings were held at the ICGG office in Chicago, IL, with ICGG and its insurance underwriters to discuss the process requirements and combustion control requirements for the FGO in Area 210 and the Claus Plant Reactor Furnace and Thermal Oxidizer in Area 212.

Procedures for preparation of instrumentation specifications were established and document requirements for instrumentation work were updated.

The basis for field wiring of alarm circuits, temperature elements and analog transmitter and control signals was established.

The development of the construction Schedule was initiated.

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A study is in progress in Area 201 of the trade-off analysis for the delivery of Illinois No. 5 & 6 coal and the rail handling logic. A comparison of the estimated annual costs was made, based on tonnage rates for truck loading at the SICC Captain Mine and revised Illinois Central Gulf Railroad rates for delivery by rail, and the conclusions were issued to ICGG. On the basis of these estimated coal delivery economics, ICGG determined that rail delivery is more economically feasible at the present time. Dravo's logic study for delivery of the Illinois coal is to be based on delivery of sixty-two, 100-ton coal cars every other day. The delivery of Pittsburgh No. 8 and Western subbituminous coals will be based on receiving seventy, 100-ton coal cars three times per week. Dravo is also investigating the switch engine size needed for rail car handling in the plant. ICGG informed Dravo that no existing rail storage tracks are available. In response to requests by ICGG, the thaw shed and car positioner were eliminated from the area's design.

As a result of Dravo's inquiries, a quote for a Venturi Impact Dryer Mill System for Area 202 was received in July from Williams Patent Crusher & Pulverizer Company, the sole source provider of this equipment. This quote proposes that the System, when regularly and uniformly fed with 1-1/2" x 0 coal of the three types proposed for use in the ICGG Demonstration Plant, i.e., Illinois No. 5 & 6, Pittsburgh No. 8 and Western subbituminous coals containing up to 11% surface moisture (28.5% total moisture), will produce a product coming from the cyclone containing 98 to 99% minus 10 mesh with a maximum of 10% minus 200 mesh generated by the Williams equipment. The production rate from the cyclone will be 125 tons per hour. The material will be simultaneously dried to remove 5% of the surface moisture of the coal. Williams claims the equipment is capable of drying the coal to 3% total moisture. In order to substantiate the viability of this System for Demonstration Plant operation, laboratory tests of the System were arranged for processing Illinois No. 5 & 6 and Western subbituminous coals. (Results of the processing of Pittsburgh No. 8 coal are expected to be similar to the processing of Illinois No. 5 & 6 coal, therefore, the Pittsburgh No. 8 coal is not being tested.) During August, representatives from ICGG, CDC, UOP/SDC and Dravo visited the Williams office in St. Louis, MO, to witness tests of the System using the Illinois coal. Additional runs will be made in September upon delivery of sufficient samples of Western subbituminous coal to allow for system testing. Pending results of the Williams tests and the decision whether

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or not to incorporate the Williams system into the plant design, work has been suspended on the preparation of Area 202 drawings and requisitions.

In response to a verbal request by ICGG, a report is being prepared to present Dravo's assessment and position regarding the structural design approach in Area 203.

As a result of work continuing on the development of refractory design for vessels and piping in Area 203, a preliminary refractory design for each of the following items has been established: Pyrolyzer E, Gasifier, Fines Feeder, Cyclones and, except for a few lines, the refractory lined process pipes. These designs were reviewed by representatives from CDC, CDC's design consultant Mr. R. W. Pfeiffer, Dravo's consultant Mr. N. Nassir, and ICGG's consultant Mr. L. Seglin. Additional work is required to confirm that the selected refractory materials will withstand the various environments found in the coal gasification system.

On July 30 & 31, 1980, representatives from ICGG, CDC and Dravo visited the HRI laboratory in Lawrenceville, NJ, to inspect the bench scale ebullating bed reactor following a 30-day run on unfiltered Pittsburgh COED oil. The purpose of this examination was to determine if the reactor, a part of the Area 204B design, had coke deposition problems.

At EA's request, Dravo checked its proposed design of a spray tower for the Cooler Contactor, a part of Venturi Scrubber II, with Croll-Reynolds, a prospective vendor for this item. As EA suggested, the spray tower could be replaced by a packed tower with some saving in circulating water pump horsepower.

A hydraulic study for the main gas flow for Area 205 was completed.

ICGG and Dravo decided to include a breakdown of the estimated design time tables for fabrication and erection in the solicitation for bids for the Area 210 FGO design. Inquiries will be submitted to three vendors to have them prepare their conceptual designs and submit estimates for fabrication. ICGG will then select one vendor to prepare the detailed design. Dravo received the completed Forms 254 and 255 from Heat Research and Deltak. On July 11, 1980, representatives from ICGG and Dravo met to determine the schedule requirement for the FGO layout data. August 15, 1980, was established as the latest date that the detailed process design data could be received. However, this deadline date could

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not be met and consequently, the decision was made to proceed with the Task VI design effort for the FGO using the 1976 B&W conceptual design data.

A preliminary tabulation of the emergency power requirements was completed for Area 215.

The steam-power balance and utility balance diagrams were updated and issued as Revision 1 for Task VI release.

The control concept for the Area 216 Booster Station Pump House was revised to include continuous pumping rather than on/off control. The PFD's and P&ID's, which were revised to reflect (1) replacement of the settling tank with a grit collection system and (2) continuous pumping vs. intermittent pumping, were issued to ICGG.

Area 216 drawings for the lift station access road were completed. Work is continuing on the plan and profile drawings depicting the routing of the water pipeline from the Mississippi River to the Plant site. Drawings for the pipeline layout and river water intake systems are also in progress.

Dravo prepared a written response to UOP/SDC's concern about the Area 215 Cooling Tower's water quality. Detailed design work on the Cooling Tower water treatment equipment was initiated.

The design of the utilities control panel was initiated in Area 217.

An investigation of the latest State of Illinois and federal government requirements for the Plant landfills was initiated in the Area 218 design effort. On August 19, 1980, representatives from ICGG, G&H and Dravo visited the Illinois EPA in Springfield, IL, to determine the regulations governing the construction of the Demonstration Plant's landfills and water basins. The Illinois EPA was informed of the type and amount of solid wastes and waters that were to be retained in the landfills and basins. Representatives from the Illinois EPA's Solid Waste and Water Pollution Control Divisions, in turn, outlined the necessary requirements and regulations pertinent to these conditions. Also discussed at the meeting were the required documents needed by the Illinois EPA for ICGG to obtain landfill and wastewater treatment facility construction permit approval.

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As a result of a comment made on the No. 2 fuel oil emissions and use of the Best Available Control Technology during the PSD Permit Application review, an investigation of the means of controlling emissions in the Tank Farm was initiated for Area 220.

Layout drawings for the Product Storage Area were approved by ICGG and issued as "Approved for Engineering."

Work was initiated on preparation of plumbing drawings for the Administration Building and orthographic piping drawings for the plant facilities. Preparation of the architectural detail design and HVAC calculations and drawings is proceeding for the Administration Building, Personnel Building, Plant Lunchroom, Laboratory and Control Room. Architectural drawings and structural drawings of the Administration Building and layouts of the Plant Lunchroom and Laboratory were issued to ICGG for approval. In conjunction with ICGG's subsequent recommendations, work was initiated on revising the main Laboratory's design requirements. An architectural layout of the Laboratory and Control Room is in progress and will be issued for ICGG's approval during the first week of September. The design of the railroad spur connecting the plant site to the Illinois Central Gulf Railroad line is in progress. Work is also proceeding on a logic study for the plant railroad.

A meeting was held with ICGG representatives at the Dravo office in Pittsburgh, PA, to review the machine tool requirements, laundry requirements, warehouse sizing, and garage equipment and vehicle servicing.

Preparation of the Hazard Specification continued.

Fundamental concepts for fire alarms, evacuation alarms, plant communication and security systems were developed and issued to ICGG for review. Following review of ICGG's comments, Dravo began preparing a formal response.

The Plot Plan, developed as a Subtask 2.6.21 function, was approved by ICGG and issued as "Approved for Engineering." Work was initiated on preparation of enlarged Plot Plan drawings, with coordinates being set for each area.

Work was initiated on preparation of specifications for the Data Logger, vent header sizing for the flare system, and a study of the underground pressure piping and yard service racks.

Guidelines for the Control Center layout were established to permit the building to be defined in the near future.

