Final Start-up Modifications Report
for the
JEA Large-Scale CFB Combustion Demonstration Project

Submitted to
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1.0 OVERVIEW

JEA is the largest public power company in Florida and the eighth largest public power company in the US. JEA currently serves nearly 350,000 customers and is experiencing a load growth rate of more than 3% per year. Prior to the JEA Large-Scale CFB Demonstration Project, JEA's Northside Generating Station (NGS) consisted of three oil/gas-fired steam electric generating units. Units 1 and 2 were each nominally rated at 275 megawatts (MW) and Unit 3 at 518 MW. Units 1 and 3 had been in service since 1966 and 1977 respectively. Unit 2 was completed in 1972, but had been inoperable since about 1983 due to major boiler problems.

In September 1997, the U.S. Department of Energy (DOE) and JEA entered into an agreement to repower JEA's Northside Generating Station Unit 2 with CFB boiler technology from Foster Wheeler. The purpose of this agreement was to demonstrate CFB technology for coal firing in large-scale applications while providing increased plant electric output, reduced emissions and broad fuel flexibility.

The DOE is contributing approximately $73 million from the Clean Coal Technology Program for repowering Unit 2, with JEA providing the remainder of the total budget. The DOE cost sharing includes two years of demonstration test runs for Unit 2, during which both coal and coal/petroleum coke blends will be fired. Although the DOE participation was only in the Unit 2 and Common Facilities portion of the project, the project execution by JEA included design and construction for repowering of Unit 1 with an identical CFB boiler in the same time frame. The DOE did not cost share in the Unit 1 repowering.

A previously published DOE report entitled "Detailed Public Design Report" summarized the non-proprietary design information for the project in some detail. Project design activities for both units were essentially complete by July 2001, although some design changes were made during the latter stages of construction and start-up.

Initial synchronization of Unit 2 occurred on February 19, 2002, and initial synchronization of Unit 1 occurred on May 29, 2002. Additional schedule information is provided in the Project Milestone Schedule in Appendix 4.

A list of the abbreviations used in this report is contained in Appendix 5.

The purpose of this report is to document any equipment or process modifications made to Unit 2 as a result of late design changes or deficiencies encountered during commissioning and start-up activities. This report is primarily for Unit 2 and Common Facilities, but it contains some summary type information for the entire Unit 1 and 2 Repowering Project.

2.0 PROJECT SCOPE

The project involved the construction and operation of two CFB boilers, one for Unit 2 and one for Unit 1, fueled by coal and petroleum coke to repower two existing steam turbines, each generating nearly 300 MW. CFB boilers are generally capable of removing over 98% of SO_2. However, to improve the overall economics and environmental performance, a polishing scrubber was included to minimize reagent consumption while firing petroleum coke containing up to 8.0% sulfur. The relatively low furnace operating temperature of about 1600° F inherently results in appreciably lower nitrogen oxide emissions compared to conventional coal-fired power plants. However, the project also included a new selective non-catalytic reduction (SNCR) system to further reduce emissions of nitrogen oxides. Over 99.8% of particulate emissions are removed by a baghouse.

In addition to the CFB combustor and the air pollution control systems, new equipment for the project included a chimney as well as handling systems for fuel, limestone, and ash. The project also required overhaul and/or upgrades of existing systems such as the steam turbines, condensate and feedwater systems, circulating water systems, water treatment systems, plant electrical distribution systems, the switchyard, and the plant control systems.

New construction associated with the Repowering Project occupies approximately seventy-five acres of land at the Northside Generating Station. Solid fuel delivery to the site required new receiving, handling, and storage facilities. Limestone and ash storage and handling facilities were also required. Wherever possible, existing facilities and infrastructure were used for the project. These include the intake and discharge system for cooling water, the wastewater treatment system, and the electric transmission lines and towers.

Project activities include engineering and design, permitting, equipment procurement, construction, start-up, and a twenty-four month demonstration of the commercial feasibility of the technology. During the two year demonstration period, Unit 2 will be operated on several different types of coal and coal/petroleum coke blends to enhance the viability of the technology. Upon completion of the demonstration program for the DOE, Unit 2 will continue in commercial operation.

3.0 START-UP

Foster Wheeler (FW) was responsible for the commissioning and start-up of the boiler and AQCS systems, and Zachry Construction Corp (ZCC) was responsible for the commissioning and start-up of Balance of Plant (BOP) systems. The JEA Start-up Group was responsible for the overall coordination of plant start-up, as well as commissioning and start-up of the Material Handling Systems (coal, petroleum coke, and limestone), and of the turbine/generator and related auxiliary systems. JEA Operations was responsible for operation of completed and integrated systems after turnover of the various systems for normal operation.

Foster Wheeler (FW) began on-site staffing for the commissioning and start-up activities for the FW scope of work for the project in the latter part of 2000. The FW monthly progress reports for the project began including a separate section on "Commissioning and Startup" in Report No. 23 for the period of October 28, 2000 through November 24, 2000. The Commissioning and Startup section from each of the FW Progress Reports, from Report No. 23 through Report No. 41, are included in Appendix 1 for information and reference purposes.

Pre-boiler chemical cleaning of the Unit 2 condensate and feedwater systems (excluding boiler systems) was completed in early June 2001. Chemical cleaning of the Unit 2 boiler was completed in September 2001. First fire of Unit 2 on gas occurred on December 1, 2001, and Unit 2 steam blows were completed on January 15, 2002. Beginning in December 2001, the JEA Start-up Group published Start-up Update Reports periodically to document the status of start-up of Unit 2 (and Unit 1). These Update Reports, from December 2001 through August 2002, are included in Appendix 2 for information and reference purposes.

Since August 2002, JEA has been working on resolution of operational shortcomings and refinement of operating characteristics associated with the boiler and AQCS systems. Numerous Phase 1 completion modifications were implemented by JEA during a Spring 2003 outage on Unit 2 to optimize performance during the summer peak period. JEA is planning to conduct final boiler performance tests in the Spring of 2004, and the DOE demonstration tests are planned to be completed over the following two years.

3.1 Modifications During Start-up

As indicated above, the detailed design activities for the project were essentially complete by July 2001, but some design changes and scope additions were made during the latter stages of construction and start-up. Many of these changes were issued due to scope increases or changes requested by JEA, field conditions that differed from the design basis (due to missing or incorrect vendor data, incorrect field data, etc), drawing errors, etc. Other changes were identified and implemented during start-up and initial operation of various integrated systems and initial operation of Unit 2 by JEA. Significant modifications which were required as a result of Unit 2 start-up and testing activities are described in Appendix 3. These modifications are separated into four categories, by the prefix on the Modification Number, as follows:

Modification Number Prefix	Category Description
FW-	Modifications by FW
BV-	Modifications issued by B&V
JEA-	JEA Modifications prior to Phase 1 Completion Items
JEA WTS	JEA Phase 1 Completion Modifications

Modifications on the FW scope of the project were issued by FW or its subcontractors in the form of revised drawings and specifications to their construction forces for implementation. Significant

start-up modifications to the FW scope for Unit 2 and Common Systems are included in Appendix 3.

Design changes, scope additions, and start-up modifications for the Balance of Plant (BOP) and Common Systems for which B&V had detailed design responsibility were issued to the appropriate contractors either by issuance of revised drawings, issuance of an Engineering Change Notice (ECN), or issuance of a Work Package (WP). Significant start-up modifications to BOP and Common Systems which were required as a result of Unit 2 start-up and testing activities are listed in Appendix 3.

After August 2002, JEA initiated a number of modifications and changes that could be implemented quickly, with little or no down time, to improve the operation of the Unit 2 boiler and AQCS systems. In addition, JEA developed a more comprehensive list of design modifications and changes which could be completed during a scheduled outage in the Spring of 2003, which are referred to as Phase 1 Completion Modifications. The significant start-up modifications implemented by JEA for Unit 2 since September 2002 are also listed in Appendix 3.

3.2 Start-up Modification Costs

The cost for each start-up modification is also indicated in Appendix 3 to the extent the costs associated with each start-up modification are identifiable. In many cases, the costs associated with a given modification are included in the overall project cost, but are not separately identifiable. The total of the costs identified in Appendix 3 is about $9,080,000.

APPENDIX 1

COMMISSIONING AND START-UP SECTIONS FROM FOSTER WHEELER MONTHLY PROGRESS REPORTS

Foster Wheeler (FW) began on-site staffing for the commissioning and start-up activities for the FW scope of work for the project in the latter part of 2000. The FW monthly progress reports for the project began including a separate section on Commissioning and Start-up in Report No. 23 for the period of October 28, 2000 through November 24, 2000. The Commissioning and Startup section from each of the FW Progress Reports, from Report No. 23 through Report No. 41 are included in this appendix for information and reference purposes. Note that the report number and report period have been added in italics at the beginning of each monthly section.

Some of the abbreviations used in these report sections are defined below for clarification purposes.

ABB	JEA's DCS supplier
BIEB	Boiler Island Electrical Building
CEMS	Continuous Emissions Monitoring System
ETI	Electro Test Inc., the FW subcontractor for electrical testing
FAT	Factory Acceptance Test
FCS	Fossil Consulting Services, the FW training subcontractor
KVB	The FW subcontractor for the CEMS
PSC	Preliminary Substantial Completion
R&S	Roberts & Schaeffer, the FW subcontractor for the Limestone Preparation System
SDA	Spray Dryer Absorber
SECO	The FW subcontractor for electrical construction work
SJRPP	Saint Johns River Power Park, adjacent to the Northside site
SOP	System Operating Procedure
UCC	United Conveyor Corp, the FW subcontractor for the ash handling systems
WAPC	Wheelabrator Air Pollution Control, the FW subcontractor for the Air Quality Control System
ZCC	Zachry Construction Corp, the JEA Alliance Contractor responsible for the Balance of Plant work scope

V. COMMISSIONING AND STARTUP *(From FW Progress Report No. 23, October 28, 2000 through November 24, 2000)*

FWPS Home Office personnel continued their review of all appropriate documentation and initiated the development of various site-specific commissioning and startup documents and programs.

The project Commissioning Manager, Tyler James, was permanently assigned to the JEA project 11/1/00, working out of the NJ office. Tyler will relocate to the site by 12/8/00. While in NJ, time has been spent reviewing project correspondence, relative documents (Drawings, Contract Specs., Air permit, EPC Contract, Requisitions etc.), meeting with project people, revising the Startup Manual, scoping out subsystems, generating a subsystem list and descriptions, and developing a subsystem commissioning schedule.

Several changes were made to the existing FW Startup Manual to tailor it to the requirements set forth in the contract specifications including, but not limited to, contractor and owner responsibilities, development of new procedures, and miscellaneous text revision.

Each system was scoped out, using P&IDs, and broken down into subsystems for scheduling purposes and to ensure correct sequential turnover and custody transfer of subsystems from Construction to Commissioning. These scoped drawings are included in the Startup Manual, along with the subsystem list and descriptions. Once the scoping was complete, a subsystem commissioning schedule was developed and will be included in the manual. The schedule supports the project milestone target dates. Scheduled PSC and SC milestone dates established are 1 .5 months ahead of the contractual dates and the time span between scheduled milestone dates between unit #2 and unit #1 is 3 months. The Startup Manual, which will also include the commissioning schedule, will be available on 12/11/00. FW will review the manual with JEA Representatives, on site, 12/18 & 12/19. Based on the outcome of the meeting, the Startup Manual will be revised, if necessary, to reflect any Startup Program changes.

FW has reviewed JEA specification 100 and forwarded comments, on the specification, to JEA on 10/24/2000. These comments will be discussed in detail during the 12/18 & 12/19 meeting.

The JEA training program is currently being developed to comply with project specification 300. FW has sent RFPs out to three companies specializing in training program development and expect a preliminary outline and budgetary cost by 12/14. These outside services will be utilized to conduct the specialized training, in addition to vendor training, that the vendors will not provide. The timeframe for the training will be May or June of 2001.

FW is currently reviewing the project cost estimate for the FW scope of supply (Commissioning and Startup Services). The estimate will be finalized soon upon final FW review and revision, and will be available for review at the scheduled meetings with JEA representatives on December 18 & 19.

V. COMMISSIONING AND STARTUP *(From FW Progress Report No. 24, November 25, 2000 through December 29, 2000)*

The project Commissioning Manager arrived on-site 12/8/00. The first week was used to meet with Key FW project people, as well as JEA project personnel. Several meetings were attended throughout the first week to get familiarized with project progress and to get an understanding of "who is doing what" at the job site.

Time was also spent going through JEA Testing Specification 100 to identify all specific electrical, instrument and mechanical tests that must be conducted. Test sheets that FW typically uses, along with those supplied by JEA, were revised, consolidated and tailored to comply with the testing specification. The final set of forms will be included in the Startup Manual. A responsibility matrix will be developed to identify who will be responsible for performing the different test stated in Testing Spec 100. This matrix, along with the specification and applicable test sheets, will be given to FW sub- contractors and FW vendors to insure consistent compliance.

Meetings were held on December 18th, 19th, and 20th with JEA to finalize Spec. 100 language and to agree on how the Startup would be coordinated and conducted. A substantial amount of time was also spent going over Spec. 300, with respect to the specific training format and information requested by JEA.

The SU Manual was presented to, and discussed with, JEA with minor revisions needed. The final revisions will be made within the next week after which, final distribution of the manual can take place.

The SU schedule and cost estimate were also discussed during the meetings. Final changes to the schedule will be made, including incorporating "needed by" dates for all FW out-of-scope activities. JEA will further review the estimate. The estimate could change based on input after the commissioning schedule has been manpower loaded to determine the number of Electrical and 1&C craft people needed throughout the commissioning period. In addition, the cost of testing may increase with FW subcontractors and turnkey suppliers/vendors based on distribution and review of JEA's Testing Specification 100.

Staffing the entire Commissioning team is currently being considered including timeframes for bringing people on-site. Resumes for Mechanical and Electrical SU engineers are being reviewed. Our goal is to have all the lead personnel chosen no later than mid February. Personnel to prepare subsystem commissioning test packages will probably be brought in within the next 4 weeks. Office space for future FW SU personnel is being discussed with JEA. JEA has indicated that they will provide trailer office space, furniture, and office equipment for the FW Commissioning group.

Sub-system scoping drawings and other documents are being used to incorporate GEMS codes into the computerized instrument index and cable and conduit schedule to be used as a tool to assist with conducting and tracking subsystem testing. These databases, if applicable, will also be additions to the turnover packages.

The Unit #1 and #2 stack subsystems have been turned over to JEA, by Construction, for review and signoff.

V. COMMISSIONING AND STARTUP *(From FW Progress Report No. 25, January 1, 2001 through January 26, 2001)*

Revisions to the Startup Manual are complete with distribution expected to take place the week of February 5th.

The Lead Electrical Startup Engineer has been hired and will begin work on February 5th. A Documentation Coordinator has also been hired and will be on-site March 15th. The Document Coordinator's primary role will be to begin collecting drawings, data sheets, and other documentation necessary to assemble test packages for the various subsystems. The Documentation Coordinator will also assist with field commissioning activities since he has a significant amount of power plant operating and startup experience. Resume review and candidate interviews continue to take place to fill commissioning team positions. FW will submit a schedule to JEA showing expected start dates for remaining commissioning team members. The commissioning team will need dedicated office space and supplies by March 15th to effectively begin commissioning activity.

WAPC and R&S Construction Managers were given a copy of the FW commissioning schedule. FW "needed by" dates were discussed and agreed to by both WAPC and R&S. FW asked that the schedules be submitted to their respective Home Offices for review. Each Home Office was asked to submit a detailed commissioning schedule to FW no later that February 23rd.

Foster Wheeler Energy Services Inc. (FWESI) has submitted a draft estimate showing expected manpower requirements for boiler commissioning support within the FWEC scope. FWPS is currently reviewing the estimate and expects it to be finalized by February 13th.

The FW commissioning schedule has been manpower loaded to determine I&C and Electrician craft labor requirements through Substantial Completion. The Startup Estimate will reflect these adjustments as well as all estimated costs from the FWESI estimate.

A responsibility matrix was developed to identify responsibilities associated with compliance of JEA Specification 90.0100. The matrix indicates to vendors and contractors involved, the preoperational testing and documentation requirements agreed to by FW and JEA. This matrix and specification, along with applicable test data sheets, were distributed internally for review and will be given to the vendors and contractors involved.

FWPS has tailored FW Completion Specification 05A1 to the JEA project. This specification indicates internal project responsibilities for each FW group involved as well as any responsibilities that are applicable to JEA. This specification has been distributed for review and will be finalized by FWUSA.

Fossil Consulting Services (FCS) was asked to come to the site to conduct a presentation prior to the JEA training contract being awarded to them. After the presentation, JEA gave their approval to award the contract. FCS will travel to NJ to begin collecting information and has committed to submitting a detailed training schedule by February 21st. On site training is expected to begin on May 1st and finish around June 6th. The Startup Estimate will be adjusted to reflect the firm price quoted by FCS.

