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HEALY CLEAN COAL PROJECT

QUARTERLY TECHNICAL PROGRESS REPORT
No. 16 - 19

FOR THE PERIOD
OCTOBER 1, 1994 THROUGH SEPTEMBER 30, 1995

U.S. DEPARTMENT OF ENERGY COOPERATIVE AGREEMENT
DE-FE-22-91PC90544

ALASKA INDUSTRIAL DEVELOPMENT AND EXPORT AUTHORITY

Patents Cleared By Chicago 10/11/95

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SECTION 1 - SUMMARY

Please refer to Quarterly Technical Progress Report No. 1, January 1, to June 30, 1991, for the project background and objectives for the Healy Clean Coal Project (HCCP). The report presented in the following text contains Quarterly Technical Progress Reports (Numbering 16 through 19) for the fiscal year 1995.

The plant design is finalized and all Federal and State permit have been obtained for construction of the project. Construction of the project is on schedule and is within the budget established following the award of contract. Off-site manufacturing of equipment, including combustor supply and flue gas desulfurization system supply, is progressing on schedule and as budgeted.

The combined Quarterly Technical Progress Report will summarize the significant project development steps since Quarterly Report No. 15 (July 1, - September 30, 1994). The information is derived from the monthly reports, which are a more detailed chronology of events. The report concludes with a forecast of activities for the period of October 1, 1995 through December 31, 1995.

Acronyms and Abbreviations

AIDEA	Alaska Industrial Development and Export Authority
AK	Alaska
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
FWEC	Foster Wheeler Energy Corporation
GVEA	Golden Valley Electric Association, Inc.
HC Price	H.C. Price Company
HCCP	Healy Clean Coal Project
Joy	Joy Technologies, Inc.
NEPA	National Environmental Policy Act
NPDES	National Pollution Discharge Elimination System
No	Number
OCIP	Owner Controlled Insurance Program
SCA	Sumitomo Corporation of America
SWEC	Stone and Webster Engineering Corporation
TRW	TRW, Inc.
UCM	Usibelli Coal Mine, Inc.

SECTION 2 - INTRODUCTION

This Quarterly Technical Progress Report is required under U.S. Department of Energy (DOE) Cooperative Agreement, Section XV, "Reporting Requirements" and Attachment C, "Federal Assistance Reporting Checklist". It covers the period of October 1, 1994 through September 30, 1995.

The primary objective of the HCCP is to conduct a cost-sharing project that will demonstrate a new power plant design which features innovative integration of an advanced combustor and heat recovery system coupled with both high and low temperature emission control processes. The parties anticipate that if the demonstration project is successful, the technology could become commercialized in the near term and will be capable of (1) achieving significant reductions in the emissions of sulfur dioxide and the oxides of nitrogen from existing facilities to minimize environmental impacts such as transboundary and interstate pollution and/or (2) providing for future energy needs in an environmentally acceptable manner.

The primary equipment elements comprising this new power plant design includes entrained combustion systems coupled with a boiler which will produce low NO_x levels, function as a limestone calciner and first stage SO₂ remover in addition to its heat recovery function; a single spray dryer absorber vessel for second stage sulfur removal; a baghouse for third stage sulfur and particulate removal; and a lime activation system which recovers unused reagent from particulate collected in the baghouse. The emission levels of SO₂, NO_x, and particulate to be demonstrated are expected to be better than the federal New Source Performance Standards (NSPS).

The HCCP will be a 50 megawatt, coal-fired power plant that will be built adjacent to the existing 25 megawatt Healy No. 1 plant which is owned and operated by Golden Valley Electric Association (GVEA). The scope of the project consists of a power plant utilizing a combustion system that burns coal in stages.

The Alaska Industrial Development and Export Authority (AIDEA), will administer state funds, perform as the DOE grant recipient, and finance and own the project through advance funding and the sale of bonds; DOE will provide grant funding to demonstrate advanced coal utilization technologies; AIDEA has assembled a team to design, build, supply coal, and operate the HCCP generating facility; GVEA, a member-owned cooperative electric utility which provides generation, transmission and distribution service to the Fairbanks area, will operate the facility under an agreement with AIDEA and will pay for power generated. Usibelli Coal Mine will furnish coal to GVEA; Stone and Webster Engineering Corporation will provide overall project engineering and management services;

TRW and Joy will provide technology related to engineering and design; and Foster Wheeler Energy Corporation will provide combustor expertise.