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The development of design engineering specifications, standard detail drawings, the equipment list and lighting fixture schedule continued.

CDC At a Design Review Meeting held August 6 and 7, 1980 at the Dravo office in Pittsburgh, PA, presentations were made to the government team covering process descriptions, simplified process flow diagrams, key equipment, and primary controls for areas 203, 204A and 210. Answers to questions raised by the government team at the meeting were drafted in a memorandum to be issued shortly.

COAL PREPARATION

A memorandum was issued describing the flammability of dried subbituminous coal. Various contacts were made with industrial concerns which have handled hot subbituminous coals to learn of their experiences. As a result of this investigation, CDC recommended that, for maximum safety, the hot, dried Western subbituminous coal be handled in an inert atmosphere in the Demonstration Plant.

Participated in the review of the Williams Impact Dryer Mill proposed by Dravo in ECP D-032 as a substitute for the present Area 202 screens, crusher and dryers. Subsequently, at a meeting on August 5, 1980 in Pittsburgh, PA, with representatives from Williams, Dravo and ICGG the technical feasibility of using the Williams unit in the Demonstration Plant was discussed. As a result of this meeting, CDC prepared process specifications for the Williams Impact Dryer Mill for two commercial and one demonstration design cases. These were issued in a memorandum and will be used by Williams to develop design proposals needed for final evaluation of their system.

Witnessed tests in the Williams pilot plant on August 20 and 21, 1980, using Illinois coal from the SICCC Captain Mine. A further test series will be performed on Western subbituminous coal when received at Williams. Visited Curtiss-Wright in Wood Ridge, N.J. to inspect a Williams Impact Dryer Mill facility.

A study was made to determine differences between pneumatic and mechanical conveying of coal in terms of coal particle attrition. The results indicated that a slight increase in size degradation could be expected by pneumatic conveying, but that this small increase in fines is acceptable to the process. A memorandum summarizing these results was drafted and is under internal review.

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A memorandum was issued presenting the revisions to the Area 202 Screening and Crushing Equipment specifications for Western Subbituminous coal. These revisions are to accommodate the larger size consist required for Western coal identified in the Cameron flash drying tests, performed as part of the Fuller-Kinyon Pump test program.

Memorandum were issued commenting on Area 202 layout drawings supplied by Dravo, reviewing the justification for the backup Coal Dryer (202-44102) which CDC recommended be retained, and updating Dravo's design data on the surface moisture of Western coal.

PYROLYSIS AND GASIFICATION

A review was completed of Dravo's layout changes to determine their effect on the pressure balance. Subsequently, representatives attended a meeting in Pittsburgh, PA on August 19, 1980 to discuss the results and review Dravo's Piping and Layout Model. CDC verbally transmitted its comments to Dravo regarding the layout revisions and made recommendations as to the arrangement of equipment in the model.

Revisions to the Area 203 and 210 pressure balance resulting from Gasifier bed level changes were issued by memorandum. A memorandum was issued transmitting the ECP for making these changes.

Representatives attended several meetings with R. Pfeiffer, N. Nassir and Dravo to discuss refractory and vessel designs in Area 203. As a result of these meetings, agreement was reached on the basis for the refractory design in the gasification section.

A review was made of emergency power requirements. It was concluded that, in the event of a power failure of short duration, Areas 203, 204A and 210 should be kept running at design capacity. Dravo will take this into account in designing an emergency power system.

Responded by memoranda to a large number of process questions raised by Dravo. Forty-four questions on Area 203 design were answered in two memoranda. Two additional memoranda were issued in response to 10 additional questions raised. Two other questions, which were concerned with the procedure for safely opening the pyrolyzers after shutdown, were answered in yet another memorandum and an ECP was prepared to provide additional manways and drain connections for the pyrolysis vessels.

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Recommendations for completing the design work for the distributors in the pyrolysis and gasification sections, and a design basis for auxiliary distributors were supplied in two separate memoranda.

In response to a Dravo request, a memorandum was issued summarizing the Area 203 aeration and purge system process requirements.

A study was performed to determine the Lock Hopper reliability requirements based on the ability of Area 203 to sustain a loss of coal feed. A memorandum presenting the results was drafted and is under internal review.

The COED Pilot Plant corrosion coupon data were reviewed to improve and refine the recommendations on the materials of construction for the various pyrolyzers. A memorandum was issued recommending changing Pyrolyzer D material of construction from 310 to 304 stainless steel to reduce cost. An ECP for this was issued.

Representatives attended meetings at Dravo on July 1, 2, 8-10, 16 and 17, 1980 to review Area 203 P&ID's. This review was completed and Dravo's instrument group is now proceeding with revisions to the P&ID's.

CURL Task IX Reports 5, 6 and 7 were issued dealing with pressure taps and thermowell design, sampling locations, and riser transport gas requirements, respectively.

Editing of the remaining three CURL reports continues.

OIL RECOVERY AND TREATMENT

A review of the Pielkenroad Decanter Design Basis was completed and a memorandum issued documenting the results. CDC agreed with the use of this design and also recommended that the volume of Oil Decanter IV, which is an API-type separator, be increased to provide sufficient dewatering time for the raw oil prior to dehydration. An ECP for this volume change was prepared and issued.

A memorandum was issued documenting a telephone conversation with UOP/SDC representatives concerning oil physical properties and decanter design. In addition, UOP/SDC questions on Area 204A Oil Decanter Sizing were answered by the CDC representative at Dravo.

A CDC representative attended a Dravo meeting with Croll-Reynolds in which Croll-Reynolds recommended substitution of a packed column for the spray tower in the venturi scrubber system. This is now under study to determine what change, if any, is appropriate.

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A CDC representative attended the July 24, 1980 meeting with HRI, in which ICGG and Dravo discussed technical questions regarding the design of Area 204B.

A CDC representative accompanied Dravo and ICGG personnel to the HRI laboratory in Trenton, NJ on July 31, 1980 to discuss the bench-scale hydrotreating of Pittsburgh seam COED oil.

FLUE GAS AND POWER RECOVERY

A representative attended a meeting with Starr Technical Risks Agency, ICGG and Dravo on July 15 in Chicago, IL to review the FGO Control and Safety requirements. The overall control philosophy for the FGO was discussed. It was concluded that, when operating as a normal boiler fired with auxiliary fuel, normal boiler controls would be used; when operating as a flue gas incinerator, the FGO could be controlled according to the control philosophy depicted in the DPPD. From these discussions, a set of guidelines was drawn for design of the FGO Control System.

Representatives attended a meeting with ICGG and Dravo project personnel on July 11, 1980 at Dravo to discuss the minimum engineering effort required by an FGO vendor to arrive at a definite fixed cost price. The engineering effort will also generate sufficient information to satisfy the Task VI detailed design.

The analysis of possible temperature excursions in Area 210 caused by flue gas temperature excursions in Area 203 was reported in a memorandum. It was found that the type of short duration temperature excursion anticipated can be handled without significant problems in Area 210.

A copy of the PRC report on the rating basis for the Induction Generator in the Power Recovery Unit was reviewed. CDC made verbal comments to PRC and Dravo. PRC was also contacted to discuss their experience on generator tie-ins and their interaction with the plant electrical system.

SYSTEMS

Memoranda were issued recommending that Dravo design a system for insuring reliable feed of frozen coal to Area 202, regarding the composition of coal pile additives and their effects on the Demonstration Plant ash content and trace element balances (which were found to be negligible), and reporting on the Metal Properties Council Meeting of May 8-9, 1980.

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Work Forecast

ICGG Benfield, FMC, HRI, Parsons, Shell and UEC will provide Segment II technical services to ICGG/Dravo as required during Task VI. Segment II of the Licensors' subcontracts with ICGG consists primarily of answering technical questions on features of the Process Designs, and review of Dravo generated Task VI Detailed Design Documents.

The HRI laboratory program based on Pittsburgh COED oil will continue on schedule.

HRI will follow up on the few remaining open items from the July 24, 1980 Segment II Consultation at Dravo, through correspondence with ICGG.

HRI will respond to comments on vessel drawing prints marked-up by Dravo and sent to HRI as followup to the July 24, 1980 Segment II Consultation Meeting. A meeting with HRI may be scheduled by ICGG in September 1980 to resolve these vessel comments and review new Task VI work by Dravo.