At the end of January, FW was working on making appropriate Construction-to-Startup scheduling ties for each system in the FW scope. This information is being given to the project controls group for overall schedule integration.

Preboiler and boiler chemical cleaning procedures are being developed. B&V has issued a specification for preboiler cleaning, which includes piping to be cleaned within the FW scope. JEA is currently reviewing the specification. A copy was also sent to the FW Home Office for review. Initially the thought process was to clean all preboiler piping (ZCC & FW) together. ZCC feels that their piping will be available for

cleaning in April while FW preboiler piping may not be available until June. ZCC prefers to clean their piping ASAP and separately so they have sufficient time to insure that their BFP rework and subsequent pump testing meets expectations and that there is no impact to the schedule. ZCC simply does not want to take the risk of waiting until June to test the motor driven BFP. This issue has not been officially resolved. FW is also working on a procedure for boiler chemical cleaning, which is independent of the preboiler cleaning. FW is also in the process of acquiring quotes for steam blows.

Purchasing protocol and procedures have been put in place for the Commissioning Group. Purchase Orders will be generated at the site. Invoicing will come to the site first for approval and then forwarded to the Home Office for processing. FWCI Terms & Conditions will be used when issuing Purchase Orders.

V. COMMISSIONING AND STARTUP *(From FW Progress Report No. 26, January 27, 2001 through February 23, 2001)*

A meeting was held 2/12/01 to discuss final revisions to the Startup Estimate. Based on the outcome of the meeting and subsequent action items, two revised Startup Estimates were submitted to JEA for review on 2/27/01. One estimate is inclusive of all costs discussed. The other estimate includes standby/craft labor up to PSC only. JEA has indicated that they will takeover maintenance responsibilities on a per unit basis following PSC of each unit. The FW Startup Manager will make all future revisions, as necessary, to the estimate once agreed to by FW and JEA. Cost codes have recently been applied to the estimate.

The Document Coordinator will start 3/15/01. The Document Coordinator's primary role will be to begin collecting drawings, data sheets, and other documentation necessary to assemble test packages for the various subsystems. The Documentation Coordinator will also assist with field commissioning activities since he has a significant amount of power plant operating and startup experience A Senior Mechanical Startup Engineer has been hired and is expected to start work on 4/23/01. This gentleman has 30+ years of experience and has been involved with CFB projects. The Lead Boiler Startup Engineer is expected to be on-site by 4/30/01. Resume collection and interviewing is continuing in order to fill the remaining Commissioning Team positions.

The Commissioning Team continues to collect documentation necessary to assemble test packages, specifically electrical, for upcoming system checkout and testing. A meeting has been scheduled with JEA to discuss content of a pilot test package. These are the system test packages, which are to be submitted to JEA, for information and planning purposes, prior to commissioning taking place. Once content and format are mutually agreed on, R&S and WAPC will he asked to generate similar packages.

Fossil Consulting Services (FCS) traveled to the FW Home Office to collect necessary information to begin developing the JEA training program. FCS is currently focusing on developing a pilot training module for FW/JEA review. JEA employee participation has recently (2/16/01) been increased significantly with most of the additions coming from the JEA maintenance group. Based on this increase in participation, training durations, materials, and labor as well as the final cost could also increase significantly. Given the increase in participation, class sizes or other accommodations may need to be made to support the current training schedule. FWUSA has contacted the vendors involved with the training program to reinforce and remind them of their training obligations.

V. COMMISSIONING AND STARTUP *(From FW Progress Report No. 27, February 23, 2001 through March 30, 2001)*

The Startup Estimate has been revised and sent to FW Project Management for review. Based on the changes made, cost codes will be added/deleted as necessary.

Work on the Startup schedule continues as FW is finalizing incorporating Construction ties and JEA continues to work on incorporating ties from their contractors. Progress has been slowed recently due to lost activity ties and data input throughout the Primavera program. Everyone involved is aware of the problems experienced. Possible solutions to prevent additional problems in the future are being considered. As a result of the loss of information, many unnecessary hours have been spent restoring schedules back to the way they were prior to having the problems.

The Document Coordinator started work on 3/15 and has since been assembling subsystem introduction packages. All packages associated with the electrical systems have been submitted to JEA. The remainder of the introduction packages should he submitted to JEA by mid April.

FWSU has given FWCI and SECO the recent commissioning schedule along with a Cable & Conduit Schedule and Instrument Index broke down into subsystems. With this information SECO can prioritize installation by subsystem to support Commissioning. FWSU has also met with R&S and WAPC to discuss Startup coordination and protocol.

The JEA training program will begin on 4/16 with Boiler Fundamentals Training. A meeting was held on 3/27 between FW, JEA and FCS to go over the FW training program and schedule. FW/FCS is currently in the process of finalizing the schedule and training content/format with the vendors. FCS has indicated that the Limestone Handling pilot package will he submitted for FW/JEA review in the very near future. The current schedule shows classroom training to be complete by 7/12/01. JEA has reserved two adequately sized classrooms and offices at the SJRPP facility to support the training program.

The Steam Blow requisition, and applicable drawings, have been completed by the HO and will be sent out for competitive bidding. The pre-boiler and boiler chemical cleaning requisition is still out for comment but is expected to be finalized within the next two weeks after which, it will also be sent out for bid.

JEA has indicated that the FWSU trailer will be on-site 4/14. JEA will take the following week to setup the trailer after which an IT person from the FW Home Office will come on-site the week of 4/23 to set up the computers and network.

V. COMMISSIONING AND STARTUP *(From FW Progress Report No. 28, April 1, 2001 through April 27, 2001)*

FW and JEA discussed the revised Startup Estimate on April 18, 2001. The revised estimate has been increased due to the addition of costs expected to be incurred mainly from FWEC vendor support for Startup and on-site scheduling and project controls support. JEA will provide a written response to the revised estimate.

The JEA training program began on April 16, 2001 with FWEC boiler training. The overall training schedule was finalized with FW vendors, JEA and FCS in April. The only vendor currently not scheduled is the UPS vendor, Cyberex. To maximize the training effort. FW and JEA have jointly agreed to defer certain vendor training sessions until the commissioning representative is on-site. Excluding the deferred training, the overall classroom training program is expected to be complete on July 12, 2001. FCS submitted a SOP pilot package for review, which was found to be acceptable by FW and JEA. As a result, FCS will proceed tailoring the future training packages to what has been reviewed and accepted. The WAPC training manuals have bee reviewed and approved by FW and JEA. WAPC training will begin on May 14, 2001.

Introduction packages for all subsystems within the FW scope were submitted to JEA on April 10, 2001. The lead people for the Startup group have been hired. The Startup group is currently generating test packages prior to actual equipment checkout to increase efficiency during the startup process. These packages consist of component test data sheets filled out partially in advance along with supporting drawings as applicable. These test sheets and drawings will serve as checkout documentation and will ultimately become part of the final subsystem turnover package.

A triple wide trailer dedicated for the Startup group was delivered to the site on April 10, 2001. The trailer should he wired and ready for use by May 4, 2001.

Electro Test Inc. (ETI) is expected to begin electrical checkout of the switchgear, transformers, and other components (excluding R&S and WAPC equipment) on May 7. 2001. Electrical checkout is expected to last for 2-3 weeks.

Steam blow bid packages have been sent out. FW is requesting that proposals and quotations he received from the vendors no later than May 4, 2001. Target acceptance criteria have not been determined as of April 30, 2001. FW is proposing using acceptance criteria explained in a letter written to JEA on March 30, 2001. A final decision must be made before awarding the contract. Pre-boiler and Boiler chemical cleaning bid packages are scheduled to go out to vendors in the week of May 4, 2001.

V. COMMISSIONING AND STARTUP *(From FW Progress Report No. 29, April 28, 2001 through May 25, 2001)*

Boiler #2, including the reheat section was hydro-tested in May.

The Start-up group continues to generate test packages for system commissioning.

Start-up spares are in the process of being ordered and available lists are being forwarded to JEA.

FWCI has a System Turnover Coordinator on site to develop Construction turnover packages and oversee the turnover process to Commissioning.

Steam blow bids have been received and evaluated by FW/JEA. Hydrochem will be awarded the contract with steam blows targeted for September.

FWCI is in the process of running temporary power to the battery chargers to support initial energization, which is currently scheduled for the end of June. Temporary power is also being run to A/C units and other critical equipment to support climate control in the BIEB and the MCC #2 Building.

I&C Test equipment, along with miscellaneous small tools, have been ordered to support instrument calibration and checkout.

The WAPC Commissioning Manager was on-site 6/4/01. A meeting was held to discuss, among other things, system turnover procedures. WAPC submitted a sample T/O package for review. A follow-up meeting will be held the week of 6/8/01.

Start-up attended the ABB FAT in Atlanta on 6/24 and 6/25. Meetings were held to discuss ABB support for FW and WAPC. ABB has dedicated an additional technician to the site and indicated they would be committed to providing support as required including around the clock coverage. ABB has indicated that configuration/logic changes by personnel hired by FW will not be allowed prior to formal turnover from ABB. A final integrated FAT is scheduled to begin on 6/18/01, shortly after which, the software is scheduled to be shipped to the site.

Training:

The JEA training program began on 4/16 and continues. To date FWEC training is complete with WAPC and UCC training nearing completion. FCS has continued to submit SOP's for review with FCS Standard Operating Procedure training beginning on 6/14/01. The classroom training sessions will conclude at the end of July.

V. COMMISSIONING AND STARTUP *(From FW Progress Report No. 30, May 26, 2001 through June 29, 2001)*

Cyberex was on-site to fully commission the Battery Chargers and the Inverters. A load test on the battery bank must be completed yet.

Initial energization of the BIEB (Boiler Island Electrical Building) is scheduled for the week of 7/9/01. This will include all switchgear and MCC's in the BIEB including the MCC's of WAPC.

Three laptop computers have been ordered to support FW and WAPC loop checkout to/from the DCS. Startup is getting pricing from ABB to lease a CIU to be mounted in the BIEB so that a computer can be set up as a work station, from a central location, to access all of the I/O racks on the network. If a CIU is not used, the laptop will have to be plugged into the individual processors and will access that processor only.

The Start-up group continues to calibrate instrumentation associated with Common & Boiler #2.

Construction and Startup will submit example subsystem turnover packages to R&S and WAPC to be used as a guideline documentation for their respective turnover package submittals to FW.

Hydrochem is continuing to work on the engineering package for Boiler #2 steam blows.

The pre-operational chemical clean bid packages have been sent out to three contractors. Proposals are to be submitted back to FW no later than 7/13.

JEA Training

The JEA training program began on 4/16 and continues. To date, FWEC, WAPC, UCC, & Pennsylvania Crusher training is complete. In addition, FCS System Operating Procedure (SOP) training will be complete on 7/6/01. Other select vendor training sessions will be done when the vendor is on-site commissioning equipment. Operation qualification training will begin once systems are commissioned.

V. COMMISSIONING AND STARTUP *(From FW Progress Report No. 31, June 30, 2001 through July 31, 2001)*

The battery load bank test was completed in July. This completes commissioning of the Battery Chargers, Inverters, and Battery Banks.

The BIEB (Boiler Island Electrical Building) was energized on 7/14. Subsequent energization of the remaining BIEB switchgear, transformers and MCC's took place in following weeks. The MCC's in the MCC 2 Building and WAPC's Common and #2 MCC's were energized on 7/24. Equipment on temporary power in the BIEB is being transferred to permanent power.

Calibration of Common, Boiler #2 and Boiler #1 instrumentation continues.

Startup has received the steam blow engineering package from Hydrochem. The information has been passed on to Shaw for stress analysis and piping support recommendations. Temporary piping is scheduled to be installed beginning mid to late September.

Hydrochem has also been awarded the contract for preoperational cleaning of the pre boiler and boiler circuits. The chemical clean for Unit #2 is currently scheduled for the end of August.

WAPC continues with commissioning activity focusing on testing piping to support compressor startup.

R&S is scheduled to energize their switchgear and MCC's by mid August to support "C" train commissioning.

FW is currently developing a test protocol for necessary Unit #2 PSC testing. The test protocol is schedule to be complete by mid August.

A FWESI Service Engineer will be on-site 8/13 to assist with preparation for boiler fan run-ins and combustion air damper mechanical setup/calibration.

V. COMMISSIONING AND STARTUP *(From FW Progress Report No. 32, August 1, 2001 through August 24, 2001)*

A Diamond Power Service Representative was on-site the week of 8/20/01 to conduct a mechanical walkdown of the U2 sootblowers.

An ABB Garden City Service Representative arrived on-site 8/27/01 to begin boiler fan inspections in preparation for fan balancing. By the end of August, the 2A & B ID fan motors, 2 A & B SA fan motors, and the 2 B PA fan motor were run-in. The 2 A PA fan motor is expected to be run-in 9/7/01. The above fans are scheduled to be run-in and balanced beginning the week of9/10/0l.

A Service Engineer representing Peabody will be on-site the week of 9/10/01 to mechanical inspect the booster fans in preparation for fan run-in and balancing.

Start-up began inspecting U2 ductwork, breeching, plenums, and the furnace for cleanliness in preparation for airflow testing and balancing.

Instrument and service air headers were charged on 8/25/01. SECO is currently working on installing instrument air to each individual user in the U2 structure. Instrument air is currently being supplied from the existing JEA compressors, as the new compressors are not currently operational.

The CCW system has been flushed and can be put into service once the CCW pumps are available. A workaround will be put in place to get cooling water to the large fan bearings during run-in and balancing.

The DCS I/O racks in the BIEB were powered up and tested by ABB on 8/29/01. Electrical I/O loop check has begun. ZCC has indicated that the fiber optic and ethernet communication loop will be installed by 9/13/01.

Start-up, with the support of Construction, has spent the last two weeks of August installing temporary pipe and hose in preparation for the U2 chemical cleaning.

The Limestone Crushing Facility was energized on 8/18/01. Control circuit checkout and motor run-ins are continuing into September. Limestone is scheduled to be delivered on 9/14/01. R&S is scheduled to begin a crushing test, using the “C” train, the week of 9/24/01.

WAPC continued commissioning activities through August, including run-in of the 3 compressor motors. The compressors have not been run due to installation issues with the glycol cooling system.

Calibration of Common, Boiler #2 and Boiler #1 instrumentation continues.

Start-up is currently staffing up with Electrical and I/C Test Technicians to support ongoing calibrations and DCS loop verifications.

V. COMMISSIONING AND STARTUP *(From FW Progress Report No. 33, September 1, 2001 through September 28, 2001)*

The Unit 2 primary air, secondary air and induced draft fans are now balanced and ready for operation. The three Booster fans were also run and balanced. The "C" booster fan motor is currently in the shop for bearing replacement.

A Gardner/Denver service representative was on-site 10/1/01 to begin pre-commissioning inspections and checkout for the Intrex, Seal Pot, and Limestone blowers.

The chemical clean for Unit 2 boiler and pre-boiler circuits was complete on 9/10/01. Drum internal installation was completed on 9/24/01. The boiler and superheater circuits are currently in wet layup with a nitrogen cap.

An air pressure test for Unit 2 was completed on 9/26/01 using the 2A primary air fan. Minor leaks were found. A subsequent test will be conducted once the leaks are repaired.

The Dresser safety valve representative was on site in September to remove hydro plugs and install the permanent discs for the Drum, Super Heat. Hot Reheat and Cold Reheat safeties.

Boiler instrumentation, damper, and valve calibrations continue.

Control loop checkout began on 9/5/01 using laptops. As of the end of September, the fiber optic loop and Ethernet to the BIEB were not functional. Work is ongoing to establish reliable communication via the fiber optic and ethernet loops. FW has asked for a minimum of three Operator Stations to be placed in service in the BIEB control room to support WAPC and FW checkout. In addition, the CIU will be upgraded to support multiple laptops, which is to include an Engineering Work Station. The idea is for WAPC and FW to be able to work from one central location during checkout which will allow ABB to support both contractors. This will also allow WAPC and FW to be close to their respective I/O racks for troubleshooting.

Installation of temporary steam blow piping began in September. Estimated finish date is 10/19/01.

Instrument & Service Air are in service and closed cooling water and cooling condensate are available for service.

The Unit 2 boiler and AQCS fabric filter sump pumps were commissioned in September.

The natural gas piping to the limestone crushing facility and to boiler #2 have been air blown and are available for service.

Cyberex is scheduled to be on-site 10/9/01 to conduct UPS training.

The "C" limestone crushing train is currently being commissioned. The system has gone through several dry-runs with vendors on-site to address specific issues. One significant issue currently being addressed, by all vendors involved, is the "C" mill dust collection fan. The fan's base and supports are undergoing modification to reduce vibration to an acceptable level. Once the fan is acceptable to run, the system can be charged with limestone and testing can begin.