Construction of the project began in May of 1995. During the summer of 1995, earthwork, foundation and structural steel work was performed. No construction will be done during the late fall and winter of 1995, and construction will begin again in the spring of 1996. Startup testing will be complete by January of 1998, which will begin the demonstration testing period.

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SECTION 3 - PROJECT STATUS

PROJECT MANAGEMENT

The Healy Clean Coal Project (HCCP) team participants and their primary roles include:

- Alaska Industrial Development and Export Authority (AIDEA) - Ownership, overall project management, and financing.
- Golden Valley Electric Association, Inc. (GVEA) - Design input and review, operator and purchaser of the HCCP electrical output.
- Usibelli Coal Mine, Inc. (UCM) - Design input and review, coal supplier and ash disposal.
- TRW, Inc. (TRW) - Entrained combustion system technology supplier.
- Joy Technologies, Inc. (Joy) - Spray dryer, fabric filter, and ash recycle system technology supplier.
- Stone and Webster Engineering Corporation (SWEC) - Architect/Engineer.

In addition, Foster Wheeler Energy Corporation (FWEC) has been contracted for design and supply of the boiler. Sumitomo Corporation of America (SCA) has been contracted for design and supply of the turbine/generator. H.C. Price Company (H.C. Price) has been contracted for general construction of the project.

AIDEA is leading the construction management effort with staff located in Anchorage and a project team located at the jobsite to manage the site construction effort; administer all field services, supplier contracts, and material purchase orders; and provide direct construction coordination with the general contractor. AIDEA has retained an individual, Mr. Clive Herrington, who has extensive international experience in power plant construction. Mr. Herrington is assisted by staff from AIDEA and technical specialists from SWEC having backgrounds suited for work in progress. In addition, support is provided as required from the SWEC office in Denver, Colorado and off-site fabricators of components.

The required monthly reporting under the terms of the Cooperative Agreement, Article XV, reporting requirements was fulfilled during this reporting period.

QUARTERLY REPORT SUMMARY OF ACTIVITIES

Quarterly Report 16: October 1, 1994 - December 30, 1994

Significant Activities:

- General construction bidding documents, advertised for bid August 1, 1994, were received November 3, 1994. The seven (7) bids ranged from \$83.2 million to \$114.2 million. The low bid was presented by H.C. Price Company.
- The low general construction bid was approximately \$25 million over the engineer's estimate of \$58,114,000. Project participants offered over \$14 million in contributions to offset the deficit.
- A contract was awarded to H.C. Price for \$83.2 million on December 22, 1995.
- Permit activities: Final National Pollution Discharge Elimination System (NPDES) permit was received December 23, 1995 and became effective beginning January 24, 1995. All other permits had previously been obtained.

Quarterly Report 17: January 1, 1995 - March 30, 1995

Significant Activities:

- A limited Notice to Proceed was issued to H.C. Price, the General Construction Contractor, on January 11, 1995, for critical path materials, equipment, and services in order to maintain H.C. Price's schedule, and full release of the General Contractor was issued by Notice to Proceed on January 31, 1995.
- TRW was released to begin fabrication of the combustors on February 10, 1995, and FWEC was released for fabrication of the boiler on February 14, 1995.
- Joy was released for fabrication of the flue gas desulfurization system on March 10, 1995; Sumitomo Corporation of America was released for fabrication of the turbine generator on March 30, 1995; and the other suppliers of Owner furnished equipment are being released to begin

fabrication/production as they complete their Manufacture and Inspection Plans and Quality Assurance Program requirements.

- AIDEA and GVEA executed two agreements, one covering the rights and obligations of the parties for use of the Site during construction, start-up, and demonstration testing and the other covering the ground lease for the HCCP Site.
- Construction camp mobilization began.