When the results of the HRI laboratory program are completely analyzed, HRI will rerun the Pittsburgh coal case material balances for Area 204B using the new experimental data on cracking, heteroatom removal, etc. The following minor changes to the Area 204B equipment are expected to result: (1) The Fractionator Light Feed Heater, needed only for the Pittsburgh case, can be deleted; (2) the Vacuum Tower diameter will decrease by 6 inches; and (3) the pipe size of some lines in the distillation section will be reduced. The material balances and equipment for the Illinois and Western coal cases will not be affected in any way, nor will these changes delay the completion of Task VI.

Dravo Continue Demonstration Plant definitive design work essential for preparation of the Construction Bid Package(s), the Task VI deliverable. This includes the development of layouts, diagrams, requisitions and drawings.

Complete work on the Construction Schedule.

Continue to study the trade-off analysis for the delivery of Illinois coal and the railroad car handling logic.

Review results of future Williams Venturi Impact Dryer Mill Systems tests conducted on Western subbituminous coal to determine the dryer selection.

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Issue the report to ICGG presenting Dravo's assessment and position regarding the structural design approach to Area 203.

Continue work on the development of refractory design for vessels and piping in Area 203.

Continue detailed design work on Cooling Tower water treatment equipment.

Continue to investigate the means of controlling emissions in the Tank Farm.

Continue preparation of the Hazard Specification.

Prepare a formal response for ICGG outlining Dravo's concepts for fire alarms, evacuation alarms, plant communication and security systems.

Continue preparation of enlarged Plot Plan drawings.

Continue work on preparation of specifications for the Data Logger, vent header sizing for the flare system, the study of underground pressure piping and yard service racks, design engineering specifications, standard detail drawings, the equipment list and lighting fixture schedule.

CDC Issue answers to questions raised by DOE at the Design Review Meeting held August 6 and 7, 1980 in Pittsburgh, PA.

Continue to follow the further testing of the Williams Impact Dryer Mill, evaluate test results and Williams proposals, and issue a recommendation on use of this system.

Continue editing and issue the remaining CURL Task IX reports.

Conclude the study of the Croll-Reynolds recommendation for substituting a packed column for the spray tower in the venturi scrubber system.

Continue the review of updated utility balances as Dravo makes them available.

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2.7 Construction Planning

Work Forecast

Dravo Initiate Task VII activities.

2.8 Economic Reassessment

Work Accomplished

CDC Work began on revising the Conceptual Commercial Plant material and energy balances for Illinois Coal, and preparing the commercial plant input-output material balances for the two alternate coals, all based on applicable changes from the CCD which occurred in the course of Demonstration Plant design. A memorandum was issued which itemizes these changes. Revisions to computer programs were started to accommodate the changes.

Work Forecast

Dravo Initiate Task VIII activities.

CDC Complete material and energy balances computer program revisions, and prepare material and energy balances and PFD revisions for all three cases.

2.11 Project Management

Work Accomplished

ICGG During July 1980, ICGG and Dravo compiled a list of Demonstration Plant Design changes which occurred after the Record EAR was issued, and which could possibly lead to significant changes in the environmental impact of the Demonstration Plant. This list was furnished to DOE. In August 1980, a review of these design changes was begun. The results of this review may be an addendum to the EAR which will be submitted to DOE as input to the final EIS. However, no such significant changes requiring an EAR addendum have as yet been identified.

Three Project Engineers were in residence in Pittsburgh, PA, monitoring Dravo's Task VI design effort, and maintaining liaison with representatives of CE, CDC, METC and UOP/SDC, also in residence at Dravo.

Biweekly Review/Coordination Meetings were held by ICGG, Dravo, CDC and EA on June 5 and 19, July 9 and 25, and August 13 and 27, 1980, in Pittsburgh, PA.

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Current project status, work accomplishments, technical items of concern and future work coordination were the main subjects of the discussions. Government site representatives from CE, METC and UOP/SDC attended part of the June 19, July 9 and 23, and August 13 meetings and all of the August 27 meeting, so that the Government site representatives could be kept informed of Task VI progress.

On June 3, 1980, the DPPD Report (minus Section 3, Demonstration Plant Area Descriptions) was transmitted to DOE. Section 3, which was essentially complete by the end of June 1980, was finished soon after receipt of DOE comments at the July 10, 1980, Area 213 Baseline Review Meeting, and was delivered to DOE early in August 1980. DPPD Section 3 constitutes the "Design Baseline", which has been the basis for implementation of Configuration Management for the process areas.

An ICGG representative participated in meetings held by Dravo with Linde Division of Union Carbide, on June 4, 1980 and with Air Products and Chemicals on June 10, 1980, potential suppliers of engineering designs for the Area 218 Biotreatment Plant. It was decided not to purchase a design from either company at this time, but information obtained during these two meetings will be used by Dravo to prepare the Task VI specification for the Biotreatment Plant.

On June 10-11, 1980, a Review Meeting on CDC Area Vessel, Piping and Insulation Design was held at Dravo. Consultants R. Pfeiffer and N. Nassir participated, as well as ICGG, CDC and Dravo representatives. METC, UOP/SDC and CE representatives attended as observers. The primary topic discussed was material selection for the multitude of structural and insulating services in Area 203 - Vessels, Gas Distributors, Cyclones, other Vessel Internals, etc. This review was continued in a follow-up meeting held on July 24-25, 1980 at CDC in Princeton, NJ. Further refinement of the same detailed design considerations took place during a Materials of Construction Review Meeting for Area 203 held at Dravo on August 20-21, 1980 attended by representatives of ICGG, Dravo, CDC, EA, PRC and R. W. Pfeiffer. The main topic of discussion was revision of the Gasifier and Pyrolyzer E insulations to more conventional designs. Pyrolyzer E was changed from a refractory lined low-alloy steel vessel to an externally insulated Type 310 Stainless Steel Vessel, to avoid potential refractory problems. The Gasifier Refractory Design was fixed. A conventional

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hardface over medium density castable insulating refractory will be used, similar to typical modern Fluid Catalytic Cracker Regenerator Vessel design. The Gasifier shell metal temperature will be above the dew point of the gasifier gases under all weather conditions, to avoid potential corrosion caused by condensed water and acid gases. Means to minimize gasifier heat loss from this relatively hot shell are currently being investigated.

On June 12, 1980, a working session was held with N. Nassir, L. Seglin, and representatives of Dravo and ICGG, at which the Power Recovery Unit Specification was discussed, with the goal of finalizing the specification so that the classifying of this unit as a Long Lead Time Item can be pursued. Discussion also took place on the FGO operation, and upset conditions in Areas 203 and 210 which might cause overtemperature at the expander inlet. It was concluded that the Area 203 and 210 Control System designs offer sufficient control to prevent excessive overtemperature of the Flue Gas Expander from occurring. PRC subsequently began work on finalization of mechanical specifications for the Power Recovery Unit specification.

A meeting was held on June 19, 1980, at HRI in Miami, Florida, to discuss and answer MOUND's questions on HRI's Detailed Process Design Report. Representatives of HRI, MOUND, ICGG and Dravo attended. All of MOUND's questions were answered verbally, and later in writing. ICGG and Dravo also asked some questions relating to Dravo's Task VI work in Area 204B, which HRI answered satisfactorily.

On June 24, 1980, ICGG, Dravo and Illinois Power Company representatives met in Pittsburgh to discuss the electrical power supply requirements for the Demonstration Plant.

On June 24, 1980, representatives of ICGG, Dravo and Jacobs Engineering Company met in Pittsburgh to discuss information needed by Dravo to design the Area 202 Western Coal Flash Drier. Purchase of additional design information from Jacobs was considered but later was judged unnecessary.

On June 25, 1980, ICGG and Dravo Program Management met with DOE and CE Program Management at UOP/SDC in McLean, VA. Many topics concerning the completion of Phase I were discussed, including Construction Planning and Task VI Design Reviews.

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P&ID Review Meetings for Area 210 were held in Pittsburgh on June 25-26, 1980, attended by ICGG, Dravo and CDC representatives, as well as consultants N. Nassir and L. Seglin. These were working sessions in which specific details of the Area 210 P&ID's were reviewed from the operational viewpoint, and additions or deletions of instruments made as deemed appropriate. The PFD's and the control philosophy were not altered by this review.

The last Task II PDBP for Area 213, was issued for DOE review on July 1, 1980. The Baseline Review Meeting for this area took place on July 10, 1980, in Pittsburgh, PA, attended by representatives of ICGG, Dravo, METC and UOP/SDC. Revisions were made to Area 213 documents per this meeting, which completed the Task II Baseline Procedure for all Demonstration Plant Process Areas.