WAPC commissioning activity was on going in September. Elliott will be on-site in October to oversee the replacement of the air compressor bearings after which the compressors will be commissioned. 90% of Unit 2 equipment has been commissioned.

V. COMMISSIONING AND STARTUP *(From FW Progress Report No. 34, October 1, 2001 through October 26, 2001)*

The U2 DCS became usable for shooting loops in mid-October. As of the first week in November, approximately 1000 loops for U2 and common have been verified. Instrument calibrations and valve/damper setup continued through October.

Installation of temporary steam blow piping is expected to finish the week of November 5th.

Instrument and Service Air, Closed Cooling Water and Cooling Condensate systems are in service. The natural gas line to the limestone crushing facility was put in service to support "C" train operation. The natural gas lines to the U2 boiler have been air blown and are ready to be charged with natural gas prior to firing. The fire protection system was completed and is available for service. The lime slurry sump pumps were commissioned in October and functionally tested, the level transmitter is currently out for repair. U2 boiler and fabric filter sump pumps remain in service.

Detailed boiler air/gas side inspections were completed in October to support fan operation.

Boiler fan logic testing began in October. The ID, SA, & PA fan motor breakers were put into the test position to confirm permissives and interlocks. Running the fans together from the DCS to complete functional testing and checking process instrumentation will take place the week of 11/5. Once air flow testing and purge interlock testing along with cold BMS interlock testing is complete. The elbow burners can be fired and hot interlock testing will take place.

The Stock gravimetric feeders have been dry run and are calibrated.

The limestone feed system has been partially commissioned to support "C" train limestone testing which is expected to take place once the "C" train can attain 50 T/H.

Boiler water/steam side MOV commissioning is on going.

The Bently-Nevada rep has been on-site to install and commission boiler fan monitors.

Peabody has been on site to inspect the elbow burners.

Limestone, Intrex, and Seal Pot blower motors have been run-in with the exception of the 2B Intrex motor which has a faulty slinger ring. "B" & "C" BA blower motors were run-in, "A" needs a motor TC wire replaced. The 4 limestone blowers have been run-in.

All MCC's associated with U2 have been energized.

Commissioning of the U2 FA/BA conveying systems has begun. UCC is on-site and has begun checkout of field devices from the PLC. Allan-Bradley is scheduled to be on-site to program the gathering conveyor VFD's so that they can be run-in as early as possible.

Commissioning of the "C" limestone crushing train continued in October, completing loop testing and functional checkout. The system was put into service on 11/3/01. Plans will be to continue operating the system increasing the feed rate up to 50 T/H. Once the system proves to operate reliably, testing can begin to achieve optimal sizing. The mill dust collection fan vibration remains outside the acceptable range, but can be operated providing fan bearing temperatures remain under 200 degrees. R&S continues to try and resolve the issue with their vendors and the assistance of JEA. R&S also continues to complete punchlist items. "A" and "B" train commissioning activity has continued.

Two of the three AQCS air compressors have been commissioned and both ball mills have been commissioned. Functional checkout of systems and loop verification through the DCS began in October and will be complete by the end of November. Motor run-ins on Unit 1 have begun. A DCS snapshot of the Unit 2 AQCS software is scheduled for 11/9/01 to support getting the Unit 1 software back to the site by 11/20/01. Gravimetric feeder calibrations are scheduled for the week of 11/5.

Cyberex conducted UPS training in October.

V. COMMISSIONING AND STARTUP *(From FW Progress Report No. 35, October 26, 2001 through November 23, 2001)*

Unit 2 Air Flow testing was completed on November 24, 2001. Boiler purge logic and Boiler Management System checkout followed.

First Unit 2 gas fire was established on December 1st utilizing the "B" elbow burner. Final checkout and logic modifications remain with refractory dryout are scheduled to begin December 7, 2001. Steam blows will begin on December 9th or 10th.

Unit 2 Limestone, Intrex and Seal Pot blowers were run-in in November. The Seal Pot system is fully functional with some work remaining with the Limestone Feed and Intrex Blower systems.

Unit 2 Water/Steam side MOV's were setup in November.

Unit 2 Steam blow piping installation has been completed. Final engineering walkdowns have been completed and open items resolved. Hydrochem was brought in on December 5th to walkdown the temporary piping and get involved in final preparations for steam blowing.

Unit 2 and Unit 1 boiler sump pump breaker components were changed out in November allowing the pumps to work in automatic. Unit 2 and Unit 1 fabric filter sumps are also fully functional.

The 2A Secondary Air fan bearings were inspected and will be replaced with new. The 2A Induced Draft in board bearing will also be replaced. An ABB representative arrived on-site November 28th.

Unit 2 phosphate pumps have been commissioned and are available for service.

Unit 2 sample panel is available for taking grab samples. Johnson March has been contacted to provide on-site commissioning support for the analyzers.

Unit 1 and Unit2 HP/LP bypass valve skids were checked out and are ready to be flushed.

Unit 2 gravimetric fuel feeder commissioning was completed.

DCS work packages continue to be generated to allow for necessary configuration/graphics changes to be made by ABB.

The lime prep sump pumps were automated following the replacement of level transmitter parts and mechanical rework by Construction of both pumps and the agitator. Lime slurry from these pumps and the boiler sump pumps is now routed to the basin supplied by JEA.

Commissioning work of the Unit 2 and Unit 1 UCC Fly ash and bed ash system continues. Fly ash and bed ash blowers have been run-in, as have the Dry Fight Conveyors and other miscellaneous motors. Vibration issues, from what is believed to be coming from the blower base, are in the process of being resolved.

A snapshot of the Unit 2 AQCS graphics and configuration was taken on November 9th and sent to Atlanta. The software was returned to the site on November 20th but is not expected to be functional until December 12th due to remaining loop 3 work and ABB setup time. The snapshot for Unit 2 boiler software was taken on November 21st. The software is expected to be on site by December 12th.

WAPC slaked lime on November 15th with minimal problems. As it stands, Unit 2 AQCS commissioning is complete with final adjustments to be made once solid fuel is fired.

R&S achieved 50 TPH using the "C" train on November 16th, the system was shutdown due to an incorrectly engineered pressure/vacuum relief hatch. Since then, JEA had disallowed operation of the "C" train until December 5th following punchlist cleanup and equipment rework to comply with their vibration spec.

22 turnover packages have been received by Commissioning with 13 accepted. 8 turnover packages have been submitted to JEA with 0 accepted.

V. COMMISSIONING AND STARTUP *(From FW Progress Report No. 36, November 24, 2001 through December 28, 2001)*

The Unit 2 refractory cure was completed on December 9, 2001 after temperatures in the primary air duct reached 1300 - 1400 degrees.

Unit 2 steam blows began on December 10, 2001. On December 19th the Main Steam targets were accepted by JEA after 160 blows.

The Phase II MS bypass/CR service blow was completed on December 19th and the Phase III CR piping service blow was completed on December 20th.

Phase IV exhaustive steam blows began on December 21, 2001. Exhaustive blows for the most part were pressure limited and in some cases continuous blows were performed during the night to comply with maximum allowable noise levels as established by JEA at their property boundary. In some cases, nighttime operation included thermal cycling of the boiler and piping. On January 3, 2002, the natural gas supply to Unit 2 was curtailed due to low ambient temperatures and as a result the boiler was shutdown. After 379 total steam blows, JEA has elected not to accept the final targets due to a light iron oxide buildup left on the target. As a result, the decision was made to perform a chemical clean on the reheater and reheat piping. Steam blows will resume following the chemical clean. The Phase V service blow was completed prior to the gas curtailment.

The Unit 2 chemical feed system was put in service to support steam blows.

All Unit 2 sootblower motors were replaced in December and commissioning is complete except for final sequential operation.

The Unit 2 Intrex blowers and system went through final functional checkout in December.

The Unit 2 Seal Pot blowers and system went through final functional checkout in December.

The Unit 2 Limestone Feed system went through final checkout in December.

The inside of the ammonia tank was hydroblasted on December 28th to remove rust buildup. The manufacturer's representative is being scheduled, the tank will be filled with water and the pumps commissioned.

The Unit 2 Stripper Cooler rotary valves were programmed and run in December.

The Unit 2 sample panel was fully commissioned with the assistance of JEA's chemistry lab personnel and a Johnson March representative.

The Unit 2 CEMS system was partially commissioned in December. Final checkout by KVB will take place the second week of January.

Unit 2 fly ash and bed ash system commissioning was on-going in December. The systems have been operated from the Ash Handling workstation but both systems are waiting for final checkout once communication is established between the workstation and the DCS. Another outstanding issue is the fly ash exhausters not being functional due to the exhausters not meeting vibration specifications.

CCI was on-site in December to oil flush the Unit 2 HP/LP hydraulic skid. The HP bypass valve, LP bypass valve, and hydraulic skid cannot be fully commissioned until the valve are reinstalled during steam blow piping restoration.

Unit 1 Air/Gas side inspections continued through December.

Unit 1 Primary Air Fan Lube Oil flushing activity continues.

Unit 1 ID, PA and SA fan motors have been run-in. ABB Garden City will be on-site in January to balance these fans. They will also investigate the Unit 2 fan vibration issue and will re-verify the coupling gap for the 2A PA fan.

Unit 2 WAPC system commissioning was completed in December other than putting the SDA sprays in service once flue gas temperatures can support it. Unit 1 checkout is schedule to begin in early January. WAPC is prepared to pre-coat the Unit 2 bags when the fans are restarted after the restoration outage and before sand is added to the furnace.

Operational testing of the “C” limestone prep. Train was on-going through December. The system has been operated at different mill speeds to try to get to the optimum grind. The “B” train has been tested and is functional with the exception of the mill dust collection fan having excessive vibration, which R&S continues to try to resolve. “A” train checkout is continuing. If the mill dust collection fan issue for the “B” train does not get resolved in a timely manner, the “A” train will be the next to start testing. Two trains are expected to be operational prior to first solid fuel fire.

V. COMMISSIONING AND STARTUP *(From FW Progress Report No. 37, December 29, 2001 through January 28, 2002)*

Unit 2

Unit 2 reheater chemical clean was completed January 12th, 2002.

Unit 2 was fired on January 13th following final repairs and header inspections. On January 14th the boiler was fired to 35 psi for a period of eight hours to re-passivate the boiler. On January 15th boiler pressure was increase to begin reheater steam blows. Reheater steam blows were completed at 22:30 on January 15th. Steam blow piping restoration started immediately after the completion of steam blows.

CCI was on-site January 16th to begin assembly of the Unit 2 HP/LP valves. Preliminary HP/LP valve tuning was completed on January 27th.

PA grid dP testing and PA FW testing took place on January 17th.

Boiler Intrex sand was loaded on January 21st.

Reheat and boiler safeties were set on January 25th.

Commissioning of the Unit 2 Ammonia system was completed in January.

Fuel Feeder functional check out took place in January.

Diamond Power was on-site in January to finish commissioning of the Unit 2 sootblower system.

Stripper Cooler Testing was completed in January.

Final alignment of the Intrex, Seal Pot, and Limestone blowers were completed in January.

The stack CEMS and SDA inlet analyzers were commissioned in January.

Checkout the Unit 2 ash systems is complete and Unit 1 checkout is nearing completion. All drive and driven sheaves for the FA exhausters were dynamically balanced.

On January 27th the boiler was shutdown after a hot spot and gas leak was identified at the "C" PA combustion duct wallbox at the plenum connection point. Repairs to all 3 PA combustion duct expansion joints continued through the end of January. Several PA/SA fabric expansion joints were replaced with wider belts during the outage.

WAPC checkout and functional testing is complete. Once solid fuel is fired final temperature and SO_2 control loops will be tuned. A final walkdown of common and Unit 2 will take place by mid-February. The WAPC baghouse was precoated on January 24th. The first batch of lime slurry was batched in January.

Unit 1

Boiler Air/Gas side inspections continued through January.

Seal Pot, Intrex and Limestone blower motor run-ins occurred in January.

Mechanical inspection of the sootblowers was completed in January.

Preparations to clean the Preboiler, Boiler, SH and Reheater got underway in January.

The Closed Cooling Water system was flushed and put in service using the JEA Unit #2 system.

The PA lube oil system flushes began in January. Vapor phase cleaning by Hydrochem was ultimately used to accelerate the cleaning activity.

18 of 22 water/steam side MOV's were commissioned in January.

All ABB Garden City fans have been balanced.

Ash system checkout continued in January.

R&S

Testing of all three trains is on-going. R&S vendors were onsite in January to address remaining issues associated with system operation. Gradation testing continues. Diverter boxes have been fabricated and installed in the "C" train to optimize sampling methods. An outside consultant was on site in January to review sampling and testing methods and will return on February 13th to oversee the sampling process while the "C" train is in operation. Testing will be done in the lab to determine attrition rates between the surge bin in the limestone prep. Building and the Unit 2 day bin. Three trains will be available by the time Unit 2 full load operation is achieved.

V. COMMISSIONING AND STARTUP *(From FW Progress Report No. 38, January 29, 2002 through February 25, 2002)*

UNIT 2

Coal was first fired in boiler 2 on February 11th at 11:50.

JEA synchronized the generator for the first time at 21:55 on February 19th. JEA worked to resolve vibration issues between February 19th and March 1st.

Boiler 2 has been operated successfully to 50-60% load maximum due to feedwater and cold reheat piping growth issues. The boiler has operated solely on coal for approximately 4 days through the end of February.

Bypass steam flow to the condenser has been minimized to reduce the potential for additional condenser tube failures until proper tube shielding can be put in place.

KVB was on-site throughout February to continue commissioning of the U2 and U1 CEMS. CEMS training is scheduled for the week of March 11th.

Diamond Power was on-site in February to complete commissioning work on the boiler 2 sootblowers.

The Unit 2 ash handling has been operating well and has run as needed to support boiler 2 operation. GD has sent a vibration expert to the site to resolve exhauster and blower vibration issues. Unit 1 commissioning is nearly complete.

UNIT 1

Boiler 1 fan logic testing was completed in February.

Boiler 1 air pressure testing was completed.

Chemical cleaning of the U1 pre-boiler, boiler, SH, and reheater was completed in February. The boiler was refilled with a nitrogen cap. A significant percentage of the total waste was hazardous and will be treated and/or hauled off site.

ID, PA, & SA fans were run-in and balanced.

Limestone, Seal Pot, and Intrex blowers were run-in.

PA booster blowers were commissioned in February.

Boiler 1 loop tasting and calibrations continued through February.

Bentley Nevada was on-site to assist with vibration probe commissioning.

Steam blow piping installation was started in February.

WAPC

WAPC continued to operate their system to support boiler 2 operation.

WAPC completed unit 1 loop verification and functional checkout. WAPC is ready and available to support boiler 1 operation.

WAPC common and unit 2 systems were jointly walked down with JEA. The final outstanding items lists are being compiled.

Reuse water pressure was reduced to the lime prep. sump pump discharge piping was reduced in an effort to keep the piping from separating due to water hammer. Since the pressure was reduced no failures have been experienced.

R&S

The A, B, & C limestone crushing trains are functional. Diverter boxes were installed in the C train to divert each of the three surge hopper streams for gradation testing.

V. COMMISSIONING AND STARTUP *(From FW Progress Report No. 39, February 26, 2002 through March 29, 2002)*

UNIT 2

On March 4th the boiler tripped due to low instrument pressure. During and after the trip, backsifting occurred in the Intrex, Seal Pot, and Primary Air to return channel plenums and piping.

Between March 4th and March 7th, attempts were made to clear piping of backsifted material and return the boiler to normal operation.

On March 8th the boiler was force cooled after the C" cyclone flushed causing a furnace upset.

Outage work was completed on March 27th and on March 28th, intrex refractory dryout began.

On the morning of March 31st, the refractory dryout and sand charging was complete and the unit was depressurized to allow JEA to complete lube oil piping restoration.

UNIT 1

Boiler cold air testing was completed on March 3rd. The boiler was turned over to Construction to rework the combustion duct expansion joints.

A, B, & C Booster Blower run-ins were completed in March.

The duct burners were put into operation on March 18th.

Steam blows began on March 22nd and ended on April 7th after 269 total steam blows.

Loop verification and checkout along with calibrations continued through March.

Johnson March was on-site in March to commission the Sample Panel.

The U1 chemical feed system was functional on March 15th.

U1 Ash Handling commissioning and functional checkout continued in March. As of the end of March the only outstanding issue is the on going effort to reduce BA blower/motor vibration.

WAPC

WAPC continued to operate their system to support boiler 2 operations.

U1 loop checks and functional testing were completed in March.

R&S

The A, B and C limestone crushing systems are functional. Lower than design transport capacities to the U1 silo are being addressed by R&S and Delta Ducon.

Training

KVB completed on-site training for JEA personnel on March 15th.

V. COMMISSIONING AND STARTUP *(From FW Progress Report No. 40, March 30, 2002 through April 29, 2002)*

UNIT 2

All Unit 2 equipment is commissioned. Operational testing of systems was also completed.