Quarterly Report 18: April 1, 1994 - June 30, 1995

Significant Activities:

- The plant design is finalized and all Federal and State permit related activities have been completed, and all permits necessary for the construction of the HCCP have been obtained.
- Key personnel of the AIDEA, SWEC, and GVEA attended the General Contractor Pre-Construction Conference, along with H.C. Price and its major subcontractors, which was held on April 7, 1995, together with the Owner Controlled Insurance Program (OCIP) Conference. On April 10 and 11, 1995, a partnering training session was held for key personnel of AIDEA and H.C. Price and some of its subcontractors.
- Civil construction starting with earthwork and foundation preparations began in early May, 1995 at the HCCP Site. By the end of June, nearly 4,000 cubic yards of concrete were placed and over 25,000 cubic yards of structural backfill hauled and compacted.
- H.C. Price has finalized its first tier subcontracts, and work started related to procuring equipment and materials.
- Construction of the construction housing facility and the Project office complex were completed.
- A celebration of the start of construction took place in Healy on May 30. Alaska Governor Tony Knowles, U.S. Senators Murkowski and Stevens, Alan Edwards representing DOE, project participants, state and federal officials and business leaders, and the community of Healy attended the celebration and lunch. Considerable positive press on the benefits of the HCCP was

generated. Total attendance at the Celebration was estimated at 630, which included all the local students.

Quarterly Report 19: July 1, 1995 - September 30, 1995

- The schedule for general construction of the Project shows construction complete in August of 1997, with startup activity concluding in December of 1997. Demonstration testing will begin in January of 1998. Construction progress is on schedule, with the site work complete and steel framing 25 percent complete. On-site construction ceased in November of 1995 for the winter, and will restart in March of 1996. The building shell will be enclosed in 1996 allowing construction progress to continue uninterrupted through the winter of 1996. Off-site manufacturing of power plant components, including the combustion and flue gas desulfurization systems, is on schedule.
- The construction process is within budget, with the contractor receiving \$28,690,600 (through September 30, 1995) in progress payments towards the contract total of \$83,246,191. Off-site manufacturing of equipment is progressing within amounts budgeted.
- The formation of the HCCP Disputes Review Board was completed in July, and the first meeting of the Board was held at the Site on July 21, 1995.
- Construction meetings are held weekly with H.C. Price to review its construction schedule and progress, interface owner furnished equipment fabrication schedules, and to coordinate with Joy, TRW, SCA, and FWEC, respectively, for the flue gas desulfurization system, combustors, turbine, and boiler deliveries and erection activities with general construction activities.
- The State Fire Marshal has required that modifications be made to the facility. Meetings are being held with the Fire Marshal and other involved parties in an attempt to mitigate certain costs and the amount of fireproofing required. Change Order No. 1 covering all related changes, except fireproofing, will be issued based upon an agreed to amount of \$825,000, and a separate Change Order covering the fireproofing modifications will be finalized when an agreement is reached.
- Changes to the erection portions of the FWEC and SCA contracts are being considered which would transfer this work to the General Contractor. The evaluation will consider risk reduction and cost containment measures.
- Earthwork and foundations preparation have been completed and the structural concrete was completed in September. Structural steel erection began on August 16, 1995 and over 20% of the steel was erected by the end of September.

SECTION 4: PLANS FOR NEXT QUARTER (OCTOBER - DECEMBER 1995)

Activities planned for next quarter include the following:

SUMMARY: Structural steel erection is scheduled to continue through mid-October, at which time construction activities will slow and the project will be prepared to close down for the winter months. Construction activities will resume in the Spring of 1996.

AIDEA

- Continued oversight of project construction and project management. Materials for the 1996 construction season will be shipped to the project site during the Spring of 1996.

Environmental

- All state and federal permits have been acquired and AIDEA remains in compliance.

TRW

- Engineering and design of the combustor systems are complete and fabrication is in process. Combustor systems will be installed as part of the boiler erection during the 1996 and 1997 construction seasons. Delivery on site is scheduled for May of 1996.

FWEC

- Engineering and design of the boiler system is complete and fabrication is in process. Boiler system will be delivered in June of 1996 and installed during the 1996 and 1997 construction seasons.

Joy

Engineering and design of the spray dryer absorber and ash recycle system is complete and fabrication is in process. Delivery will occur during February 1996 and installation will occur during the 1996 and 1997 construction seasons.

SCA

- Turbine, turbine auxiliary and piping, generator, embedded materials, electrical equipment, and instrumentation design is complete and fabrication

is in process. Delivery will occur in August of 1996 and installation will follow soon thereafter.