On July 1-2, 1980, an Area 203 P&ID Review was held by ICGG, CDC and Dravo representatives. The objective of this meeting was to resolve CDC comments on the P&ID's, and discuss other P&ID details which could not be properly addressed until Task VI. Because of the complexity of Area 203, this review required continuation on July 8, 9, 10, 15 and 16, 1980, to be completed.

Dravo began work on the Demonstration Plant construction schedule, the basis of which was discussed with ICGG in meetings held at Dravo on July 11 and July 22, 1980. Dravo is scheduled to complete this work on September 26, 1980.

The Draft EIS was reviewed and comments submitted to DOE on July 14, 1980. ICGG also supplied DOE with a list of persons qualified to serve on the panel for the Public Hearing to be held by DOE after DOE issuance of the Draft EIS for public comment. Panel members recommended by ICGG are persons who are independent of DOE or ICGG and its member companies, yet are aware of the ICGG project and residents of the region to be affected by the ICGG Demonstration Plant.

A Project Engineer worked with G&H on the completion of the PSD Permit Application, and hand delivered it to the Illinois EPA on July 14, 1980.

On July 15, 1980, a meeting took place at the ICGG office in Chicago, IL, at which ICGG and ICGG's Insurance Underwriters reviewed the combustion controls on three unique Demonstration Plant Furnaces. Parsons presented the rationale behind the control of the Area 212 Claus Reaction Furnace and Thermal Oxidizer. CDC

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explained the operation and control of the FGO. . Agreement was reached that the combustion controls are acceptable to the Insurance Underwriters.

In July 1980, a Project Engineer met with Alberici Construction of St. Louis, MO and obtained an estimate of the Demonstration Plant site preparation cost to compare with Dames & Moore's estimate.

Representatives met with EVT in Stuttgart, West Germany during the week of July 21, 1980, negotiating a subcontract for design of the Area 203 Combustor. As a result of these meetings, a subcontract satisfactory to both EVT and ICGG was assembled by ICGG and submitted to DOE for approval. DOE provisional approval was received during the last week of August 1980, and work under this subcontract was initiated immediately.

On July 31, 1980, representatives of ICGG, HRI, Dravo and CDC met at HRI's laboratory facilities in Lawrenceville, NJ, discussing the preliminary results of the H-Oil® bench scale testing of Pittsburgh COED oil. This trip included witnessing of a tear-down of the bench scale H-Oil® Reactor after 30 days continuous operation on the COED oil feedstock, and inspection of the Reactor System and aged catalyst for signs of coking. No signs of coking or catalyst agglomeration were observed, and preliminary results indicated that heteroatom removal activity was higher than predicted. Final results from the bench-scale program will not be available until October 1980.

Meetings to discuss preparation of PMN's required under TSCA regulations for Demonstration Plant Product #2 and #6 Fuel Oils were held at G&H in New York on July 15, 1980 and at FMC in Philadelphia on July 22, 1980. Representatives of ICGG, Dravo and CDC participated in these meetings.

On July 23, 1980, ICGG and Dravo representatives met with ORNL representatives in Pittsburgh, PA to discuss the possibility of altered environmental impacts of the Demonstration Plant since submittal of the EAR due to possible recent design changes. A course of action, to determine whether any such changes exist and to assess their impact, was agreed upon and is being followed by Dravo. No significant changes to environmental impact by the Demonstration Plant had been found, as of August 31, 1980.

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ICGG, Dravo and CDC met with representatives of the Williams Patent Crusher & Pulverizer Company on August 5, 1980, in Pittsburgh, PA. The subject discussed was the proposed ECP Number D-032, which would substitute a Williams Impact Dryer Mill for the crushing, screening, surface drying and flash drying equipment in Area 202, at a substantial capital savings. It was decided to evaluate this Mill's performance through tests on Illinois #5 & 6 coal and Western Subbituminous coal, before ICGG and CDC would endorse the ECP. Illinois coal from the SICC Captain Mine was shipped to Williams in St. Louis, MO, and tested on August 20, 1980, with very good results. Representatives of ICGG, CDC, Dravo and UOP/SDC attended this test. As of August 31, 1980, Western coal ordered by ICGG had not arrived at Williams. Hence, evaluation of the proposed system will not be completed until September 1980.

Representatives of ICGG met with CE and DOE on August 5, 1980, in Pittsburgh, PA to discuss current Government concerns, including the format of Task VI specifications, results of independent UOP/SDC checks on Dravo design work and attendance of Government representatives at meetings held at Dravo.

On August 6-7, 1980 a Process Design Review Presentation was held for DOE, UOP/SDC, METC, PETC and CE by ICGG, Dravo and CDC in Pittsburgh, PA. Covered in this review was the Demonstration Plant design status at the end of Task II, with emphasis placed on plant integration, overdesign factors, safety and health considerations, equipment sparing and plant availability. Questions asked by Government representatives and answers by Contractor representatives were recorded and compiled, and will be forwarded to DOE during September, 1980. Additionally, other Government questions were received, both orally and in writing, which were not answered during the presentation. These questions were compiled and answers were prepared, which will also be forwarded to DOE during September 1980.

On August 22, 1980, ICGG met with Dravo to discuss the possibility of using two separate electrical feeds to the Demonstration Plant, coming in via separate lines from two difference baseloaded generating stations in Southern Illinois. The proposal has definite merit, and recommendations relating this to Demonstration Plant operation in case of power supply failure are now being finalized by Dravo.

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On August 28, 1980, ICGG and Dravo met with representatives of ORNL to discuss the Demonstration Plant Process Design in relation to possible hazards which ORNL must be able to address in the EIS. Because ORNL's Union Carbide employees do not have secrecy agreements with any of ICGG's subcontractors, the discussions involved only nonproprietary information.

During August 1980, EA commented on aeration tap locations in char standpipes. EA's independent investigation of aeration requirements found the present design operationally most conservative; however, no design changes will be made.

During August 1980, representatives met with the Illinois Department of Transportation and with the Illinois Division of Waterways, seeking complete information on permit applications for crossings of streams and roads by the water pipeline and the railroad spur, and requirements for accompanying drawings.

Project Engineers worked throughout the quarter reviewing and approving Task VI documents submitted by Dravo for ICGG approval, including equipment specifications, vessel drawings, civil/structural drawings, piping specifications, instrumentation specifications and new issues of P&ID's.

Production of nonproprietary TIC versions of Contract Deliverables took place throughout the quarter. The TIC version of the PER was completed during June 1980. The TIC versions of the CCD and the DPDA were completed during July 1980. The TIC version of the DPPD was completed during August 1980, fulfilling DOE's request for TIC versions of these 4 reports.

Conducted audits of Direct Costs of G&H at their New York office and Dravo Chemical Plants at their Pittsburgh office.

Representatives of ICGG and Clark Oil and Refining Corporation met on June 2, 1980 in ICGG's office in Chicago, IL to discuss Clark's interest in the liquid by-products of the demonstration plant.

On July 18, 1980, representatives of ICGG, Arch Minerals Corporation, and CE met in St. Louis, MO to participate in land option negotiations. Arch's position prevented coming to an acceptable agreement on price at this meeting.

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ICGG, Dravo and CDC representatives held a Source Selection Board meeting via conference telephone call on July 11, 1980 to discuss the Government's recommendations for procurement of the FGO package.

Representatives of ICGG, DOE and CE met in Huntsville, AL on August 19, 1980 to discuss standardization of construction items, construction contract packages, and procedures for handling Government-Owned Property.

Dravo The Phase I schedule defining work to be performed during Stage 2- Final Engineering Design was submitted to ICGG.

The MSS/DSS was updated to show the completion of Task II process design activities. The Task VI schedule was refined and updated as required by work in progress, and the Task VI DSS was expanded to define individual documents.

Preparation of Class I and II ECP's is in progress, with preliminary copies of the ECP's being issued to ICGG for review prior to submittal of the finalized document. As work on ECP's was initiated, they were added to the DSS. The DSS is then used to track the progress of all Dravo ECP's, from inception through completion or disapproval. On the approved ECP's, the engineering discipline with the majority of the responsibility updates the DSS to indicate completion of the ECP after the changes have been incorporated into the engineering documents.