Pet coke was first fed to boiler #2 at 11:00 on April 14th and was increased to a 50/50 blend.

On April 16th, the boiler tripped and the "B" expansion joint failed forcing the unit to be cooled down for inspection which led to an extended shutdown for S/C expansion joint rework, surface removal, and intrex refractory repairs. The boiler outlet block valve was scheduled to be repaired and installed during the outage. When the old stem was removed from the bonnet it was found that the bonnet was damaged beyond repair. As a result, the bonnet with stem was reinstalled without the valve internals. The components are ordered and should arrive on June 7th.

The generator was again synchronized on April 30th.

FWEC Engineering arrived on site during the month to address issues with boiler operation and to oversee boiler testing activities following surface removal and intrex modifications. Several tests have been conducted with positive results including changing intrex/bypass chamber air flows to control solids bypass. Tests have also been conducted to increase limestone feed rates to match the rates expected when on coke to simulate coke firing while on coal.

Several delays impacted Unit 2 operation during the month of April including boiler expansion joint rework, surface removal, intrex work and several JEA BOP issues. On April 29th, at 16:20 a black plant occurred due to electrical grid instability. Both boilers were restarted after conditions stabilized.

UNIT 1

Steam blows were completed on April 7th.

The restoration outage began on April 8th and was extended to remove surface, rework stripper cooler expansion joints, and modify the intrexes. The outage was completed on April 24th.

A clean air DP/flow test was completed on April 26th.

CCI was on-site during and after the outage to assemble and setup the HP/LP bypass valves. Following setup, functional checkout and operational testing took place.

During the month of April, all Unit 1 mechanical commissioning was completed. Operational testing of the limestone feed, SNCR, and stripper coolers remain. Functional logic testing is complete with the exception of fuel feed hot interlock testing which will take place once bed temperatures are increased to the solid fuel permissive.

Reheater safeties were set on April 27th and drum and SH safeties were set on April 28th.

The boiler was depressurized to allow the boiler outlet block valve to be opened and main steam pressurized in preparation to bypass steam to the condenser. On April 29th, at 16:20, a black plant condition suspended Unit 1 operation.

Several delays impacted Unit 1 operation during the month of April including boiler expansion joint rework, surface removal, intrex work and several JEA BOP issues including Circulating Water/CCW outage, landfill gas up to burners, black plant, and miscellaneous turbine issues.

The Unit 1 CEMS analyzers were commissioned and are ready for service.

WAPC

WAPC continued to operate their system to support Unit 1 and Unit 2 operation. The Unit 2 SDA hopper has plugged several times with wet ash due to improper slurry atomization. These issues are being worked out as more operating experience is being gained.

Unit 1 fabric filter was percolated on April 25th.

WAPC Unit 1 systems were jointly walked down with JEA on April 24th.

R&S

A, B, and C trains are functional. The system remains unable to transport 50 T/H to the Unit 1 storage silo. Several operational changes have been made over the last several weeks to increase capacity. Engineering is continuing to provide a solution.

Fuel Crushers

In an effort to increase product sizing of coal and coke, the “B” crusher had four of the six rows removed with every other hammer of those two rows removed also. All coal and coke being burned will be run through the “B” crusher as further testing takes place.

V. COMMISSIONING AND STARTUP *(From FW Progress Report No. 41, April 30, 2002 through May 27, 2002)*

UNIT 2

Boiler load reached 100% MCR on May 5th.

Boiler Process Verification stack testing was conducted on May 7th and May 8th for trace metals. On May 8th the turbine and boiler tripped. Based on start-up progress through May 9th, it was decided that there would not be sufficient time to complete trace metals testing. Based on PSC coal inventories at the time, the decision was made to cancel the remaining testing which included S03, PM, PM-10, and VOC. All other trace metals testing were complete.

Pet coke was fired on May 10th. On May 12th the boiler was operated on 100% pet coke for the first time.

The SNCR system was put into service on May 6th.

On May 20th, PSC testing on pet coke was completed. Stack testing was completed except for the last run for H_2SO_4 which was interrupted due to a furnace bed inventory upset. Formal test results have not been issued to date.

Following the excursion, it was noted that an agglomeration had formed in the "C" cyclone conical section causing flow restriction and improper intrex operation. Load was reduced to 55% to stabilize the boiler.

On May 22nd, the transition to firing 100% coal began in an effort to erode away the cyclone agglomeration and at a minimum reduce the potential for further buildup. On May 25th, sand was added to the "C" cyclone as a further effort to try and erode away the agglomeration.

On May 25th an electrical grid disturbance tripped the ash handling systems and select fuel feeders. Boiler operation was recovered and boiler load was brought back to 55%. Since that time, several electrical disturbances causing voltage dips have been experienced causing select feeders for each boiler to trip. The cause of the disturbances is under investigation.

The boiler operated at 55% load up through May 31 at JEA's request to support system electrical load, at which time it was taken out of service to remove the buildup in the cyclone. The B, C, D, & E fuel silos were emptied for inspection prior to the shutdown. JEA also performed several turbine tests prior to shutdown. A high-high DA level tripped the turbine during the shutdown and the boiler continued to be force cooled in preparation for outage work to begin on June 3rd.

CEMS linearity testing and response time testing was completed which completes CEMS certification. DAS software changes will be completed to incorporate total SO_2 removal across the unit, boiler SO_2 removal, and CO in lbs/hr indicated to the DCS. The Monitoring Plan was also loaded into the system.

UNIT 1

Following startup of the boiler, the turbine was rolled to 1000 rpms on May 2nd at which time it was tripped due to a high bearing temperature which led to bearing failure. Foster Wheeler took the opportunity to address several operational and maintenance issues while down.

On May 9th, the turbine bypass system was put into service and the turbine was rolled to 1000 rpms. On May 10th, the boiler was test fired on coke and the turbine was rolled to 1700 rpms. At which time it was tripped when a high bearing temperature was again experienced. It was determined that another bearing had failed. Foster Wheeler again performed outage work that fell within the turbine outage window.

Boiler fans were started on May 23rd, and the burners were test tired. On May 24th, boiler pressure was maintained at 400 psi waiting for the main steam piping to be released. On May 27th, the boiler outlet block valve was opened and the steam piping to the turbine was warmed up.

Between May 27th and May 29th, the boiler was fired to support T/G testing and on May 29th at 11:00, the generator was synchronized.

Between May 30th and May 31st, the boiler was kept at a minimum load to allow for the transition to better bed quality. Turbine overspeed testing was successfully completed after which a PLU test was attempted.

WAPC

The Unit 2 recycle ash systems have been put into service for short periods of time. Frequent plugging of the nozzle and final filter led to replacing the original grit screen with an 8 mesh to remove a larger fraction of grit.

The Unit 1 fabric filter has been put into service but the scrubber has not. Once the boiler operates at a constant load for a period of time, the lime slurry system will be put into service and the temperature control loop will be tuned after which the ash recycle system will be put into service.

R&S

A, B, and C trains are functional. The system remains unable to transport 50 T/H to the Unit 1 storage silo. Operational changes to increase capacity have been unsuccessful to date. Several tests using different configurations with the “C” train were performed to test gradation. Results from J&J have not been received. R&S and Delta Ducon continue to review the problem with capacity.

Fuel Crushers

In an effort to increase product sizing of coal and coke, the “B” crusher had 4 of the 6 rows removed with every other hammer of those two rows removed also. Plans are to remove hammers from the “A” crusher as well.

APPENDIX 2

JEA START-UP UPDATE REPORTS

The responsibilities of the JEA Start-Up group included integrated start-up and operation of the units until turnover to JEA Operations. First fire on gas in Unit 2 occurred on December 1, 2001, and from that time on, Update Reports were published periodically to document the status of start-up of Unit 2 (and Unit 1). These Update Reports, through August 2002, are included in this appendix for information and reference purposes.

NSRP Startup

Update Report

Progress Through December 2001

January 4, 2002

Summary

Unit 2 and Common Systems startup progress through the end of December, 2001, stands at 59% complete, which equates to 44% completion for overall project startup progress. Maintenance Readiness as of this date is 64% complete and Training is 93% complete. Detailed reports for each area follow.

Current Schedule Milestones (Unit 2 Critical Path Schedule attached)

	Unit 2	Unit 1
First Gas Fire	* Dec 1, 2001	
Start Steam Blows	* Dec 10, 2001	Contract date
Turbine Roll	Jan 17, 2002	For PSC
Initial Synchronization	Jan 23, 2002	shown
Solid Fuel Unsupported Fire	Jan 24, 2002	
Preliminary Substantial Completion	Mar 14, 2002	May 15, 2002
Substantial Completion	June 12, 2002	

* Actual Dates

Material Handling

All major fuel handling systems within material handling are complete to the level being fully operational. Five loads of fuel have been received and unloaded to date, composed of three pet coke shipments and two coal shipments. The next pet coke shipment is due Monday, 1/7/2002, which once unloaded will fill both domes to capacity.

A number of minor systems are in the final stages of startup and will be complete within project schedule time frames. Ash Processing is in the early stages of check out, and due to size and complexity will be an area of greatest focus over the coming month or more.

Limestone Preparation continues to present a major challenge. To date the 'C' Train has processed limestone at a rate of 47 to 48 TPH, with sizing and moisture results that are currently under evaluation.

Boiler Island

All major Unit 1 and Common Boiler Island systems are in the startup phase with most being to the point of partially to fully operational. The fuel feed system is undergoing check out at present. The AQCS systems have been operational for some time, and the first batch of slurry has been slaked. Remaining AQCS checkout will be completed once solid fuel is admitted to the boiler.

Unit 2 Steam blows are nearing completion as of this date, with hot and cold reheat being the only remaining section to be accepted. Inordinate amounts of rust have been encountered in blowing this section, which otherwise meets acceptance criteria. Steps are underway to locate the source of rust through chemical analysis and inspection.

Unit 1 is at the earliest stages of startup, with run-ins to date on major boiler fan motors and AQCS checkout through the DCS system.

Balance of Plant and Turbine Generator

All balance of plant systems are to the point of being fully operational with the exception of the 'B' Boiler feed Pump and the turbine auxiliary systems which are associated with the turbine lube oil flush and initial turbine roll.

The turbine lube oil flush has been a major challenge to date due to long term deposits in the piping. Once conventional methods proved ineffective, the flush was suspended and the piping high pressure water lanced and then chemical cleaned. Results of these steps were promising and the system is now in the final stage of oil flushing again. This is scheduled to be complete and the system restored to normal, leading to a generator air test and turning gear operation within one week.

Another major challenge has been overcome on the turbine control Mark VI system, where electrical noise was causing excessive turbine valve movement at steady state conditions. This was resolved through discovering and correcting wiring inconsistencies between the turbine valves and junction boxes on cables provided by a third party vendor.

Unit 1 Startup is now underway with the energization of medium voltage switchgear, DCS system and checkout of refurbished turbine auxiliary equipment.

Challenges

Transition from startup to plant operations and maintenance groups.

Coordination and on-schedule completion of Unit 1 Balance of Plant, involving engineering, contract construction, plant maintenance and startup groups.

NSRP Startup

Update Report

Progress Through January 2002

January 31, 2002

Summary

Unit 2 and Common Systems startup progress through the end of January 2002, stands at 65% complete with Unit 1 at 12% complete. This equates to 51% completion for overall project startup progress. Maintenance Readiness as of this date is 67% complete and Training is 93% complete. Detailed reports for each area follow.

Current Schedule Milestones

The following dates do not reflect the impact of the boiler repair work now underway, and are therefore expected to extend 7 to 9 days once the schedule is updated. The schedule will be re-distributed electronically within the next 48 hours.

	Unit 2	Unit 1
First Gas Fire	* Dec 1, 2001	
Start Steam Blows	* Dec 10, 2001	Contract date
Turbine Roll	Jan 29, 2002	For PSC
Initial Synchronization	Feb 4, 2002	shown
Solid Fuel Unsupported Fire	Feb 5, 2002	
Preliminary Substantial Completion	Mar 26, 2002	May 15, 2002
Substantial Completion	Jun 24, 2002	

* Actual Dates

Material Handling

All major fuel handling systems within material handling are complete to the level of being fully operational. Dust collection system checkout is nearing completion, while checkout of the as-received and as-fired sampling systems, as well as the ash processing system are well underway. Startup of the 'C' Limestone Preparation train has progressed to the point of having processed 50 TPH for limited time periods, with initial sizing results being acceptable to Foster Wheeler. Further work on individual components remains the focus in order to attain full rated operating output on a continuous basis. The 'B' and 'C' trains have been functionally tested and punch-listed, but have yet to process limestone except for very brief runs. The Material Handling System is ready to support solid fuel firing at this time, and it is anticipated that solid fuel will be loaded to the silos during the week of February 4, 2002.

Boiler Island

All major systems on the Unit 2 Boiler are now operational. Steam blows of the main and reheat systems were completed on January 15, 2002, during which time an unplanned chemical cleaning of reheater and reheat piping was performed, due to the inordinate amount of rust that was encountered. Following steam blow restoration, initial bed inventories consisting of sand were loaded into the intrex and furnace, followed by tuning of the hot loop and HP and LP Bypass systems. Though operational, extensive tuning of individual control systems and the boiler as a whole remains the focus.

At the time of this report, repairs are underway to the metallic expansion joints on the primary air to grid inlet plenum connection. This includes enhancing the design with increased structural support members. Other repairs being made during the same time include replacement of a number of fabric expansion joints on the furnace.

These repairs are expected to be complete by February 5, 2002, at which time gas firing is scheduled to re-commence, to be followed shortly by solid fuel firing.

The initial delivery of aqueous ammonia was received on Tuesday, January 29, 2002.

Progress to date on the Unit 1 boiler startup includes balance runs of the major boiler fans, which is scheduled to complete by February 3, 2002. Chemical cleaning of the pre-boiler and boiler water systems will commence this Friday, February 1, 2002, and based on the Unit 2 experience, the main and reheat steam systems will also be chemically cleaned. This work is expected to require 2 weeks to complete.

The Unit 2 AQCS systems are ready to support solid fuel firing. Slurry has been slaked and the initial seeding of the baghouse bags has been completed. Unit 1 AQCS startup is underway in all areas. The fly and bed ash transport systems are also at a similar level of operational readiness.

Balance of Plant and Turbine Generator

All balance of plant systems are to the point of being fully operational with the exception of the ‘B’ Boiler Feed Pump and the turbine auxiliary systems which are dependent on initial turbine lube roll. During the past month the main turbine lube oil flush was completed as well as initial operation on turning gear. On January 24, 2002, condenser vacuum was established and held for a period of days with very acceptable results. Machining work is currently underway on the turbine lube oil cooler transfer valve, which suffered some wash damage during chemical cleaning of this system. Completion of this work is schedule to coincide with completion of boiler repairs

During generator air testing, leakage was discovered around the bushing terminal pate surfaces, which required complete disconnection of the generator leads and lowering of the bushings to facilitate gasket replacement. The external work was performed by JEA craft personnel, and the internal generator work by specialists from General Electric. Once completed, follow-up air testing results fell well within acceptable limits.

Back-feeding of the generator step-up transformer began on January 26, 2002, but was discontinued due to a build up of gases within the transformer. Testing revealed this to likely be the result of local oil overheating due to a short-term failure of the oil pumping and cooling system. Further testing is underway with results expected in the next 48 hours of this report date.

Unit 1 Startup continues, with activities underway relating to energization of medium voltage switchgear, DCS system and checkout of refurbished turbine auxiliary equipment.

NSRP Startup

Update Report

Progress Through February 2002

February 28, 2002

Summary

Unit 2 and Common Systems startup progress through the end of January 2002, stands at 80% complete with Unit 1 at 29%. This equates to 66% completion for overall project startup progress. Maintenance Readiness as of this date is 75% complete and Training is 93%. Detailed reports for each area follow.

Current Schedule Milestones (Complete Critical Activities schedules attached)

	Unit 2	Unit 1
First Gas Fire	* Dec 1, 2001	
Start Steam Blows	* Dec 10, 2001	Contract date
Turbine Roll	* Feb 12, 2002	For PSC
Initial Synchronization	* Feb 19, 2002	Shown
Solid Fuel Unsupported Fire	* Feb 14, 2002	
Preliminary Substantial Completion	Apr 12, 2002	May 15, 2002
Substantial Completion	Jul 11, 2002	

* Actual Dates

Material Handling

On February 10, 2002, solid fuel was first loaded into the Unit 2 silos. This represented the initial loaded operation of the fuel crushers and downstream conveyors. The fuel sampling system checkout has completed with final vendor certification to be conducted during unloading of the next fuel vessel in late March. The dust collection systems have undergone complete controls checkout and are now operational, with only minor issues remaining with the compressed air systems.