SWEC

- Continues to perform construction phase activities, which include reviewing vendor submittals, responding to requests for information from the contractor, and construction inspection.

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Activity ID	Activity Description	Orig Dur	Plan Dur	%	Early Start	Early Finish	Late Start	Late Finish	Total Float
110005	UNIT #1 SHUTDOWN - SUMMER 1996	53	53	100	16NOV94	29JUL96	16NOV94	30SEP96	54
110010	ANTICIPATED UNIT #1 SHUTDOWN - 1997	18	18	0	07MAR97	15AUG96	15JUN96	27MAR97	0
110000	OPERATIONS TESTING	01	01	0	08JUL97	21NOV97	17SEP97	31DEC97	34
110000	WORK COMPLETIONS	01	01	0	08JUL97	21NOV97	17SEP97	31DEC97	34
110000	1995 MECHANICAL WORK COMPLETE	1	1	0	03OCT95	03OCT95	14OCT95	14OCT95	10
110000	1995 CIVIL WORK COMPLETE	1	1	0	03OCT95	03OCT95	30OCT95	30OCT95	18
110000	1995 STRUCT CONCRETE ACTIV COMPLETE	1	1	0	03OCT95	03OCT95	30SEP95	30SEP95	-4
110000	1995 STRUCTURAL STEEL ACTIV COMPLETE	1	1	0	03OCT95	03OCT95	28OCT95	28OCT95	7
110000	1995 OTHER STRUCTURAL ACTIV COMPLETE	1	1	0	04NOV95	04NOV95	28OCT95	28OCT95	-6
110000	1995 ELECTRICAL WORK COMPLETE	1	1	0	20NOV95	20NOV95	31OCT95	31OCT95	-17
110000	1996 MAJOR STRUC STEEL ACTIV COMPL (CEPT	1	1	0	20JUL96	20JUL96	21AUG96	21AUG96	27
110000	1996 CIVIL WORK COMPLETE	1	1	0	02OCT96	02OCT96	15OCT96	15OCT96	11
110000	1996 STRUCT CONCRETE ACTIV COMPLETE	1	1	0	28OCT96	28OCT96	31OCT96	31OCT96	0
110000	1996 OTHER STRUCTURAL ACTIVITIES COMPLETE	1	1	0	30NOV96	30NOV96	09AUG97	07AUG97	215
110000	1996/97 ALL STRUCTURAL STEEL COMPLETE	0	0	0	05MAR97	05MAR97	08MAR97	08MAR97	3
110000	1996/97 INSTRUM CAVINSTALL - ALL SYSTEMS COMPLETE	0	0	0	19MAR97	19MAR97	07AUG97	07AUG97	121
110000	1996/97 ARCH ACTIVITIES COMPLETE	1	1	0	23JUN97	23JUN97	07AUG97	07AUG97	39
110000	ALL SYSTEM TUNOVERS COMPLETE	0	0	0	28JUN97	28JUN97	15SEP97	15SEP97	67
110000	1997 CIVIL WORK COMPLETE	1	1	0	12JUL97	12JUL97	07AUG97	07AUG97	22
110000	CONTRACTOR MILESTONES	0	0	0	15JAN95A	30JUN95A	15JAN95A	30JUN95A	0
110000	MOBILIZE AT JOBSITE	0	0	100	15JAN95A	30JUN95A	15JAN95A	30JUN95A	0
110000	CAMP READY FOR ALL CONTRACTORS (LD)	0	0	100	30JUN95A	30JUN95A	30JUN95A	30JUN95A	0