On June 25, 1980, representatives from DOE, ICGG and Dravo met at the UOP/SDC office in McLean, VA, to discuss the Construction Schedule and the SARS Proposal. Work is in progress on finalizing Dravo's organizational plans for the implementation of SARS and the concomitant FMEA.

On August 13, 1980, Dravo submitted CCP-G2 to ICGG for Chemical Plants Division's Tasks II, III, V, VI, VII, VIII, IX, X and XI activities, and for G&H's Tasks I, III, IV, V and XI. Preparation of the narrative to justify the baseline was then initiated. G&H assisted Dravo in this effort by submitting narratives for Form 60 delta costs covering its Tasks I, III, IV, V and XI activities.

Dravo completed its preparation and submittal of information required by ICGG for publication of the DPPD by issuing Subsections 3.3 and 3.4, the Demonstration Plant Area Descriptions for Areas 203 and

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204 respectively. Each of these subsections had been updated and revised to reflect changes in accordance with the PDBP Record Document, which had been submitted to ICGG in May.

Work in progress on TIC report production was completed. The sanitized versions of the PER and DPDA were issued to ICGG for publication to DOE in June, the CCD in July, and the DPPD in August.

On August 13, 1980, representatives of ICGG, CDC, Dravo and EA met with Croll-Reynolds Company, manufacturers of Venturi Scrubbers and other gas scrubbing equipment. Croll-Reynolds reviewed the current Area 204A scrubber and separator design which are based on work done by Research-Cottrell for CDC. Croll-Reynolds found the current system to be reasonable in terms of pressure drops and particulate removal efficiencies. They considered the amount of scrubwater provided to be generous. They also recommended that the Spray Tower in Separator II be fitted with internals, either dish-and-doughnut or packing because a temperature cross is difficult to achieve in open spray towers. Dravo is currently working to incorporate this suggestion.

G&H and Dravo representatives participated with ICGG and CDC in the Monthly and Quarterly Oral Briefings held to present project progress to the government agencies.

A study is in progress to establish the design basis for the Emergency Power System. In conjunction with this study, a meeting was held at the Dravo office in Pittsburgh, PA, with representatives from General Electric Company to discuss emergency power requirements and system stability in case of a utility failure during Plant operation. Health and safety studies are being performed, with preliminary process stream health and safety characterizations being completed for Areas 203, 204A, 205 and 212. Preparation of the health and safety characterization is in progress for Areas 204B, 206, 207, 208, 209, 210 and 211.

Hazardous gas monitoring locations have been tentatively selected for Areas 205 and 212, and are being reviewed for Area 203.

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Representatives from ICGG and Dravo met at the Dravo office in Pittsburgh, PA, to discuss the initiation of Task VI Reliability and Quality Assurance surveillance activities.

The Dravo R/QA Manager held a kickoff meeting to explain the principles and purpose of the Task VI surveillance and auditing program to the Project Staff and to key engineering personnel. On June 23, 1980, under provision of Dravo R/QA Procedures 7051-A4.1 and 7051-A4.2, the Dravo R/QA Group initiated its surveillance and auditing.

Meetings were held at the Dravo office in Pittsburgh, PA, with the ICGG Director of Product Assurance to discuss ICGG's comments on a draft of the revised Dravo R/QA Procedures 7051-A4.2.

Preparations are in progress for the 30% Design Review. Copies of drawings are being compiled, as requested by CE, for distribution. In addition, calculations, backup information for design analyses and studies, and up-to-date Design Basis will also be available for review. The current schedule for the 30% Design Review shows that at least three sessions will be required to cover the design information. These sessions will be held as follows:

- First Session - Week of September 22, 1980
(Areas 205, 206 and 216)
- Second Session - Week of October 6, 1980
(Areas 201, 207, 208, 209, 210, 211, 212, 217 and 219)
- Third Session - Unscheduled as of this date
(Areas 202, 203, 204, 213, 214, 215, 218 and 220)

CDC ICGG has issued limited authorization to CDC to commence certain administrative aspects of the Toxicological Screening Program - Task 1.9.8. Proposed lower-tier subcontracts were prepared under this limited authorization for the "Toxicological Screening Program" and were sent to ICGG for their review. The subcontracts covered the following work:

- Acute Inhalation Toxicity
- Ames Test, DNA Repair and Mouse Lymphoma
- Mitotic Gene Conversion

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- Acute Oral and Dermal Toxicity,
Dermal Irritation and Sensitization
and Eye Irritation
- In Vivo Cytogenetic Testing of No. 6
fuel oil

The "Certificate of Current Cost or Pricing Data" requested by ICGG in connection with the Task 1.9.8 Toxicological proposal was prepared and submitted to ICGG.

Cost Change Proposal G-2, which has revised CDC's Phase I manpower and cost estimates, was completed and submitted to ICGG. This estimate assumes an April 1981 Phase I completion date. The inclusion of certain cost elements in CDC's submission of CCP G-2 was reviewed with ICGG. A memorandum was issued at the request of ICGG updating the listing of CDC Task II and Task VI work remaining in Phase I.

Written authorization was received from ICGG allowing CDC to commence Task 2.6 and 2.8 work effort. CDC commenced its task 2.6 activities on June 23, 1980 and its Task 2.8 activities on August 1, 1980. ICGG verbally advised CDC that the revised Task VI material and energy balances should be included in CDC's work program.

ICGG was advised that the services of a temporary engineer was acquired and has agreed to extend its approval to cover the minor changes made to the purchase order.

A request to ICGG was submitted to increase the CDC 1980 provisional indirect billing rate.

A foreign travel request was submitted to ICGG in connection with an EVT combustor meeting and was subsequently approved.

Management staff participated in the review and editing of the PER, CCD, DPDA and DPPD necessary for preparation of nonproprietary versions.

A memorandum was issued commenting on sections of the draft EIS pertaining to slag leaching and ground water contamination.

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Representatives participated in a meeting on PMN preparation at G&H on July 15, 1980.

All technical and financial reports contractually required were submitted to ICGG. CDC staff participated in the periodic DOE Monthly Briefings, ICGG Biweekly Coordinating Meetings, and the August 6-7, 1980 DOE Process Design Review.

CDC has provided secrecy agreements to eight vendor companies at the request of Dravo. Three have been completed and signed.

Work Forecast

ICGG An addendum to the EAR will be submitted to DOE if the Demonstration Plant Design changes made after submittal of the EAR are identified as having significant environmental impact. Participate in DOE's public hearing on the draft EIS.

Project Engineers will continue to monitor and coordinate the activities of all subcontractors working on the ICGG Project.

Project Engineers will review and approve Task VI documents issued to ICGG by Dravo.

Project Engineers will maintain liaison with CE, METC and UOP/SDC representatives in residence at Dravo.

Segment II consultations and Review Meetings will take place with Process Licensors as required. HRI will respond to Dravo comments on vessel drawings and Benfield will review a new revision of Area 206 P&ID's during September 1980.

Testing of the Williams Impact Dryer Mill with Western Coal will take place early in September 1980, and recommendations by CDC and ICGG regarding this proposed change will be finalized.

Work under the subcontract with EVT for design of the Combustor will get underway on September 2, 1980, as Government approval has now been received. EVT will meet with ICGG, CDC and Dravo during the week of September 8, 1980, in Pittsburgh, PA, to exchange information vital to EVT's commencement of design work.

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The requirements for keeping equipment in CDC areas operating during electrical power failures, and to integrate the needs identified into the overall power failure emergency plans will be assessed.

ICGG, Dravo and CDC will conduct a review of the Area 203 Block Model for Government representatives on September 4, 1980.

Demonstration Plant 30% Design Reviews will take place during the weeks of September 22, 1980, and October 6, 1980, in Pittsburgh, PA.

Biweekly Review/Coordination Meetings will be held periodically by ICGG, Dravo, CDC and EA. Government site representatives will be invited to attend these meetings.

Conduct an audit of CDC Direct Costs at their Princeton, NJ office.

Obtain CE direction on revised CDC overhead rate approval by DCAA.

Review CDC pricing and contracting methods for the toxicological effort.

Choose two or three qualified vendors for the design of, and negotiate a fixed price contract for the fabrication and erection of, the FGO.

Continue negotiations with Arch Minerals Corporation for a land option agreement and investigation of alternatives should negotiations fail.

Issue procedures for handling Government-Owned property after approval of draft plan submitted to CE.

Dravo Refine and update the Task VI schedule as required by work in progress.