Limestone Preparation train ‘A’ has in the past week achieved output levels of between 40 and 50 TPH, with the product being conveyed to the Unit 1 silo. The ‘B’ train is next to be brought on line. Startup of the Ash Processing system has progressed well during the past month, with initial processing of ash slurry from the Unit 2 ash silos expected to come within the next five days following this report. The by-product storage area has been approved for temporary conditional use while remaining permit issues are completed.

Boiler Island

Initial solid fuel firing was achieved on the Unit 2 boiler of February 11, 2002. This was followed by initial bed ash removal on February 13, and then by both unsupported solid fuel firing and operation of the spray dryer absorber on February 14. Operation of the boiler since that time has primarily been targeted to support startup needs of the turbine.

Repairs of several boiler expansion joints referenced in the prior month’s report were completed during the first week of February. Though the design changes implemented on the metallic joint at the primary air to inlet plenum connection have proven effective, there continues to be additional work necessary. This and a number of fabric joints will be

addressed in a yet to be scheduled outage. Foster Wheeler has also identified a number of critical pipe support hangers that will require work with the unit down.

Startup activities on the Unit 1 Boiler include initial operation of all major boiler fans and the beginning of furnace airflow testing. Chemical cleaning of the water, main and reheat steam circuits has been completed. Initial gas fire and the start of steam blows are scheduled to commence during the first half of March.

Balance of Plant and Turbine Generator

On February 11, 2002, the main turbine was initially pre-warmed in preparation for rolling. On the day following, the turbine was accelerated to 1000 RPM's, and then to rated speed one day later. The unit was synchronized to the electrical grid for the first time on February 19, 2002, at 2124 hours.

At the time of this report, the unit is off line for balancing work, involving machining of the generator collector rings and exciter coupling, and expected to return to service this same date.

Complications reported last month regarding gas buildup in the generator step-up transformer, TG2, continue to be monitored closely. Rigorous testing and multiple internal inspections of the transformer failed to reveal the source of the gas. Controlled re-energization of the transformer in incremental steps as specified by the manufacturer ultimately allowed the transformer to be placed into normal service, with no local detection of gas. Oil samples continue to be extracted for analysis, which have shown low, but slightly increasing levels of gas in a dissolved state. The transformer will remain under close observation, and contingency plans are underway should repair work be required.

Initial operation of the turbine driven boiler feed pump on re-circulation has been accomplished, with normal operation planned once the unit is returned to service. Both condensate booster pumps have also been initially operated.

A number of condenser tube leaks have occurred within the past month, for which the cause has been determined and corrective actions are being implemented. The tube leaks were localized to the uppermost tubes in the first column on the outboard side of the air removal passageway. Steam exiting from the LP Bypass piping was found to be impinging upon these tubes leading to fatigue and ultimate tube failure. Through a design error, baffle plates which were designed to deflect the steam from these tubes, were installed lower in the bundle, leaving the upper eleven tubes exposed. Interim actions have been to minimize bypass flow into the condenser until proper placement of the baffles and other corrective work can be completed, as well as plugging of the tubes which have been subject to fatigue, as additional failures are probable.

Major Unit 1 Startup activities now underway include lube oil flushes on the main turbine, seal oil and both boiler feed pumps, EHC system flush and stator cooling water flush. Initial operation of the condensate and circulating water systems is scheduled for the remainder of this week, along with resumed operation of the closed cooling water system.

NSRP Startup

Update Report

Progress Through March 2002

March 28, 2002

Summary

Unit 2 and Common Systems startup progress through March 27, 2002, stands at 82% complete with Unit 1 at 55%. This equates to 75% completion for overall project startup progress. Maintenance Readiness as of this date is 78% complete and Training is 93%. Detailed reports for each area follow.

Current Schedule Milestones (Critical Activities schedules updated 3/22/2002 attached)

	Unit 2	Unit 1
First Gas Fire	* Dec 1, 2001	* Mar 14, 2002
Start Steam Blows	* Dec 10, 2001	* Mar 22, 2002
Turbine Roll	* Feb 12, 2002	Apr 18, 2002
Initial Synchronization	* Feb 19, 2002	Apr 24, 2002
Solid Fuel Unsupported Fire	* Feb 14, 2002	Apr 25, 2002
Preliminary Substantial Completion	May 6, 2002	June 10, 2002
Substantial Completion	Aug 4, 2002	Sep 8, 2002

* Actual Dates

Balance of Plant and Turbine Generator

Unit 2

Balancing work on the generator collector rings and exciter coupling, underway as of the last report, was completed and the unit placed back on line on March 1, 2002, at 0330 hours. The unit remained on line until the afternoon of March 4, at which time a trip occurred during a loss of power to the startup bus and to the operating instrument air compressors. Efforts to return the boiler to service were not successful, as further explained below, and the outage planned for March 10 was started early.

While the unit was off, inspection of the turbine lube oil reservoir indicated contamination levels sufficient to warrant inspection of all turbine bearings and flushing of the oil system. Bearing inspection revealed very minor damage from contamination, and the numbers 1, 2, 3, 5, 6 and thrust bearings were cleaned and re-installed. The number 4 bearing had unrelated damage, likely from vibration. It was repaired and re-installed, with all bearing work completing on March 24. The flush was contracted and is in the final stages as of this writing. The 2B boiler feed pump and fluid drive were also inspected, cleaned and flushed.

During the outage, the planned condenser modifications were made, increasing the shielding around the discharge from the LP Turbine Bypass.

Though further visual gassing from the generator step-up transformer, TG2, has not occurred, oil samples continue to indicate a small buildup of dissolved gas. Plans have progressed with the purchase of a spare transformer, with delivery expected within the next week. Due to the small increases in combustible gasses, shipment of the gassing transformer back to the manufacturer for repair is not deemed urgent at this time.

Unit 1

Major startup activities during March include completing the main turbine lube oil and seal oil flushes, and the start of the generator air test. Initial operation of the turbine on turning gear is scheduled to begin within the week. The EHC system flush and restoration were also finished, with stroking of turbine valves to be coordinated around steam blows.

The 'A' boiler feed pump was initially operated on March 16, 2002 following completion of the oil flush, restoration and alignment of the pump, fluid drive and motor. During initial uncoupled operation of the motor, a manufacturing discrepancy of the motor lead to motor junction box connection was discovered. This was corrected by factory personnel, who made temporary butt splices to properly connect the leads. At a future point, the motor will be returned to the manufacturer for permanent repair. Operation of the boiler feed pump was otherwise acceptable. NOTE: When these repairs are made, the motor will also be configured to match the 2A BFP and the yet to be received spare BFP motors. This will result in all three motors being interchangeable.

Boiler Island

Unit 2

Following the unit trip on March 4, 2002, which included both a boiler trip and slumping of the bed, back sifting of bed material was experienced from the boiler intrex sections. In efforts to correct this, large amounts of furnace bed material were inadvertently transferred over into the cyclones. On March 7, the bed material returned to the furnace, causing burn through of the 'C' primary air to elbow burner fabric expansion joint. This prompted an early start to the planned outage. Follow-up inspection also revealed damage to the 'C' intrex weir wall ahead of the return section.

Major boiler work performed during the outage includes modifications to all furnace intrex sections, with doubling of the thickness of the above referenced weir walls, and adding two additional lateral support arches and one horizontal buckstay to each of these walls.

In an effort to minimize future back-sifting of bed material, the air supply to the intrex return zones, previously supplied from primary air, was connected instead to intrex air. Also, the boiler control logic was changed to cause the intrex and seal pot blowers to continue to operate following a boiler master fuel trip. Further, the standpipes from these blowers were internally lengthened where the back sifting occurred, and were fitted with covers, designed to block reverse flow of bed material while permitting normal flow of air.

To prevent backup of bed material from the intrex into the lower cyclone sections, ten additional fluidization airports were added to the downleg at the inlet to each intrex.

Other work on the boiler during this outage included correcting a number of critical pipe supports and making necessary repairs throughout the boiler.

As of this report, the boiler work has been completed and curing of the new refractory is underway.

Unit 1

Air flow testing of the boiler began on February 27, 2002, and was completed on March 3, with the exception of parts of the secondary air sections. Boiler operation was suspended at this point to make modifications to the primary air to grid expansion joint supporting structures, based on design changes that had been required on Unit 2. Pinning of the grid nozzles began during these modifications and will be completed following steam blows based on calculations made during air flow testing.

Initial gas firing of the boiler was achieved on March 14, 2002. Refractory curing followed, beginning at 1400 hours on March 15, but was suspended the following day due to problems encountered relating to growth in the primary air to grid expansion joints. The control rods that provide initial stretch and maintain alignment of the metallic joints were found to have bound against their support platforms, causing bending of the platforms. These and the control rods were repaired/replaced. Internal inspection of the refractory in close proximity indicated no damage. Curing was resumed on March 18, but had to be stopped again on March 19 when a division wall tube leak occurred. Once corrected, the cure was completed on March 22

Steam blows began at 0807 hours on March 22, 2002. With the piping and blow path proven, phase one blows of the main steam system progressed to the 500 PSIG range by midday and then to 600 PSIG by early evening. Leakage on the main stop valve cover required bolt re-torquing during that night and 600 PSIG blows were resumed at 0357 hours the following morning. During blow number 37, a heavy impact against the steam blow target was noted, which resulted in severe bending of the target. Inspection revealed that the main stop valve temporary protective covers had separated and been blown into the discharge piping. The stop valves were examined and found to be undamaged, with final inspection of the bypasses to be done following steam blows. The protective covers were replaced and steam blows resumed on the afternoon of March 25.

Material Handling

Major efforts through the month of March have focused on bringing the ash processing system into service. Fly ash has been pumped to the by-product storage area with relative levels of success; however, processing of bed ash has yet to be satisfactorily achieved. Various system adjustments and operational methods continue to be utilized as this remaining area of startup continues. Contingency plans are in place should the silo capacity be reached before succeeding in moving the bed ash through the dense slurry system.

Startup operation of the limestone preparation system also continues, with the objective of obtaining rated output to both units on a repeatable and continuous basis. The fuel sampling system checkout has completed with final vendor certification to be conducted during unloading of the next fuel vessel, currently scheduled for later April.

NSRP Startup

Update Report

Progress Through April 2002

April 29, 2002

Summary

Unit 2 and Common Systems startup progress through April 28, 2002, stands at 85% complete with Unit 1 at 80%. This equates to 83% completion for overall project startup progress. Maintenance Readiness as of this date is 80% complete and Training is 93%. Detailed reports for each area follow.

Current Schedule Milestones (Critical Activities schedules updated 4/19/2002 attached)

	Unit 2	Unit 1
First Gas Fire	* Dec 1, 2001	* Mar 14, 2002
Start Steam Blows	* Dec 10, 2001	* Mar 22, 2002
Turbine Roll	* Feb 12, 2002	May 3, 2002
Initial Synchronization	* Feb 19, 2002	May 9, 2002
Solid Fuel Unsupported Fire	* Feb 14, 2002	May 10, 2002
Preliminary Substantial Completion	May 25, 2002	June 25, 2002
Substantial Completion	Aug 23, 2002	Sep 23, 2002

* Actual Dates

Balance of Plant, Turbine Generator and Boiler Island

Unit 2

On April 4, 2002, the unit was placed back on line at 1624 hours. This followed a 31 day outage, during which time previously reported repairs were made to the boiler intrex sections, turbine bearings and other various equipment. Thus far in the month, the unit has been placed on line 7 times, for a combined run time of 322.9 hours. (For complete detail, see the synchronization log under the “Startup” tab.) During operation, unit load has reached and sustained 85% of rated capacity, equating to approximately 250 MW’s for extended periods.

Major effort has been extended in the analysis or the boiler’s fuel burning performance, including initial burning of petroleum coke on April 14. Pet coke and coal were blended at an approximate 50/50 ratio, and initial results, though the burn time has been minimal, are considered to be good.

Following loss of the unit on April 16 due to a failed expansion joint on the ‘B’ stripper cooler, the unit was left off line to make boiler design modifications as well as repair of the expansion joint. Utilizing data from prior operation, it was decided that approximately 50% of the boiler division water walls would be removed. This equates to approximately 10% of the boiler’s evaporative heating surface area, and the reasoning for their removal is to decrease the heat exchange in this section of the boiler. The effect will be an increase in furnace bed temperatures which are closer to the design range, and which are essential to satisfactory pet coke combustion. Further modifications were also made to the intrex sections, lowering the bypass walls by 18 inches. The effect of this is designed to permit greater control of the bed flow through the intrex superheating

sections, as well as bypassing these sections. This too will aid in increasing the furnace bed temperature, as well as improve control of superheat steam temperatures.

The stripper cooler expansion joint failure was found to be the result of inadequate design. Repairs included modification in the joint's design, as well as additional use of air to assist in the sealing of the joint and in purging internal ash accumulation.

During this period, previously experienced problems with the generator synchronization circuitry have been corrected. Full manual and automatic synchronization of both generator breakers is now functional, as well as the ability to close the second breaker.

At the date of this report the unit is undergoing refractory cure with sand loading to follow. Expected re-synchronization is Tuesday, April 30, 2002. Once on line, the silos will be burned out of the blended fuel mixture, followed by loading of straight coal, which is required for specific emissions testing scheduled for the coming week.

Unit 1

Steam blows were completed on April 7, 2002 at 0949 hours. 269 blows were required to clean the main and reheat steam circuits. During steam blow restoration and based upon operating data collected on Unit 2, it was decided to remove water wall surface area, identical to that described above for Unit 2. Further, the modifications made previously to Unit 2's intrex sections were replicated on Unit 1, with the addition of removing 30 inches from the top of the bypass walls. As of this writing, the intrexes on both units are the same with the exception of the height of this wall, which was purposefully cut to different heights in order to evaluate the resulting effects.

Major turbine and balance of plant startup activities for this period include initial turning gear operation and establishment of condenser vacuum. Generator synchronization circuitry testing has been completed satisfactorily, along with back feeding of the step-up transformers and testing of the auxiliary load fast transfer scheme. All turbine valves have been stroked and set for turbine operation.

Due to unacceptable progress, the 1B Boiler Feed Pump oil flush was suspended and the system chemically cleaned. This was followed by completion of the oil flush and restoration of the pump and fluid drive.

Generator gas leakage testing continues at the time of this report. Though sources of leakage have been found and corrected, the rate of loss remains at approximately 2.5 times acceptable levels.

Condensate system operating pressures experienced during startup have revealed that the new condensate pump output pressure is greater than the rating of the existing condensate polisher vessels. Following review of available options, the short-term corrective action of installing a pressure control valve ahead of the polishers has been completed, with final tuning of the valve in progress at this time. This also included installation of stepped relief valves ahead of the polisher, for protection in the event of failure of the pressure control valve. This installation has also been completed. The long-term solution of replacing the polisher vessels with those of increased pressure rating is currently in the final stages of planning. Based upon the required time for manufacture of the vessels, completion of this solution is anticipated for the Fall of this year.

At the date of this report the unit is undergoing refractory cure, which will be followed by initial loading of sand. Tuning of the turbine bypass system will progress concurrently. Initial turbine roll is anticipated for late in the week, with 7 days allocated for final turbine trip testing and balancing as required. Unit synchronization will then follow.
Common

The primary Unit 1 and 2 Startup Transformer, T-21, experienced the second feeder cable failure during this period. This, coming shortly after the previous failure, has elevated the need to replace all 9 feeder cables. Replacement of the bad cable is planned immediately, with engineering for the procurement and installation of all cables underway.

Material Handling

Major efforts continue in the startup of the ash processing system, with the transporting of bed ash remaining the primary challenge. Support from system and equipment designers and equipment suppliers has increased, however, bed ash has not yet been satisfactorily processed to the by-product storage area to date.

During April, two fuel ships were received, each consisting of 15,000 tons of PSC test coal. While unloading and fueling the unit, final checkout of both the as-received and as-fired fuel sampling systems was completed.

Final startup and tuning of the limestone preparation system continues, the objective being to obtain rated output to both units on a repeatable and continuous basis.

Various structural and controls modifications are underway across the material handling system, in efforts to optimize system performance. These include:

- Modification to the head-end plugged chute switches on all the conveyors
- Installation of plows on the stacker/reclaimer portals in order to eliminate coal dragging
- Replacement of inadequate fasteners on the rake chains on both stacker/reclaimers
- Fabrication and installation of a deflector on the stacker boom on the ‘B’ stacker/reclaimer
- Installation of a soft-start system on both tripper cars
- Modification of the auxiliary hopper on the ship unloader
- Modification of the grizzlies over the limestone reclaim hoppers

NSRP Startup

Update Report

Progress Through August 2002

Aug 28, 2002

Summary

This report covers the period of May 2002 through August 2002.

Unit 2 and Common Systems startup progress through August 28, 2002, stands at 86% complete with Unit 1 at 83%. This equates to 85% completion for overall project startup progress. Maintenance Readiness as of this date is 86% complete and Training is 92%. (Training indicates a reduction from 93% to 92% complete due to additional courses being added during the period, of which a portion are not yet complete.) Detailed reports for each area follow.