110000	CONST. POWER READY FOR PRELOADING (LD)	0	0	100	30JUN95A	30JUN95A	30JUN95A	30JUN95A	0
110000	BOILER STEEL RELEASED FOR PRELOADING (LD)	0	0	0	30SEP95	30SEP95	15APR96	15APR96	169
110000	MOB/ASH AREA READY FOR BOILER CNTR (LD)	0	0	0	03OCT95	03OCT95	15MAR96	15MAR96	141
110000	SITE/NOB AREA READY FOR TIG CONTRACTOR (LD)	0	0	0	09OCT95	01JUN96	01JUN96	01JUN96	203
110000	ACCESS READY FOR GEN STATOR SETTING (LD)	0	0	0	18MAY96	18MAY96	01JUN96	01JUN96	12
110000	TURBINE BUILDING BRIDGE CRANE READY (LD)	0	0	0	11JUN96	11JUN96	31AUG96	31AUG96	71
110000	TURBINE PEDESTAL READY FOR TURBINE ERECTION	0	0	0	24JUL96	24JUL96	15AUG96	15AUG96	41
110000	CONDENSOR FRID READY FOR CONDENSOR ERECTION	0	0	0	24JUL96	24JUL96	07AUG96	07AUG96	19
110000	TURBINE AUX EOP FRID READY FOR AUX EOP	0	0	0	10AUG96	10AUG96	31AUG96	31AUG96	33
110000	TURBINE UNIT #1 COAL HANDLING	0	0	0	16SEP96	16SEP96	01OCT96	01OCT96	11
110000	RELEASE BOILER BLDG FOR LEAVE OUT STEEL	0	0	0	01OCT96	01OCT96	01OCT96	01OCT96	0
110000	BOILER BUILDING ENCLOSED (LD)	0	0	0	10OCT96	10OCT96	01NOV96	01NOV96	19
110000	TURNOVER MAIN PLANT ELECTRICAL SYSTEMS (LD)	0	0	0	17DEC96	17DEC96	30NOV96	30NOV96	36
110000	TURNOVER PLANT CONTROL SYSTEM (LD)	0	0	0	01JAN97	01JAN97	15JAN97	15JAN97	23
110000	TURNOVER AIR SYSTEMS (LD)	0	0	0	30JAN97	30JAN97	07FEB97	07FEB97	12
110000	TURNOVER COOLING WATER SYSTEMS (LD)	0	0	0	14FEB97	14FEB97	15MAR97	15MAR97	25
110000	TURNOVER CONDENSATE SYSTEM (LD)	0	0	0	15FEB97	15FEB97	15MAR97	15MAR97	12
110000	TURNOVER PIPING FOR BOILER/COMB HYDRO (LD)	0	0	0	28FEB97	28FEB97	15MAR97	15MAR97	13
110000	TURNOVER FEEDWATER SYSTEM (LD)	0	0	0	12MAR97	12MAR97	07APR97	07APR97	17
110000	TURBINE GENERATOR & COND ERECTION COMPLETE	0	0	0	23APR97	23APR97	30MAY97	30MAY97	33
110000	BOILER BOILOUT COMPLETE (LD)	0	0	0	28APR97	28APR97	07AUG97	07AUG97	02
110000	PIPE SUPPORTING STEAM TO TURBINE COMPLETE	0	0	0	07AUG97	07AUG97	15SEP97	15SEP97	33
110000	STEAM TO TURBINE READY FOR STARTUP	0	0	0	20AUG97	20AUG97	31DEC97	31DEC97	114
110000	CONSTRUCTION COMPLETE (LD)	0	0	0	20AUG97	20AUG97	31DEC97	31DEC97	114
110000	INITIAL OPERATION	0	0	0	29NOV97	29NOV97	31DEC97	31DEC97	34