Continue to update the MSS/DSS to show Task VI activities and work initiated in Tasks VII and VIII. The DSS will be expanded to show progress in preparation of the ECP's.

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Finalize plans for the implementation of SARS and FMEA.

Issue the supporting narrative to ICGG justifying CCP-G2.

Continue work on the study to establish the design basis for the Emergency Power System, preparation of the health and safety characterizations, and the review of hazardous gas monitoring locations.

The Dravo R/QA Group will continue the surveillance and auditing of Dravo's Task VI definitive design engineering operations.

Continue preparations for the 30% Design Review and participate in the sessions.

CDC Continue to prepare and report technical and financial information in accordance with the subcontract reporting requirements.

Resolve outstanding audit questions with ICGG.

Consummate vendor secrecy agreements listed.

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CONCLUSIONS

During this past quarter, the transfer of the Administrative Contracting Officer duties to the Corps of Engineers has required adjustments in procedures which are still being implemented. Execution of a contract for design of the Combustor at the end of the quarter was two weeks late, but should not hold up completion of Task VI.

Preparation of the supporting documentation for ICGG's CCP-G2, which will be submitted to the Government early in the next quarter, is being finalized.

Assuming no constraints on available funds, and no significant additional scope of work being added to the project, the program should progress in an orderly and effective manner during the next quarter.

U.S. DEPARTMENT OF ENERGY

MILESTONE SCHEDULE AND STATUS REPORT

PAGE 1 OF 1

FORM DOE 535
(1/78)FORM APPROVED
OHS NO. 28 R-0180

1. Contract Identification		PIPELINE GAS DEMONSTRATION PLANT																2. Reporting Period 08/01/80 through 08/31/80				3. Contract Number EF-77-C-01-2012						
4. Contractor (name, address)		ILLINOIS COAL GASIFICATION GROUP ROOM 3734 55 E. MONROE STREET CHICAGO, ILLINOIS 60603																5. Contract Start Date 06/07/77				6. Contract Completion Date 11/30/80						
7. Identification Number	8. Reporting Category (e.g., contract line item or work breakdown structure element)	9. Fiscal Years and Months																10. Percent Complete										
		FY 77	FY 78				FY 79				FY 80								FY 81				a) Planned	b) Actual				
		77	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	O	N	D	J	F	M	A	M	J	Q4	Q1	Q2	Q3	Q4				
1.0	Conceptual Design	[Gantt chart showing progress from FY 77 Q1 to FY 80 Q4]																									N.A.	100
1.1	Conceptual Design and Evaluation of Comm Plt	[Gantt chart showing progress from FY 77 Q1 to FY 80 Q4]																										100
1.2	Demonstration Plant Process Design	[Gantt chart showing progress from FY 77 Q1 to FY 80 Q4]																										100
1.3	Site Evaluation and Selection	[Gantt chart showing progress from FY 77 Q1 to FY 80 Q4]																										92
1.4	Demonstration Plant Environmental Analysis	[Gantt chart showing progress from FY 77 Q1 to FY 80 Q4]																										92
1.5	Materials and Licenses	[Gantt chart showing progress from FY 77 Q1 to FY 80 Q4]																										46
1.9	Technical Support	[Gantt chart showing progress from FY 77 Q1 to FY 80 Q4]																										77
1.10	Long Lead Procurement List	[Gantt chart showing progress from FY 77 Q1 to FY 80 Q4]																										79
1.11	Project Management	[Gantt chart showing progress from FY 77 Q1 to FY 80 Q4]																										100
2.0	Final Engineering Design	[Gantt chart showing progress from FY 77 Q1 to FY 80 Q4]																										27
2.6	Demonstration Plant Definitive Design	[Gantt chart showing progress from FY 77 Q1 to FY 80 Q4]																										27
2.7	Construction Planning	[Gantt chart showing progress from FY 77 Q1 to FY 80 Q4]																										0
2.8	Economic Reassessment	[Gantt chart showing progress from FY 77 Q1 to FY 80 Q4]																										2
2.11	Project Management	[Gantt chart showing progress from FY 77 Q1 to FY 80 Q4]																									N.A.	33
11. Remarks																												
12. Signature of Contractor's Project Manager and Date R. J. Eby													13. Signature of Government Technical Representative and Date J. E. Malcolm															

MILESTONE SCHEDULE AND STATUS REPORT

PURPOSE

A dual-purpose format to establish a baseline schedule and indicate status for performing each reporting category identified in the contract/agreement.

INSTRUCTIONS

- Item 1 - Enter the contract/agreement title as it appears in the official document establishing the contract/agreement.*
- Item 2 - Enter the inclusive start and completion dates for the reporting period for this report.*
- Item 3 - Enter the contract/agreement number as it appears in the official establishing document and append the latest modification number.
- Item 4 - Enter the name and address of the contractor, organization, or agency, as they appear in the contract/agreement.*
- Item 5 - Enter the official start date of the original contract/agreement.*
- Item 6 - Enter the official completion date, as of the latest official modification to the contract/agreement.*
- Item 7 - Enter the identification numbers relating to the contract line items, task, products, or work breakdown structure elements reported in Item 8.
- Item 8 - Enter the same contractually specified reporting categories that are on the associated Cost Plan and Manpower Plan.
- Item 9 - In the lower portion of the space for the item heading, enter the first letter of the month for the first report in the extreme left block. Enter successive months as required. Enter fiscal years in upper portion of the heading space as appropriate for months. Separate fiscal years by extending vertical line between the months of September and October. Enter schedule data below the fiscal year and month headings and to the right of each reporting category listed in Item 8. Use charting information shown at end of these instructions.
- Item 10 - Based on the contractor's best judgment, enter an assessment of actual percent complete toward meeting the objective of each reporting category listed in Item 8. The planned percent complete column is required only for construction contracts.
- Item 11 - Enter any explanatory notes and comments. If more space is required attach additional sheets and so indicate in this block. All schedule variances which exceed established contract thresholds must be explained in the Project Status Report.
- Item 12 - Enter signature of responsible contractor, agency, or organization project manager and date signed verifying the reasonableness of the information furnished, based upon his personal knowledge of the contract's progress and status.
- Item 13 - Signature of DOE Government Technical Representative and date indicating the GTR has reviewed the report. The signature does not constitute a certification of the accuracy of the report nor does it constitute any agreement with the contents of the report, or commit the Government in any way.

*These items need only be entered on the first page of multi-page reports.

CHARTING INFORMATION

SYMBOLS

- △ Major Milestone
- ◊ Major Milestone on the Project Critical Path
- ▽ Intermediate Event (Deliverable, Supporting Milestone, or Decision Point)
- ▲ Intermediate Event completed early or late
- Proposed Scheduled Deviation (late or early) for a Major Milestone
- ▬ Activity Bar
- Time Line
- Time Now

EXAMPLES

- A. Major milestone with an activity bar
- B. Time now and work done, event on critical path
- C. ○ Schedule Deviation (not yet approved)
- D. First change approved (slippage)
- E. Improvement, not contractually implemented for a Major Milestone
- F. First change approved (improvement)
- G. Activity ahead of schedule
- H. Activity behind schedule
- I. Late and on time completion of intermediate events A and B, respectively
- J. Same as Example I, above except that here a time line is used in place of an activity bar
- K. Original major milestone date and four subsequent approved changes (all slippages) to that date
- L. Original major milestone date and two subsequent approved changes (one slippage, one improvement to that date)
- M. Intermediate event schedule deviation

CONVENTIONS

- 1 - Blacked-in figures or bars are used to show work done.
- 2 - Open figures or bars show work not done.
- 3 - △ (Major milestone) is twice as large as ▽ or ▲ (intermediate event).
- 4 - Under no condition should more than one △ (major milestone) be shown on a single horizontal line. (See Examples D and F for a method of denoting a rescheduled major milestone ◊; the number "1" indicates the first rescheduling.) Normally the original symbol △ would be shown with the latest rescheduled date (a ◊ with an associated frequency number). In certain cases, where it is desired to show a complete history of rescheduling, a series of ◊'s with associated frequency numbers might be shown as in Example K. If it is not desirable to retain the rescheduling history DOE may request that only the current approved major milestone be shown.
- 5 - Symbols for milestones may be used alone, with an activity bar, or with a time line as the preparer judges best.
- 6 - Intermediate events may be shown only in association with an activity bar or a time line. These event symbols are placed above the bar or line and each is labeled for identification. A description of each intermediate event should be provided in an attachment to the Milestone Schedule and Status Report. One of the two methods is used to show when intermediate events are completed.
 - a - If the event is completed on time, it is blacked-in as shown above (see Example G Event A).
 - b - If the event is completed early or late, the symbol for the intermediate event is inverted (▲) and shown below the line or activity, identified in the same way as the original. The originally planned completion date above the line is left open (not blacked-in) and the deviation to it (below the line) is blacked-in (see Example H, Event A).