Milestones Dates

	Unit 2	Unit 1
First Gas Fire	Dec 1, 2001	Mar 14, 2002
Start Steam Blows	Dec 10, 2001	Mar 22, 2002
Turbine Roll	Feb 12, 2002	May 2, 2002
Initial Synchronization	Feb 19, 2002	May 29, 2002
Solid Fuel Unsupported Fire	Feb 14, 2002	May 31, 2002
Preliminary Substantial Completion	TBD	TBD
Substantial Completion	TBD	TBD

Balance of Plant, Turbine Generator and Boiler Island

Unit 1

Summary:

Total run time on the unit through the date of this report is 1,549 hours verses 648 hours off line, resulting in an online percentage of 70.5%. The unit has been synchronized 23 times to date with the duration of the current run being 18 days. For further detail, see the attached Synchronization Log.

Major Activities:

Apr 26 Boiler safety setting

Apr 27 Condenser vacuum initially established

May 1 Fine screens removed following completion of main turbine lube oil flush

May 2 Initial roll of main turbine

Once rolled to 1,000 RPM's, the number 2 bearing temperature spiked to over 300 Deg. F. and the turbine was rolled back down for inspection. The bearing was found to be severely wiped and was removed and shipped off site for re-surfacing. A check of oil system pressure and temperatures revealed no abnormal conditions, nor did visual inspection of the oil system or

supply piping to the bearing. During re-installation, minor adjustments were made to the bearing oil seal and alignment, though neither were suspected to any large degree of having been the root cause of the bearing failure.

The turbine was next rolled to 1,000 RPM's without incident on May 9, following which it was placed on turning gear. On May 10 the turbine was rolled with the intention of proceeding to rated speed. At 1,700 RPM's however, the number 1 bearing temperature spiked to over 300 Deg. F., and the turbine was again rolled down for inspection. Again the bearing was found to be wiped, and also as before, initial findings of the equipment, operating parameters and condition of the lube oil, including viscosity analysis, revealed no apparent cause of the bearing failure.

Following shipment of the bearing for re-surfacing, it was determined to inspect all turbine and generator bearings. Minor amounts of debris were found in a number of locations, and though inconclusive as the failure cause, it was decided to flush the complete lube oil system, including the turbine driven boiler feed pump and the transfer piping. This was completed on May 26.

The turbine was rolled again on May 27, and though vibration was initially encountered and corrected through the addition of balance shots, rated speed was achieved early on May 28 with all conditions indicating normal.

Though the final cause of these bearing failures was not determined, two probable causes are generally accepted.

1. Oil system contamination, likely to have been introduced through the transfer piping. (The lube oil had been transferred out of the reservoir following the May 9 roll to permit replacement of the pressure controlling orifice, and then returned on May 10 prior to turbine roll on that date.) This theory provides no explanation for the first bearing failure.

2. Overheating of the number 1 and 2 bearings during steam blows. (The stop valve covers installed during steam blows to protect the valve plugs were struck by large debris during one of the blows, causing the covers to be blown clear. Steam blows were suspended while the valves were inspected and the covers replaced. The covers from Unit 2 were the only ones immediately available, and were installed, as those from Unit 1 were damaged beyond use. As these covers did not seal as well as the prior ones, an amount of steam was noted to have leaked by, and caused heating of the turbine shift, which was then transmitted to the number 1 and 2 bearings. Though hand held and permanently installed instrumentation was monitored and indicated a maximum temperature of approximately 215 Deg. F. which is within acceptable limits, the possibility exists that stratification resulted in higher, undetected and unacceptable temperatures.)

May 29 Initial synchronization of the unit at 1057 hours

May 31 Turbine overspeed testing

Jun 18 Decision to operate unit for system reliability purposes

In light of the continued difficulties encountered to date while burning 100% petroleum coke on Unit 2, JEA decided to burn a blend of approximately 70% coke and 30% coal on Unit 1 for approximately 90 days.

Jul 28 Unit achieved and sustained full load operation

Jul 30 Preliminary Substantial Completion Testing (PSC) on coal

PSC testing on coal was completed with initial results indicating satisfactory results in all performance and environmental respects. Granting of PSC certification is pending final review and verification of the test report and resolution of commercial issues.

Aug 14 Turbine performance testing

Initial results of the test indicate the possibility that heat rate is higher than guaranteed limits by less than 1.0%. Final tabulation and evaluation of the results is pending.

Common

Apr 29 Major electrical system disturbance

During the late afternoon on this date, JEA experienced a loss of most sections of the power grid. This included incoming feeds to both Unit's 1 and 2. At the time, though neither unit was on line, both were in preparation for startup, with turbine warming, refractory curing and boiler sand injection underway. No equipment damage was sustained and both units resumed startup during the night and through the following morning with minimal schedule impact.

Unit 2

Summary:

Total run time on the unit through the date of this report is 2,295 hours verses 2,268 hours off line, resulting in an online percentage of 50.3%. The unit has been synchronized 24 times to date with the duration of the current run being 19 days. For further detail, see the attached Synchronization Log.

Major Activities:

May 5 Unit achieved and sustained full load operation

May 12 Transition to 100% petroleum coke

May 20 Preliminary Substantial Completion Testing (PSC) on coke

Jun 29 PSC testing on coal

During the initial PSC test on coke, unit load had to be reduced to approximately 60% due to bed material pluggage in the 'C' Cyclone, resulting in only partial completion of the test. The PSC test on coal was completed without incident. Initial indications of the performance portion for each test appear satisfactory. The environmental portions which were either incomplete, questionable or non-passing (SO^3 emissions, lead emissions and certification of NOx calibration gas), have all since been re-tested with initial results indicating each to be resolved. Granting of PSC certification is pending final review and verification of the test report and resolution of commercial issues.

There were three events wherein the lower section of one of the boiler cyclones became partially or completely full of bed material. In each case, an outage was ultimately required to remove the agglomerated material, though short term and partial load operation was possible in some cases. The associated outage start dates, durations, possible causes and modifications made are summarized as follows:

- May 31 13.9 Days

  Stated probable cause(s): Reduction of air flow through affected intrex (C) over a period of hours leading to material backup into the cyclone.

  Modifications: Installation of additional fluidizing air ports on cyclone outlet, alteration of air supply to intrex SH cell entrance area to higher pressure air, alteration of air supply to intrex return channel and duct, additional cyclone rod-out ports.

- Jul 7 12.3 Days

  Stated probable cause(s): Inordinately high bed levels (30 to 35 inches) over several days resulting in excessive solids circulation accompanied by a number of bed excursions.

  Modifications: Operational limitation of bed level to between 15 and 20 inches. Should bed level exceed 20 inches, load is limited to 90% maximum until normal conditions return. Minimize rapid load changes on the unit. Modify stripper cooler air supply from hot primary air to cold primary air in compartments 1 and 2 and reduce air velocities. This should improve stripper cooler performance and reduce return of fines to the furnace. Improve stripper/cooler emergency spray-nozzle performance by increasing air purge time and improving atomization.

- Jul 27 13.3 Days

  Stated probable cause(s): None

  Modifications: Addition of water spray to a small portion of the 'A' Intrex superheat cell grid nozzles and a downward view-port on the 'A' cyclone.

Early August Decision to operate unit for system reliability purposes

With the continued difficulties encountered while burning 100% petroleum coke, and the relative success on Unit 1 while burning a blend of approximately 70% coke and 30% coal, JEA decided to burn a similar blend on Unit 2 for the duration of the peak summer load season.

Note: Unless otherwise indicate, activity dates shown are start dates

Material Handling

The major focus of the startup activities in Material Handling for the period has been in the ash processing area. A 50/50 blend of fly ash and bed ash has been successfully processed, which is a major improvement, though there are still buildup and pluggage problems. Mechanical and control modifications have been made to assist with these problems and more are anticipated.

The BSA has still not been released completely with only 7 acres of the total 27 available for use. This has caused original operating plans and processes to be changed to accommodate utilizing only the limited area.

In the past four months, deliveries have been as follows:

- Limestone 2 shipments totaling 85,000 tons

- Pet coke 4 shipments totaling 120,000 tons

- Coal 8 shipments totaling 136,000 tons.

Fine-tuning of the limestone preparation system continues with the main discrepancy at the present time being the inability to convey the maximum rated capacity to Unit 1 without having pressure differential problems.

Several equipment, structural and control system modifications have been performed to allow for optimization of the Material Handling System performance. Some of these modifications include:

- Installation of Micro Logix controllers on all dust collection and dust suppression systems to minimize fugitive dust in the fuel handling areas
- Installation of a reversing contactor for C-1 conveyor to purge rainwater from the belt
- Installation of radar level detectors for limestone day bins
- Replacement of original limit switches in ash processing with a more reliable switch that is capable of performing in a wet, corrosive environment
- Installation of a new computer and HMI controller in the Material Handling control room for multiple unit monitoring of the ash processing system
- Installation of a Miltronics electronic sump controller for Sump 12
- Installation of pendant controls for ash silo load-out chutes
- Installation of digital displays for all ash handling variable frequency drives
- Installation of bypass purge controls for the burners in limestone preparation to allow for safe purging of landfill methane gas
- Installation of vibrators and associated controls for the ship unloader, hopper and the head chutes in limestone preparation
- Modification of the controls for the ship unloader portal conveyor to eliminate overloading C-1 conveyor when receiving self-unloading ships
- Modification of skirtboard systems throughout the material handling system
- Installation of slider beds at the load area of L-A, L-B and L-C
- Modification and set up of office trailer for BSA
- Fabrication and installation of removable screens in bed ash processing systems
- Added dust suppression system to conveyors C-12 and C-13
- Modifications to loading zones of C-12 and C-13 to contain and control fugitive dust
- Modifications to C-8 and C-9 emergency reclaim hopper flow control gates
- Installation of BSA sump monitoring equipment in the Material Handling control room
- Installation of drainage trenches and floor drains in the ash handling area
- Continued modifications and improvements to the stacker/reclaimers and ship unloader control system logic
- Modification of the majority of the access doors in limestone preparation to allow for safer and more efficient access to the system

APPENDIX 3

START-UP MODIFICATIONS

Significant modifications which were required as a result of Unit 2 start-up and testing activities are described on the following pages. These modifications are sorted by the "Particular Process or Item of Equipment" then by "Date Encountered (Approx)". In addition, the prefix to the "Mod. No." indicates the following four categories of modifications:

Modification Number Prefix	Category Description
FW-	Modifications by FW
BV-	Modifications issued by B&V
JEA-	JEA Modifications prior to Phase 1 Completion Items
JEA WTS	JEA Phase 1 Completion Modifications

Note that the Record ID numbers were assigned for ease of identification and reference purposes, and are not intended to be sequential.

Significant modifications which were required as a result of Unit 2 start-up and testing activities

Record ID	Description of Problem	Particular Process or Item of Equipment	Description of Modification Implemented	Intended Impact of Modification	Evaluation of Results of Modifications	Cost of Mods (000's)	Remarks/Cost Notes	Date Encountered (Approx.)	Date Implemented (Approx.)	Mod. No.	Keywords
1	Inadequate access to the PA, SA, and ID Fans	Access Platforms, PA, SA, and ID Fans	Fan access platform modifications were partially installed by FW. JEA completed installation of handrails, stairs, and toeplates.	Provide adequate access to the fans.	Successful	67.2	FW Letter 2.1-1083, Rev. 1	Jan-02	Apr-02	FW-027 and JEA WTS 16-02	Access Platforms, Fans
3	Location of the Air Handling Unit for the ash blower building restricted access to Sump 12.	AHU, Ash Blower Building	Relocated Air Handling Unit, and added structural steel for supporting the extension of ductwork.	Allow better front end loader access to Sump 12 for cleaning it.	Successful	N/A	ECN S-0071 and S-0070. WP S-025. See Note 1.	Sep-01	Jan-02	BV-001	AHU
4	DCS limited on ability to expand number of control locks	AQCS	Added 4 Bridge Controller for DCS	Correct limitation	Successful	50.3		Jan-03	Feb-03	JEA WTS 07-25	AQCS, DCS
5	AQCS was not complete and fully tested at the time FW left the site.	AQCS	Provide the services of AQCS Shift Technical Advisers to complete startup and tuning of systems	Reliable and efficient operation of the AQCS.	Partially successful, efforts continuing	190.2		Jan-03	Jan-03	JEA WTS 17-03	AQCS
6	High levels of condensation in plant air systems	All boiler island systems	Added two receivers with automatic drains	Separate and remove condensation	Partial success, auto drains require further attention	2.8		Feb-03	Feb-03	JEA WTS 07-27	Boiler, Compressed Air
7	Erratic Mag flow meter performance	AQCS	Replace Mag flow meters electronics and re-pipe to ensure meter is flooded at all times	Stabilize performance	Successful	12.4		Feb-03	Mar-03	JEA WTS 07-28	AQCS, Flow Meters
8	Head tank vent discharged material into penthouse areas	AQCS	Re-piped vent to drain line	Capture vented liquids	Problems continue with vent, re-designing	15.1		Feb-03	Mar-03	JEA WTS 07-29	AQCS, Slurry Head Tank
9	Pluggage of lime feed line and in horizontal portion of gravity return from SDA head tank	AQCS	Re-piped pump suction lines and lime feed line. Re-designed and replaced horizontal lines with more vertical lines	Reduce pluggage	Work to date successful	95.6		Feb-03	Mar-03	JEA WTS 07-30	AQCS, Lime Feed
11	Repeated failure of seals in slurry pumps	AQCS	Replace with alternate seal design and add flush water	Reduce failures	Failures substantially reduced	46.1		Sep-02	Oct-02	JEA WTS 07-32	AQCS, Pump Seals

Significant modifications which were required as a result of Unit 2 start-up and testing activities

Record ID	Description of Problem	Particular Process or Item of Equipment	Description of Modification Implemented	Intended Impact of Modification	Evaluation of Results of Modifications	Cost of Mods (000's)	Remarks/Cost Notes	Date Encountered (Approx.)	Date Implemented (Approx.)	Mod. No.	Keywords
12	Pluggage in slurry distribution header in SDA	AQCS	Install recirculation line at end of header	Reduce nozzle pluggage	Pluggage substantially reduced	21.1		Feb-03	Apr-03	JEA WTS 07-33	AQCS, Slurry Feed
13	AQCS diaphragm valves not reliable, diaphragms and limit switches failing	AQCS	Replace with pinch style valves and new limit switches	Reduce failures	Successful	69.4		Feb-03	Apr-03	JEA WTS 07-34	AQCS, Valves
14	Nozzle faces being damaged during insertion	AQCS	Re-design and replace guides	Reduce damage	Successful	17.1		Feb-03	May-03	JEA WTS 07-35	AQCS, Nozzles
16	Frequent pluggage of the recycle ash nozzles and final filters	AQCS	Changed vibrating filter screens from 8 mesh to 20 mesh.	Remove a larger fraction of the grit from the slurry.	Marginal success, further modifications required	N/A	See Note 1.	Apr-02	May-02	FW-042	Recycle Ash Slurry, Screens
17	Ash recycle bin outlet chute work and rotary valves have not operated reliably.	AQCS, Ash Recycle	Chute work and purge air modifications to ash recycle bin outlet rotary valves.	Improve operation of ash recycle system.	Equipment modification successful	7.0		Jan-03	Apr-03	JEA WTS 07-11	Recycle Ash, Rotary Valves
18	Recycle mix tank was not properly vented	AQCS, Ash Recycle	Install vent system to remove steam from recycle mix tank, vent back to baghouse inlet.	Eliminate steam and dust emissions.	Successful	170.4		Jan-03	Apr-03	JEA WTS 07-12	Recycle Ash, Vent
19	Pluggage of in tank suction strainer and piping to the Recycle Slurry Transfer Pumps.	AQCS, Ash Recycle	Replace pump impellers with open design impellers	Eliminate recycle slurry transfer pump suction pluggage problems.	Successful	3.7		Jan-03	Apr-03	JEA WTS 07-13	Recycle Slurry Transfer Pumps
20	Recycle slurry screener has not operated successfully.	AQCS, Ash Recycle	Research, test and install an acceptable recycle slurry screener	Improve operation of ash recycle system.	In progress	87.3		Jan-03	May-03	JEA WTS 07-14	Recycle Slurry Screener
22	Operation of the atomizing air compressors has not been reliable, due to cooling system controls.	AQCS, Atomizing Air Compressors	Modify control wiring by installing individually fused supplies for each circuit	Improved reliability of the atomizing air compressors.	Not Yet Started	0.0		Jan-03	N/A	JEA WTS 07-20	Atomizing Air Compressors, Controls

Significant modifications which were required as a result of Unit 2 start-up and testing activities