Activity ID: 110005

Activity Description: UNIT #1 SHUTDOWN - SUMMER 1996

Orig Dur: 53

Plan Dur: 53

%: 100

Early Start: 16NOV94

Early Finish: 29JUL96

Late Start: 16NOV94

Late Finish: 30SEP96

Total Float: 54

1995

1996

1997

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Alaska Industrial Development and Export Authority

Healy Clean Coal Project

IDEA - HEALY CLEAN COAL PROJECT

H.C. PRICE CONSTRUCTION SCHEDULE

Dept Of Energy - September 1995

Sheet 1 of 1

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- AIDEA and GVEA executed two agreements, one covering the rights and obligations of the parties for use of the Site during construction, start-up, and demonstration testing and the other covering the ground lease for the HCCP Site.
- Construction camp mobilization began.

Quarterly Report 18: April 1, 1994 - June 30, 1995

Significant Activities:

- The plant design is finalized and all Federal and State permit related activities have been completed, and all permits necessary for the construction of the HCCP have been obtained.
- Key personnel of the AIDEA, SWEC, and GVEA attended the General Contractor Pre-Construction Conference, along with H.C. Price and its major subcontractors, which was held on April 7, 1995, together with the Owner Controlled Insurance Program (OCIP) Conference. On April 10 and 11, 1995, a partnering training session was held for key personnel of AIDEA and H.C. Price and some of its subcontractors.
- Civil construction starting with earthwork and foundation preparations began in early May, 1995 at the HCCP Site. By the end of June, nearly 4,000 cubic yards of concrete were placed and over 25,000 cubic yards of structural backfill hauled and compacted.
- H.C. Price has finalized its first tier subcontracts, and work started related to procuring equipment and materials.
- Construction of the construction housing facility and the Project office complex were completed.
- A celebration of the start of construction took place in Healy on May 30. Alaska Governor Tony Knowles, U.S. Senators Murkowski and Stevens, Alan Edwards representing DOE, project participants, state and federal officials and business leaders, and the community of Healy attended the celebration and lunch. Considerable positive press on the benefits of the HCCP was

generated. Total attendance at the Celebration was estimated at 630, which included all the local students.

Quarterly Report 19: July 1, 1995 - September 30, 1995

- The schedule for general construction of the Project shows construction complete in August of 1997, with startup activity concluding in December of 1997. Demonstration testing will begin in January of 1998. Construction progress is on schedule, with the site work complete and steel framing 25 percent complete. On-site construction ceased in November of 1995 for the winter, and will restart in March of 1996. The building shell will be enclosed in 1996 allowing construction progress to continue uninterrupted through the winter of 1996. Off-site manufacturing of power plant components, including the combustion and flue gas desulfurization systems, is on schedule.
- The construction process is within budget, with the contractor receiving \$28,690,600 (through September 30, 1995) in progress payments towards the contract total of \$83,246,191. Off-site manufacturing of equipment is progressing within amounts budgeted.
- The formation of the HCCP Disputes Review Board was completed in July, and the first meeting of the Board was held at the Site on July 21, 1995.
- Construction meetings are held weekly with H.C. Price to review its construction schedule and progress, interface owner furnished equipment fabrication schedules, and to coordinate with Joy, TRW, SCA, and FWEC, respectively, for the flue gas desulfurization system, combustors, turbine, and boiler deliveries and erection activities with general construction activities.
- The State Fire Marshal has required that modifications be made to the facility. Meetings are being held with the Fire Marshal and other involved parties in an attempt to mitigate certain costs and the amount of fireproofing required. Change Order No. 1 covering all related changes, except fireproofing, will be issued based upon an agreed to amount of \$825,000, and a separate Change Order covering the fireproofing modifications will be finalized when an agreement is reached.
- Changes to the erection portions of the FWEC and SCA contracts are being considered which would transfer this work to the General Contractor. The evaluation will consider risk reduction and cost containment measures.
- Earthwork and foundations preparation have been completed and the structural concrete was completed in September. Structural steel erection began on August 16, 1995 and over 20% of the steel was erected by the end of September.

SECTION 4: PLANS FOR NEXT QUARTER (OCTOBER - DECEMBER 1995)

Activities planned for next quarter include the following:

SUMMARY: Structural steel erection is scheduled to continue through mid-October, at which time construction activities will slow and the project will be prepared to close down for the winter months. Construction activities will resume in the Spring of 1996.

AIDEA

- Continued oversight of project construction and project management. Materials for the 1996 construction season will be shipped to the project site during the Spring of 1996.

Environmental

- All state and federal permits have been acquired and AIDEA remains in compliance.

TRW

- Engineering and design of the combustor systems are complete and fabrication is in process. Combustor systems will be installed as part of the boiler erection during the 1996 and 1997 construction seasons. Delivery on site is scheduled for May of 1996.

FWEC

- Engineering and design of the boiler system is complete and fabrication is in process. Boiler system will be delivered in June of 1996 and installed during the 1996 and 1997 construction seasons.

Joy

Engineering and design of the spray dryer absorber and ash recycle system is complete and fabrication is in process. Delivery will occur during February 1996 and installation will occur during the 1996 and 1997 construction seasons.

SCA

- Turbine, turbine auxiliary and piping, generator, embedded materials, electrical equipment, and instrumentation design is complete and fabrication

is in process. Delivery will occur in August of 1996 and installation will follow soon thereafter.

SWEC

- Continues to perform construction phase activities, which include reviewing vendor submittals, responding to requests for information from the contractor, and construction inspection.

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