MILESTONE LOG

EF-77-C-01-2012

CONTRACT NUMBER

IDENTIFICATION NUMBER	DESCRIPTION	PLANNED COMPLETION DATE	CURRENT ESTIMATE OF DELIVERY DATE	ACTUAL COMPLETION DATE	COMMENTS
1.1A	Conceptual Commercial Plt Baseline (Flowsheets)	8-Aug-77		3-Aug-77	
1.1B	Drawings/Diagram (Flowsheet) Documentation	8-Aug-77		3-Aug-77	
	Key				
1.1C	Tabulation of Trade-Off Evaluation	8-Aug-77		3-Aug-77	
1.1D	Design Data Tabulation	8-Aug-77		3-Aug-77	
1.1E	Process Evaluation Report	18-Nov-77		25-Jun-78	
1.1F	Revised Conceptual Commercial Plant Baseline (Flowsheets)	18-Dec-77		28-Aug-78	
1.1G	Conceptual Commercial Plant Design Report	7-Jun-78		28-Sep-78	
1.2A	Demonstration Plant Process Design Tentative Baseline (Flowsheets)	18-Jan-78		28-Dec-78	
1.2B	Demonstration Plant Process Design Report (Baseline Design)	7-Jun-78		3-Jun-80	
1.2C	Demonstration Plant Design Analysis Report	7-Jun-78		8-May-80	
1.2D	Demonstration Plt Economic Considerations Report	7-Jun-78		8-May-80	
1.3A	Initial Real Estate Report	8-Aug-77		3-Aug-77	
1.3B	Comprehensive Real Estate Report	7-Jun-78	17-Nov-80		
1.3C	Site Master Plan	7-Jun-78		21-Jul-80	
1.3D	Climatological and Meteorological Report	7-Jun-78		26-Sep-78	
1.3E	Preliminary Foundation Investigation and Soil Analysis Report	7-Jun-78		27-Sep-78	
1.3F	Site Survey Report	7-Jun-78		22-Sep-78	
1.3G	Local Resources Survey Report	7-Jun-78		11-Aug-78	
1.3H	Site Transportation Study Report	7-Jun-80		22-Sep-78	
1.3I	Site Water Resources Report	7-Jun-78		26-Sep-78	

MILESTONE LOG

EF-77-C-01-2012

CONTRACT NUMBER

IDENTIFICATION NUMBER	DESCRIPTION	PLANNED COMPLETION DATE	CURRENT ESTIMATE OF DELIVERY DATE	ACTUAL COMPLETION DATE	COMMENTS
1.3J	Site Environmental Survey Report	7-Jun-78		27-Sep-78	
1.4A	Base Environmental Analysis Report	8-May-78		29-Jun-79	
1.4B	Record Environmental Analysis Report	19-Jun-78		28-Sep-79	
1.5A	Permits and Licenses Plan	TBS		30-Nov-79	
1.5B	PSD Documentation	TBS		18-Jul-80	
1.5C	Final Report and Plans	TBS	31-Mar-81		
1.9A	Tentative Technical Support Plan	8-Aug-77		3-Aug-77	
1.10A	Tentative Long Lead Time Procurement List	18-Jan-78		21-Aug-79	
1.10B	Long Lead Time Equipment Listing (Update)	7-Jun-78	1-Oct-80		Pending Resolution of Construction Schedule
1.11A	Management Plan	8-Aug-77		4-Aug-77	
1.11B	Management Plan Annex (Documentation Change Control)	8-Aug-77		3-Aug-77	
1.11C	Network Analysis Document	7-Apr-78		23-May-78 (Partial)	Update issued 14-Sep-79 Addendum 1 on 1-Oct-79, Addendum 2 on 30-Nov-79 and Addendum 3 on 28-Dec-79
1.11D	R & QA Plan	7-Apr-78		1-Jun-79	Revision 3 issued 10-Jun-80
1.11E	Configuration Management Plan	7-Apr-78		12-Apr-79	Revision 5 issued 20-Jun-80
2.6A	30% Plant Design Review	TBS	14-Nov-80		
2.6B	60% Plant Design Review	TBS	25-Feb-81		
2.6C	Final Plant Design Review	TBS	31-Mar-81		
2.6D	Plant Design and Construction Bid Packages	TBS	31-Mar-81		
2.11A	Summary Network Analysis Document	As Req.		15-May-80	

Subcontractor		DATES FOR BOTH PLANNED AND ACTUAL ACTIVITY					
ACTIVITY		Master Schedule		Actual Dates (for Past Activities)		Current Outlook (for Future Activity)	
CWBS No.	Name	Start	Complete	Start	Complete	Start	Complete
1.0-x	Conceptual Design	6-7-77	5-31-78	6-7-77	4-30-80		
1.1-x	Conceptual Design and Evaluation of Commercial Plant	6-7-77	5-22-78	6-7-77	9-30-78		
1.2-x	Process Design - Demonstration Plant	11-18-77	5-22-78	12-1-77	7-31-80		
1.2.1-x	Coal Unloading and Handling	11-18-77	5-7-78	9-4-78	5-30-80		
1.2.2-x	Coal Preparation	11-18-77	5-22-78	12-1-77	6-2-80		
1.2.3-x	Pyrolysis and Gasification	11-18-77	5-22-78	12-1-77	5-30-80		
1.2.4-x	Oil Recovery and Treatment	11-18-77	5-22-78	12-1-77	6-17-80		
1.2.5-x	Gas Purification	11-18-77	5-7-78	9-4-78	5-30-80		
1.2.6-x	Hydrogen Generation	11-18-77	5-7-78	8-28-78	5-30-80		
1.2.7-x	Shift and Methanation	11-18-77	5-7-78	9-1-78	5-30-80		
1.2.8-x	Bulk CO ₂ Removal and Gas Compression	11-18-77	5-7-78	9-4-78	5-30-80		
1.2.9-x	Gas Dehydration	11-18-77	5-7-78	9-4-78	4-30-80		
1.2.10-x	Flue Gas Power Recovery	11-18-77	5-22-78	12-1-77	5-30-80		
1.2.11-x	SO ₂ Removal	11-18-77	5-7-78	9-14-78	5-30-80		
1.2.12-x	Sulfur Recovery	11-18-77	5-7-78	9-14-78	5-30-80		
1.2.13-x	Ammonia Recovery	11-18-77	5-7-78	9-14-78	7-31-80		
1.2.14-x	Thermal Oxidizer and Flare	2-7-78	5-22-78	10-2-78	5-30-80		
1.2.15-x	Utilities	11-18-77	5-22-78	9-14-78	5-30-80		
1.2.16-x	Water Supply	1-7-78	4-7-78	9-18-78	4-30-80		
1.2.17-x	Water Treatment Systems	1-7-78	5-7-78	9-18-78	5-30-80		
1.2.18-x	Waste Treatment and Disposal	1-7-78	5-22-78	9-18-78	5-30-80		
1.2.19-x	Fire Protection System	2-7-78	4-7-78	10-9-78	3-31-80		
1.2.20-x	Facilities	2-7-78	5-22-78	9-18-78	5-30-80		
1.2.21-x	Systems	11-18-77	5-22-78	12-1-77	6-30-80		
1.2.22-x	Economic Assessment	11-18-77	5-22-78	3-2-79	4-30-80		
1.2.23-x	Demonstration Plant Design Analysis	11-18-77	5-22-78	9-18-78	5-30-80		
1.3-x	Site Selection and Evaluation	6-7-77	5-22-78	6-7-77			11-30-80
1.4-x	Environmental Analysis	6-7-77	2-7-79	6-7-77			
1.5-x	Feedstock Plans, Licenses, Permits and Easements	6-7-77	2-7-79	7-5-77			
1.9-x	Technical Support	6-7-77	5-7-78	6-7-77			
1.10-x	Long Lead Procurement List	6-7-77	2-7-79	6-18-79			
1.11-x	Project Management	6-7-77	6-6-78	6-7-77	4-30-80		
2.0-p	Final Engineering Design	6-1-78	3-7-79	5-1-80			