Record ID	Description of Problem	Particular Process or Item of Equipment	Description of Modification Implemented	Intended Impact of Modification	Evaluation of Results of Modifications	Cost of Mods (000's)	Remarks/Cost Notes	Date Encountered (Approx.)	Date Implemented (Approx.)	Mod. No.	Keywords
24	Fabric Filter outlet damper limit switches did not operate properly.	AQCS, Fabric Filter	Install limit switch landing pad adjustments.	Improve limit switch operation.	Successful	0.9		Jan-03	Apr-03	JEA WTS 07-24	Damper, Limit Switches
25	Inadequate ash removal from baghouse hoppers.	AQCS, Fabric Filter	Install rappers for baghouse hoppers	Facilitate ash removal from hoppers.	Not Yet Started	0.0		Jan-03	N/A	JEA WTS 14-08	Fabric Filter, Hoppers
26	Branch connections from slurry ring header did not have manual isolation valves ahead of the automatic valves.	AQCS, Lime Slurry	Install manual isolation valves ahead of automatic valves on slurry ring header.	Allow on-line maintenance of automatic valves.	Successful	8.6		Jan-03	Apr-03	JEA WTS 07-05	Lime Slurry, Valves
27	Pluggage of the final filter in the lime slurry feed to the SDA.	AQCS, Lime Slurry	Changed design of final filter piping and valves to improve final filter flush	Reduce nozzle pluggage	Successful	67.5		Jan-03	Apr-03	JEA WTS 07-07	Lime Slurry, Final Filter
28	Air side pluggage of SDA nozzles.	AQCS, Spray Dryer Absorber	Install 7 mm nozzles and re-balance and re-tune slurry and compressed air pressures.	Reduce nozzle pluggages.	Successful	81.9		Jan-03	Mar-03	JEA WTS 07-01	SDA, Nozzles
29	Original DCS programming did not allow for remote starting and stopping of individual SDA spray nozzles.	AQCS, Spray Dryer Absorber	Modify DCS program and graphics to facilitate remote start and stop of individual nozzles.	Allow remote start and stop of individual nozzles via the DCS.	Successful	0.0		Jan-03	Apr-03	JEA WTS 07-06	SDA, Nozzles
30	Pluggage of drains from the SDA penthouse.	AQCS, Spray Dryer Absorber	Modify present SDA drain piping to eliminate horizontal runs.	Eliminate pluggage of drain lines.	Successful	23.3		Jan-03	Apr-03	JEA WTS 07-08	SDA, Penthouse, Drains
32	The only water source available for washdowns in the ash silo area was potable service water.	Ash Processing	Two hose connections were added at each ash silo, supplied from the Reuse Water system.	Facilitate area washdowns, minimize use of potable service water for washdowns in this area.	Successful.	N/A	ECN M-0048. See Note 1.	Oct-01	Feb-02	BV-002	Ash Silos, Washdown

Significant modifications which were required as a result of Unit 2 start-up and testing activities

Record ID	Description of Problem	Particular Process or Item of Equipment	Description of Modification Implemented	Intended Impact of Modification	Evaluation of Results of Modifications	Cost of Mods (000's)	Remarks/Cost Notes	Date Encountered (Approx.)	Date Implemented (Approx.)	Mod. No.	Keywords
33	Valve limit switches on the segregation and dump valves are not reliable.	Ash Processing	Evaluate condition of limit switches and actuators on the ash segregation and dump valves in the ash processing system under the ash silos.	Reliable operation of valve limit switches.	Generally Successful	0.0	Warranty Work	Jan-03	Apr-03	JEA WTS 14-02	Ash Processing, Valves, Limit Switches
34	The dense phase ash transport system for transporting fly ash and bed ash to the byproducts storage area (BSA) was not able to transfer all of the bed ash to the BSA.	Ash Processing, Bed Ash	Extensive system tuning and replacement of control components and sensors.	Capability to transport all of the Bed Ash generated to the BSA, and improved system reliability.	The highest bed ash to fly ash mix ratio achieved is a 50-50 mix, which still requires bed ash to be trucked periodically from the bed ash silos.	N/A	See Note 1.	Mar-02	Mar-02	JEA-006	Bed Ash
35	Extended start-up modifications to the ash processing system from the ash silos to the BSA resulted in frequent pluggages and system shutdowns, resulting in numerous ash dumps and large amount of ash spillage in the areas around the bottom of the ash silos. The originally designed drains from the ash silos to Sump 12 plugged with ash frequently.	Ash Processing, Drains	Installation of an open trench system along the north side of the ash silo foundations, with provisions to wash ash spillage directly into the trenches. Ash dump piping from the ash processing system was routed to the trenches.	Simplify clean-up of ash spillage around the ash silos.	Successful	155.0	WP M-185, WP M-187, WP M-189, WP S-030	Apr-02	Aug-02	BV-022	Ash Silos, Washdown
36	Loss of the 4160 volt start-up bus caused units running on the station service transformer to trip.	Auxiliary Power System	Power feeds for panel boards carrying critical loads were changed from the start-up bus to the normal bus.	Prevent unit trips on loss of the start-up bus.	Successful	N/A	Letter BV/JEA - 0417. ECN E-0061. See Note 1.	25-Jun-02	Jul-02	BV-027	Auxiliary Power
37	Low voltage equipment comes into and out of alarm multiple times on a fast transfer event.	Auxiliary Power System	Transfer scheme was changed to transfer at the fastest transfer mode.	Eliminate nuisance alarms during a fast transfer event.	Partial success, efforts continue	N/A	Letter BV/JEA - 0417. WP K-076. See Note 1.	25-Jun-02	Jun-02	BV-028	Fast Transfer
38	Starting the Unit 2 motor driven boiler feed pump caused other critical equipment to trip.	Auxiliary Power System	Expedited replacement of power feed cables for Transformer T-21. Revise transformer tap settings.	Minimize voltage dips when starting a motor driven boiler feed pump.	Partial success, efforts continue	N/A	Letter BV/JEA - 0417. See Note 1.	25-Jun-02	Jul-02	JEA-009	Auxiliary Electric System.
39	Inadequate auxiliary steam seal supply to the Unit 2 steam turbine during start-up, based on operating experience.	Auxiliary Steam, Turbine Seal Steam	Connection point on the auxiliary steam header was changed, and the auxiliary steam supply piping to the turbine seals was changed from 2" to 3".	Increase flow and pressure of auxiliary steam to the turbine steam seals during start-up of the turbine.	Successful.	N/A	ECN M-0054. See Note 1.	Jan-02	Mar-02	BV-006	Turbine, Steam Seals, Auxiliary Steam

Significant modifications which were required as a result of Unit 2 start-up and testing activities

Record ID	Description of Problem	Particular Process or Item of Equipment	Description of Modification Implemented	Intended Impact of Modification	Evaluation of Results of Modifications	Cost of Mods (000's)	Remarks/Cost Notes	Date Encountered (Approx.)	Date Implemented (Approx.)	Mod. No.	Keywords
41	Bed ash gate valves require excessive maintenance.	Bed Ash Handling	Rebuild/replace bed ash gate valves.	Reduced valve maintenance.	Partial success	34.9		Jan-03	Apr-03	JEA WTS 14-11	Bed Ash, Valves
42	Bed ash silo roof leaks.	Bed Ash Silo	Modifications to bin vent curbs on top of bed ash silos to eliminate roof leaks.	Eliminate roof leaks.	Successful	N/A	See Note 1.	Jan-03	Mar-03	JEA WTS 14-05	Bed Ash Silo
44	Pressure taps on combustor and intrex sections inaccurate due to pluggage. Physical configuration of pressure taps for the bed & INTREXes are not per original PyroPower standard design, and do not include purge air to the pressure tap connections.	Boiler/Instrument Connections	Modify pressure taps to include a sensing tube and purge air per PyroPower standard design. Includes development of maintenance procedures and training for maintenance of boiler pressure taps and purge air system.	Increase reliability in instrumentation	Successful	569.2		Feb-03	Apr-03	JEA WTS 3001, 06-01 and 06-02	Pressure Taps
45	The motor for BFP 2A was found to have the leads from the motor to the motor terminal box installed incorrectly in the factory.	Boiler Feed Pump 2A, Motor	Leads were swapped and butt spliced (temporary fix) by factory representatives	Proper motor operation	Temporary fix was successful. Motor to be returned to manufacturer for permanent fix.	0.0	Warranty Work	Mar-02	Mar-02	JEA-005	Motor, BFP
46	The BFP fluid drives were not equipped with provisions for remote vibration monitoring of shaft vibration.	Boiler Feed Pumps, Fluid Drives	Installation of axial and horizontal accelerometers on the inboard and outboard shafts.	Provide earlier indication of excessive shaft vibration.	Successful.	N/A	WP M-149. See Note 1.	Feb-02	Apr-02	BV-015	BFP, Fluid Drive, Vibration
47	Flow restrictions through the BFP suction strainers caused flashing through the boiler feed pumps, resulting in failure of the pump thrust bearings.	Boiler Feed Pumps, Suction Strainers	Differential pressure transmitters were installed across the BFP suction strainers, with readout and alarms to the DCS. BFP suction pressure transmitters were installed between the strainers and the BFP's, with output to the DCS, to monitor BFP suction pressure	Provide DCS indication and alarm of plugged BFP suction strainers, and of BFP suction pressure	Successful	N/A	WP K-048. See Note 1.	Jan-02	Feb-02	BV-010	BFP, Strainers, Pressure Transmitters
48	All critical steam and water piping and instruments on the boiler were not heat traced.	Boiler, Steam and Water Systems	Complete installation of a fully automated, industry standard heat tracing system on critical steam and water piping and instruments.	Prevent unit shutdowns during sub-freezing weather.	Successful	245.0		Nov-02	Nov-02	JEA WTS 15-01	Heat Tracing
49	Cyclone transfer piping (steam) and drain lines are not properly supported.	Boiler, Steam and Water Systems	Modify supports for cyclone transfer piping and drain lines.	Properly support piping.	Successful	2.1		Jan-03	Apr-03	JEA WTS 15-06	Cyclone Transfer Steam Piping

Significant modifications which were required as a result of Unit 2 start-up and testing activities

Record ID	Description of Problem	Particular Process or Item of Equipment	Description of Modification Implemented	Intended Impact of Modification	Evaluation of Results of Modifications	Cost of Mods (000's)	Remarks/Cost Notes	Date Encountered (Approx.)	Date Implemented (Approx.)	Mod. No.	Keywords
52	The original design of the BSA, approved by the FDEP during the project permitting process, was extensively reviewed and questioned by the FDEP during review of the application for an Operating Permit for the BSA.	BSA, Run-off Ponds	Sumps and sump pumps, with flow totalizers, were added to the leak detection sump for each of the run-off ponds.	Provide quantitative monitoring of leakage amounts through liners in the runoff ponds, so that corrective actions can be initiated when necessary.	Successful	N/A	WP M-191, WP K-088. See Note 1.	Aug-02	Nov-02	BV-030	BSA, Leak Detection Sumps
53	No visual indication of cooling water flow to the ID and SA Fan bearings.	Closed Cooling Water, ID Fans, SA Fans	Sight flow indicators were installed in the cooling water lines.	Provide a means to verify that cooling water is flowing to the bearings.	Successful.	N/A	See Note 1.	Aug-01	Sep-01	FW-015	ID Fans, SA Fans, Cooling Water
54	The closed cooling water surge tank was equipped with a single low level switch, which tripped the closed cooling water pumps, with no advance warning to the operators.	Closed Cooling Water, Surge Tank	Installation of two additional low-low level switches on the closed cooling water surge tank, to alarm low-low level.	Prevent unexpected trips of the closed cooling water pumps in the event of excessive water loss from the closed cooling water system.	Successful.	N/A	WP M-150, WP K-071. See Note 1.	Feb-02	May-02	BV-016	Closed Cooling Water Surge Tank, Level
55	Condensate polisher drains were not provided with a means for visually observing drain flows. Pressurized vents into the common drain header overflowed the sight gap.	Condensate Polisher	Installation of a section of clear PVC piping in the drain lines. The pressurized vents were routed separately to the drain trench.	Provide visual observance of drain flows. Prevent overflowing of the sight gaps in the common drain header.	Successful	N/A	WP M-172, WP M-177. See Note 1.	Jan-02	May-02	BV-008	Condensate Polisher, Drains
56	A number of permissive displays for the Condensate Polisher were missing from the DCS programming.	Condensate Polisher	Additional permissive displays were programmed into the DCS.	Provide more complete information to the control room operators of the operation of the Condensate Polisher.	Successful	N/A	WP K-075. See Note 1.	May-02	Jun-02	BV-025	Condensate Polisher
57	Make-up to the condenser was from bitter water (untreated demineralized water) only.	Condenser, Make-up Water	installation of a crosstie from the common sweet water (treated condensate) header, to allow gravity make-up to the condenser from the sweet water system.	Greater operating flexibility for make-up to the condenser.	Successful	N/A	WP M-173. See Note 1.	Jan-02	May-02	BV-009	Condensate, Make-up, Sweet Water
58	Condenser tube leaks caused by steam impingement from the LP Bypass discharge into the condenser.	Condenser, Tubes	Internal baffles originally designed to prevent impingement damage to the upper tubes from the LP bypass steam were modified and extended to provide additional impingement protection.	Protect tubes from additional impingement damage.	Successful	N/A	WP M-148. See Note 1.	Feb-02	Mar-02	BV-014	Condenser, Tubes

Significant modifications which were required as a result of Unit 2 start-up and testing activities

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59	Numerous cyclone pluggages requiring a unit outage to remove the ash from the cyclones.	Cyclones	Inspection and maintenance ports were added on the roof of the cyclone hood. Numerous additional poke holes were installed along the sides of the cyclones.	Facilitate removal of ash after a cyclone pluggage.	Evaluation continues, results pending	N/A	See Note 1.	Aug-01	Aug-01	FW-024	Cyclone, Poke Holes
60	Build-up of bed material between the INTREX and associated lower cyclone area after a boiler trip.	Cyclones, Downleg	Installation of 10 additional fluidizing air ports in the area between the outlet of the cyclone and its associated INTREX. Installation of density and level taps in the cyclone downleg and INTREX.	Prevent build-up of bed material in this area after a boiler trip, with the INTREX and seal pot blowers continuing to operate after a boiler trip.	Evaluation continues, results pending	N/A	See Note 1.	07-Mar-02	Mar-02	FW-038	Fluidizing Air
61	Numerous problems with backpass damper drives, including improperly installed linkages, binding of linkages, positioners that were not reliable and not repeatable, calibration and set-up of drives was incorrect, and no filter regulators on air supply to damper drives.	Damper Drives, Backpass Dampers	Linkages were modified, positioners were replaced, calibration and set-up was re-done, filter regulators were installed, and the ABB damper drives were replaced.	Reliable operation of dampers	Successful	N/A	See Note 1.	Aug-01	Nov-01	FW-021	Damper Drives
62	Numerous problems with PA, SA, and ID Fan damper drives, including improperly installed linkages, binding of linkages, positioners that were not reliable and not repeatable, calibration and set-up of drives was incorrect, and no filter regulators on air supply to damper drives.	Damper Drives, PA, SA, and ID Fans	Linkages were modified, positioners were replaced, calibration and set-up was re-done, filter regulators were installed, and the ABB damper drives were replaced.	Reliable operation of fans	Successful	N/A	See Note 1.	Aug-01	Nov-01	FW-009	Fans, Damper Drives
63	Damper positioners for the boiler fan dampers, PA burner booster blower dampers, PA to grid dampers, backpass dampers, and INTREX air flow control dampers were unreliable and not repeatable.	Dampers	Replaced positioners with positioners by different manufacturer	More reliable operation and control of the dampers.	Generally Successful	N/A	See Items 61 and 62	Feb-02	Feb-02	FW-029	Start-up Burners, Dampers

Significant modifications which were required as a result of Unit 2 start-up and testing activities