Subcontractor		DATES FOR BOTH PLANNED AND ACTUAL ACTIVITY					
ACTIVITY		Master Schedule		Actual Dates (for Past Activities)		Current Outlook (for Future Activity)	
CWBS No.	Name	Start	Complete	Start	Complete	Start	Complete
2.6-p	Definitive Design - Demonstration Plant	3-7-78	2-7-79	9-4-79			
2.6.1-p	Coal Unloading and Handling	3-7-78	2-7-79	9-17-79			
2.6.2-p	Coal Preparation	3-7-78	2-7-79	6-2-80			
2.6.3-p	Pyrolysis and Gasification	3-7-78	2-7-79	5-7-80			
2.6.4-p	Oil Recovery and Treatment	3-7-78	2-7-79	5-1-80			
2.6.5-p	Gas Purification	3-7-78	2-7-79	4-2-80			
2.6.6-p	Hydrogen Generation	3-7-78	2-7-79	4-2-80	-		
2.6.7-p	Shift and Methanation	3-7-78	2-7-79	4-7-80			
2.6.8-p	Bulk CO ₂ Removal and Gas Compression	3-7-78	2-7-79	4-2-80			
2.6.9-p	Gas Dehydration	3-7-78	2-7-79	4-7-80			
2.6.10-p	Flue Gas Power Recovery	3-7-78	2-7-79	5-7-80			
2.6.11-p	SO ₂ Removal	3-7-78	2-7-79	6-2-80			
2.6.12-p	Sulfur Recovery	3-7-78	2-7-79	6-2-80			
2.6.13-p	Ammonia Recovery	3-7-78	2-7-79	7-14-80			
2.6.14-p	Thermal Oxidizer and Flare	3-7-78	2-7-79	6-2-80			
2.6.15-p	Utilities	3-7-78	2-7-79	3-3-80			
2.6.16-p	Water Supply	3-7-78	2-7-79	9-4-79			
2.6.17-p	Water Treatment Systems	3-7-78	2-7-79	3-3-80			
2.6.18-p	Waste Treatment and Disposal	3-7-78	2-7-79	6-2-80			
2.6.19-p	Fire Protection System	3-7-78	2-7-79	10-1-79			
2.6.20-p	Facilities	3-7-78	2-7-79	9-4-79			
2.6.21-p	Systems	3-7-78	2-7-79	9-24-79			
2.7-p	Construction Planning	8-7-78	2-7-79	8-25-80			
2.8-x	Economic Reassessment	10-7-78	2-7-79	8-1-80			
2.9-p	Technical Support (As Required)	-	-				
2.10-p	Long Lead Procurement (As Required)	-	-				
2.11-p	Project Management	6-7-78	3-7-79	5-1-80			

ENGINEERING CHANGE PROPOSAL (ECP) SUMMARY FORM

Illinois Coal Gasification Group

Pipeline Gas Demonstration Plant Program

STATUS ON August 31, 1980

ECP NO.	TITLE	Area	STATUS*	DATE SUBMITTED	DATE APPROVED BY CCB	CONTRACT AMENDMENT		IMPACT		SWBS ELEMENTS AFFECTED
						DATE	NO.	ΔCOST \$000	ΔCOMPLETION DATE FOR LEVEL I	
D001**	Gas Purification	205	A	2-21-80	3-5-80	-	-	-	-	1.2.5
D002**	Oil Treatment	204B	A	2-28-80	3-21-80	-	-	-	-	1.2.4
D003**	Coal Preparation	202	A	6-19-80	6-25-80	-	-	-	-	1.2.2
D004**	Hydrogen Generation	206	A	2-26-80	3-5-80	-	-	-	-	1.2.6
D005**	Bulk CO2 Removal and Gas Compression	208	A	2-21-80	3-5-80	-	-	-	-	1.2.8
D006**	Gas Dehydration	209	A	2-21-80	3-5-80	-	-	-	-	1.2.9
D007**	Shift and Methanation	207	A	2-26-80	3-5-80	-	-	-	-	1.2.7
D008**	Pyrolysis and Gasification	203	A	3-21-80	3-21-80	-	-	-	-	1.2.3
D009**	Oil Recovery	204A	A	6-19-80	6-25-80	-	-	-	-	1.2.4
D010**	Flue Gas Power Recovery	210	A	3-21-80	3-21-80	-	-	-	-	1.2.10
D011**	SO2 Removal	211	A	6-19-80	6-25-80	-	-	-	-	1.2.11
D012**	Sulfur Recovery	212	A	6-19-80	6-25-80	-	-	-	-	1.2.12
D013**	Ammonia Recovery	213	S	7-09-80	8-05-80	-	-	-	-	1.2.13
D014**	Thermal Oxidizer and Flare	214	A	6-19-80	6-25-80	-	-	-	-	1.2.14
D015**	Waste Treatment & Disposal	218	A	6-19-80	6-25-80	-	-	-	-	1.2.18
D016**	Coal Unloading & Handling	201	P							1.2.1
D017**	Utilities	215	P							1.2.15
D018**	Water Supply	216	P							1.2.16
D019**	Water Treatment Systems	217	P							1.2.17
D020**	Fire Protection System	219	P							1.2.19
D021**	Facilities	220	P							1.2.20

*STATUS - ENTER ONE LETTER ** Baseline Document

(I) INCORPORATED BY A
CONTRACT AMENDMENT

(A) APPROVED BY CCB

(S) SUBMITTED

(P) PLANNED

CUMULATIVE COST IMPACTS

_____	TOTAL OF ALL ECP'S INCORPORATED
_____	INCLUDING THOSE APPROVED BY CCB
_____	INCLUDING THOSE SUBMITTED
_____	INCLUDING THOSE PLANNED

ENGINEERING CHANGE PROPOSAL (ECP) SUMMARY FORM

Illinois Coal Gasification Group

Pipeline Gas Demonstration Plant Program

STATUS ON August 31, 1980

ECP NO.	TITLE	CLASS	STATUS*	DATE SUBMITTED	DATE APPROVED	CONTRACT AMENDMENT		IMPACT		SWBS ELEMENTS AFFECTED
						DATE	NO.	ΔCOST \$000	ΔCOMPLETION DATE FOR LEVEL 1	
D022	Hydrogen Gen.	II	A	6-06-80	6-10-80	NA	NA	(20,000)		2.6.6
D023	Regeneration Reboiler	II	A	6-17-80	6-21-80	NA	NA	12,840		2.6.8
D024	Lean Solution Flash Tank	II	A	6-17-80	6-21-80	NA	NA	3,640		2.6.8
D025	Remove Coal Prep Bin	II	P							
D026	Clarifications and Corrections Area 205	II	A	7-10-80	7-18-80	NA	NA	--		2.6.5
D027	Clarifications and Corrections Area 205	II	A	7-10-80	7-18-80	NA	NA	1,500		2.6.5
D028	Combine Coal Elev.	II	P	CANCELLED						
D029	Remove Grinder Feeder	II	P	CANCELLED						
D030	Add Coal Hopper Convey	II	P							
D031	P & ID Revisions	II	A	7-10-80	7-18-80	NA	NA	--		2.6.9
D032	Coal Handling	I	P	7-23-80						
I001	Relief Valves	I	D	7-18-80	8-05-80			1,800,000		
I002	Eliminate Desulfurizer	I	P	8-11-80		NA	NA	(710,000)		2.6.6
D033	Waste Treatment	I	P	8-19-80		NA	NA	(65,200)		2.6.18
D034	Lime Soda Softening	I	P	8-19-80		NA	NA	(143,000)		2.6.18
C001	Water Wash Pyrolyzer	I	P	8-25-80		NA	NA			
C002	Pyrolyzer D Mat'l.	I	P	8-12-80		NA	NA			
C003	Oil Decanter IV	II	P	8-12-80		NA	NA			
C004	Gasifier Bed	II	P							

*STATUS - ENTER ONE LETTER

(I) INCORPORATED BY A CONTRACT AMENDMENT (D) Disapproved

(A) APPROVED BY CCB

(S) SUBMITTED

(P) PLANNED

CUMULATIVE COST IMPACTS

_____	TOTAL OF ALL ECP'S INCORPORATED
(2,020)	INCLUDING THOSE APPROVED BY CCB
_____	INCLUDING THOSE SUBMITTED
(202,130)	INCLUDING THOSE PLANNED