Record ID	Description of Problem	Particular Process or Item of Equipment	Description of Modification Implemented	Intended Impact of Modification	Evaluation of Results of Modifications	Cost of Mods (000's)	Remarks/Cost Notes	Date Encountered (Approx.)	Date Implemented (Approx.)	Mod. No.	Keywords
64	PA flow to grid control not reliable, high leakage through dampers affecting operation of startup burners	Dampers, PA and SA	Modify PA to grid damper to improve control of flow. Modify upper and lower front and rear SA dampers to improve control of flow. Reduced scope to one unit ($22K/unit).	Improve operation utilizing existing equipment	Partial success, further modifications required	17.3		Jan-03	Apr-03	JEA WTS 09-06	Dampers, PA, SA
65	During start-up, initial operation, and system tuning of various BOP systems, numerous DCS logic and programming changes were identified.	DCS	Logic and programming changes were investigated and implemented on site as required.	Improved system and unit operation and control.	Generally Successful	N/A	See Note 1.	Oct-01	Sep-02	BV-004	DCS
66	During start-up, initial operation, and system tuning of various boiler and AQCS systems, numerous DCS logic and programming changes were identified.	DCS	Logic and programming changes were investigated and implemented on site as required. This included extensive changes to the Burner Management System (BMS) logic.	Improved system and unit operation and control.	Generally Successful	N/A	See Note 1.	Oct-01	Jul-02	FW-026	DCS
67	Weak signal strength from the DCS time synchronization antenna for picking up GPS satellite signals resulted in unreliable time synchronization.	DCS	Installation of a signal amplifier for the antenna signal.	Reliable operation of the DCS time synchronization feature.	Successful	N/A	WP K-074. See Note 1.	Apr-02	Jun-02	BV-023	DCS, Time Synchronization
68	Boiler fine tuning was not completed before FW left the site.	DCS	Fix/develop fuel/air mixture curves.	Optimize boiler operation.	Generally Successful	N/A	Costs Covered by O&M.	Sep-02	Oct-02	JEA WTS 05-01	Boiler, DCS
69	Startup burner fine tuning was not completed before FW left the site.	DCS	Automate/develop startup burner fuel/air mixture curves.	Optimize start-up burner operation.	Successful	N/A	Costs Covered by O&M.	Sep-02	Oct-02	JEA WTS 05-02	Start-up Burners, DCS
70	Boiler SO2 removal rate was not fine tuned and automated before FW left the site.	DCS	Modify and tune SO2 control loops to provide automated SO2 control from boiler	Automate boiler SO2 removal rate.	Successful	N/A	Costs Covered by O&M.	Sep-02	Oct-02	JEA WTS 05-03	Boiler SO2, DCS
71	Fine tuning of automatic load runbacks was not completed before FW left the site.	DCS	Tune runbacks - either during plant conditions in upset (off normal) or as allowed by dispatch	Validate load runback capabilities.	Successful	N/A	Costs Covered by O&M.	Sep-02	Oct-02	JEA WTS 05-06	DCS
72	Motor amps indication and graphics are not input to DCS.	DCS	Add wiring to DCS I/O and DCS programming to include graphics to accommodate motor amp indications from all major 4160 V and above motors. MultiLens already provide output, wiring and DCS mods only required.	Provide motor amperage data to DCS for trending, and for operator information.	Successful	6.2		Jan-03	Jan-03	JEA WTS 05-09	DCS

Significant modifications which were required as a result of Unit 2 start-up and testing activities

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73	Failure of PA ring duct supports during pressure excursions	Ductwork, PA	Modify PA duct supports contingent on study. (13-1)	Increase support/anchorage	Successful	N/A	Costs Covered by O&M.	Jan-03	Dec-02	JEA WTS 09-05	PA Duct, Supports
74	Vibration of economizer tubes	Economizer	Installation of anti-vibration baffles in the economizer.	Minimize tube vibration.	Generally Successful	N/A	See Note 1.	Aug-01	Oct-01	FW-023	Economizer, Vibration
75	Boiler elevators are not reliable.	Elevators, Boiler	Added temporary elevator (further permanent solution being pursued)	Provide quick reliable access to upper elevations of boiler.	Successful	205.2		Jan-03	Mar-03	JEA WTS 16-01	Elevator
76	Unexpected and excessive growth and movement of the cyclones relative to the boiler. Expansion joints filled with ash. Breakage of ceramic tile in expansion joints.	Expansion Joints, Cyclone Inlet	Expansion joints restrained on one side on Cyclones A and C. Expansion joint restrained on both sides on Cyclone B. Swami rope and 1800 F hot stop fabric was installed in the interior of the joint to minimize ash infiltration. Stainless steel internal seals were also designed and installed.	Minimize damage to expansion joints.	Partial success, further long term modification to be made	N/A	FW Letter 2.1-1083, Rev. 1. See Note 1.	Feb-02	Jul-02	FW-030	Cyclone, Expansion Joints
77	A number of fabric type expansion joints in the air and flue gas ducts of the boiler failed, due to actual thermal movements being significantly different and greater than specified in the design.	Expansion Joints, Fabric	Expansion joint design was modified as required, by making the fabric portion wider, reinforcing the fabric, installing guide rods, or limiting the ductwork movement. As an interim measure, "barrel hoops" were installed on a number of hot PA fabric expansion joints, to reduce the stress in the belt and at the splices, and thus reduce the incidence of expansion joint failures.	Eliminate premature expansion joint failures.	Expansion Joints continued to fail. The "barrel hoops" are not an acceptable long term solution.	N/A	FW Letter 2.1-1066. See Note 1.	Feb-02	Mar-02	FW-032	Expansion Joints, Fabric Type, Ductwork
78	Continued failures of fabric type ductwork expansion joints.	Expansion Joints, Fabric	Pathway expansion joints were installed by FW in 3 hot PA and SA locations in Unit 1 , to allow comparison of performance to the Thorburn expansion joints in Unit 2.	Determine which manufacturer's expansion joints work best.	Generally Successful	N/A	FW Letter 2.1-1083 Rev. 1. See Note 1.	Apr-02	Jun-02	FW-039	Expansion Joints, Fabric Type, Ductwork

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79	Continuing failures of ductwork expansion joints. The PA to grid expansion joints have had a history of failures.	Expansion Joints, Fabric	Perform engineering study of all duct work movement and support related to fabric joints also include study of existing fabric materials. Evaluate results of new pillows and shields installed on Unit 2 PA Grid Expansion Joints. Repair/replace based on results of inspection.	Eliminate expansion joint failures.	Successful	64.1		Jan-03	Mar-03	JEA WTS 12-01 and 12-05	Ductwork, Expansion Joints
80	Potential failure of fabric type ductwork expansion joints	Expansion Joints, Fabric	Replacement of load-critical fabric type ductwork expansion joints.	Prevent load reductions due to expansion joint failures.	Successful	298.0		Jan-03	Apr-03	JEA WTS 12-02	Fabric Expansion Joints
82	Resonance failure of stripper cooler cold PA expansion joint to cell 2.	Expansion Joints, Primary Air	Replace cell 2 cold PA expansion joints with sleeve expansion joints to eliminate resonance failure. Unit 2 complete.	Prevent expansion joint failures.	Successful	1.7		Jan-03	Apr-03	JEA WTS 12-08	Stripper Cooler, Expansion Joints
83	Failure of front wall secondary air expansion joints.	Expansion Joints, Secondary Air	Modify existing joint to eliminate deformation due to over compression	Prevent expansion joint failures.	Successful	8.0		Jan-03	Apr-03	JEA WTS 12-09	SA Expansion Joints
84	Failed expansion joint at the inlet to Stripper Cooler B due to inadequate design.	Expansion Joints, Stripper Cooler	Revisions to design of the expansion joints for all four stripper coolers, including the addition of sealing air to the expansion joint to assist in sealing the expansion joint and to purge internal ash accumulations from the expansion joints. Permanent ash drains were piped from the expansions joints to the ash conveyors.	Eliminate premature expansion joint failures.	Not successful, further modifications required	N/A	FW Letter 2.1-1083, Rev. 1. See Note 1.	Apr-02	Apr-02	FW-040	Expansion Joint, Stripper Cooler
85	Stripper cooler inlet expansion joint failures.	Expansion Joints, Stripper Cooler Inlet	Unit 2 has already been inspected and addressed. Thorburn has redesign ready to ship and is willing to put in at cost on Unit 1 (metal covered type).	Prevent expansion joint failures.	Not successful, further modifications required	40.0		Jan-03	Apr-03	JEA WTS 12-07	Stripper Cooler, Expansion Joints
86	Build-up of ash in stripper cooler inlet expansion joints.	Expansion Joints, Stripper Coolers	Install FW provided automatic expansion joint drain valves and automate valves through DCS. Should be existing spare wiring capacity to perform job.	Automate drainage of ash from stripper cooler inlet expansion joints.	Generally Successful	9.8		Jan-03	Apr-03	JEA WTS 13-08	Expansion Joints, Stripper Cooler Inlet

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87	Level in the Heater #6 hotwell was very difficult to control.	Feedwater Heater #6 (LP)	High point in the normal drain from Heater #5 to the Heater #6 Hotwell was eliminated, and the Heater #5 start-up drain cooler vent line was connected to the normal operating vent from Heater #5.	Improve automatic level control in Heater #6 Hotwell.	Successful	N/A	WP M-166. See Note 1.	Apr-02	May-02	BV-021	Heater #6 Hotwell, Heater Drains
88	Frequent failure of tube side sentinel relief valves on the HP feedwater heaters.	Feedwater Heaters (HP)	Replaced with upgraded reseatable relief valves.	Minimize failure of tube side relief valves on HP feedwater heaters.	Not successful, further modifications required	N/A	Cost Covered by O&M.	Jan-03	Mar-03	JEA WTS 15-09	Relief Valves, HP Feedwater Heaters
89	Insufficient operating flexibility for the fly ash handling system.	Fly Ash Handling	Reprogram PLC for additional flexibility in selection or de-selection of specific hoppers. Also configure programming to allow control of individual components.	Greater operating flexibility.	Successful	12.3		Jan-03	Mar-03	JEA WTS 07-04	Fly Ash Handling
90	Frequent hang-up of fly ash crossover valves.	Fly Ash Handling	Install instrument air regulator and purge air to all fly ash crossover valve seats and bonnets. Disassemble and thoroughly clean all valve seating areas and bonnets.	Minimize valve hang-ups.	Substantially successful	28.0		Jan-03	Feb-03	JEA WTS 14-01	Fly Ash, Valves
91	Fly ash gate valves require excessive maintenance.	Fly Ash Handling	Rebuild/replace fly ash gate valves.	Reduced valve maintenance.	Substantially successful	74.1		Jan-03	Apr-03	JEA WTS 14-09	Fly Ash, Valves
94	Improper fuel sizing of coal and pet coke	Fuel Crushers	Completely removed four of six rows of hammers from Crusher B and Crusher A, and removed every other hammer from the other two rows.	Provide proper fuel sizing to the boiler.	Not successful, further modifications required	N/A	See Note 1.	Feb-02	Apr-02	FW-033	Crusher
95	Fuel leaks and dust emissions from fuel feed and drop chute isolation gate bonnets	Fuel Feed	Install purge air from cold PA to bonnets of front and rear wall fuel feed isolation gates and rear wall drop chute gates.	Reduce leakage and dust emissions.	Successful	19.6		Jan-03	Apr-03	JEA WTS 10-02	Fuel Feed, Gates
96	Rear wall drag chain drop gates non-functional	Fuel Feed	Replace rear wall drop chute dual blade gate with an actuated single blade gate.	Improve operation of gates	Successful	222.6		Jan-03	Apr-03	JEA WTS 10-03	Fuel Feed, Gates
98	Fuel leakage between front wall fuel feed chute and combustor wall box	Fuel Feed	Fuel Feed Chute Seal Welding	Stop leakage	Generally Successful	18.0		Feb-03	Apr-03	JEA WTS 10-05	Feed Chute

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99	Miscellaneous hindrances to optimum operation of the fuel handling system.	Fuel Handling	Numerous modifications as described in the April 2002 and the August 2002 NSRP Start-up Update Reports in Appendix 2.	Optimize system performance.	Generally Successful	N/A	See Note 1.	Feb-02	Apr-02	JEA-003	Fuel Handling
100	Numerous pluggages have occurred in the lower cone of the fuel silos.	Fuel Silos	Install hammer blocks on fuel silos to prevent hammer damage to the silos during flow stoppages. Install rappers on fuel silos to prevent flow stoppages.	Minimize pluggages, and facilitate removing pluggages when they do occur.	Successful	67.0		Jan-03	Apr-03	JEA WTS 04-04 and 04.05	Fuel Silos
101	High bed levels (30 to 35 inches) over several days, resulting in excessive solids circulation and a number of bed excursions, including back-up of bed material into the bottom of the cyclones.	Furnace	Imposed operation limitations to keep bed level between 15 and 20 inches. Minimized rapid load changes. Improved stripper cooler emergency spray nozzle performance by increasing air purge time and improving atomization.	Keep bed levels with acceptable ranges.	Improved control	N/A	See Note 1.	07-Jul-02	Jul-02	FW-044	Furnace
102	The installed spare seal pot blower and INTREX blower are operated continuously.	Furnace, Blowers	Study conducted to evaluate need for additional seal pot and/or INTREX blowers. Evaluate internal modifications within INTREX cells and bypass channels (possible seal pot bypass). Future modification will include additional blower	Achieve adequate seal pot and INTREX blower flow rates without operating the installed spare blowers.	In progress	177.0		Jan-03	Feb-03	JEA WTS 08-04	Seal Pot Blowers, INTREX Blowers
103	Furnace bed temperatures during operation were lower than the design range.	Furnace, Division Walls	Approximately 50% of the furnace division walls were removed, which was equivalent to approximately 10% of the boiler's evaporative heating surface.	Decrease the heat exchange in this section of the boiler, resulting in an increase in the furnace bed temperature, which is needed for satisfactory combustion of pet coke.	Not successful, further modifications required	N/A	See Note 1.	Mar-02	Apr-02	FW-036	Furnace, Division Walls
105	Excessive vibration of seal pot blowers.	Furnace, Seal Pot Blowers	Modify seal pot blower bases and skids to include grouting. To provide a more vibration resistant and stiffer base.	Reduce vibration of seal pot blowers.	Successful	440.8		Jan-03	Dec-03	JEA PWO 5359641	Seal Pot Blowers, Vibration
106	Furnace expansion tube failures.	Furnace, Tubes	Modify division wall plate seals	Minimize furnace expansion tube failures.	Successful	N/A	Cost Covered by O&M.	Jan-03	Apr-03	JEA WTS 15-08	Furnace Expansion Tubes

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107	Critical safety punch list items were not completed before FW left the site.	FW Scope, Punch List	Unit 2 has been scoped but not recently updated. This item covers only most critical safety deficiencies for Unit 2.	Safe operation and maintenance of the unit.	Successful	161.3		Jan-03	Mar-03	JEA WTS 17-05	Punch List
108	Gas build-up in Unit 2 Generator Step-up Transformer TG2	Generator Step-up Transformer TG2	Alarms for "Gas Detected", "High Winding Temperature", and "High Oil Temperature" were hard wired to the DCS, and automatic unit trips were programmed into the DCS on "Gas Detected".	Provide highly reliable alarms to automatically protect the transformer from catastrophic failure.	Transformer is still in service.	N/A	Letter BV/JEA - 0417. ECN E-062. See Note 1.	26-Jan-02	Aug-02	BV-013	TG2, Generator Step-up Transformer
109	Potential failure of Unit 2 Generator Step-up Transformer TG2 due to gas build-up.	Generator Step-up Transformer TG2	A spare used transformer was purchased by JEA, for installation in the event TG2 failed, or needed to be returned to the manufacturer for repairs.	Have the ability to quickly replace the Generator Step-up Transformer in the event of failure.	Transformer is still in service.	N/A	Letter BV/JEA - 0417. WP K-086. See Note 1.	26-Jan-02	Apr-02	JEA-002	TG2, Generator Step-up Transformer
110	Initially, operation of the boiler was limited to 50% to 60% load due to thermal growth issues of the feedwater piping and cold reheat piping. Horizontal guides and supports on the pipe rack were on the verge of becoming completely misaligned.	High Energy Piping	Supports were modified to accommodate the actual thermal growth and movements being experienced.	Properly support the piping under all operating conditions.	Not successful, further modifications required	N/A	See Note 1.	Feb-02	Mar-02	FW-031	Piping, Supports
111	High energy critical piping (MS, HRH, CRH, and feedwater) on the pipe rack to the turbine building has moved off of its supports in many places. Also, HRH and CRH flange leaks have developed.	High Energy Piping	Perform engineering study of high energy critical piping movements to evaluate hot and cold reheat flange leaks and high energy pipe movement. Recommend modifications.	Identify modifications to properly guide and support piping, and eliminate flange leaks.	Partial success, final modifications continuing	50.0		Jan-03	Feb-03	JEA WTS 15-03	High Energy Piping
112	High energy critical piping (MS, HRH, CRH, and feedwater) on the pipe rack to the turbine building has moved off of its supports in many places. Also, HRH and CRH flange leaks have developed.	High Energy Piping	Modifications to Unit 2 restraints and supports on the pipe rack.	Properly guide and support piping, and eliminate flange leaks.	Partial success, final modifications continuing	585.3		Jan-03	Mar-03	JEA WTS 15-04	High Energy Piping

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113	High ambient temperatures in the Electrical Equipment Room in the Ash Blower Building were causing failures of Variable Frequency Drive (VFD) electronic devices and shutdowns of the Ash Processing System from the ash silos.	HVAC, Ash Blower Building	Many of the VFD cabinets were added in this electrical equipment room late in the design process, which resulted in the originally designed HVAC system being undersized. An additional air conditioning system was installed for this room.	Reduce ambient temperatures in the electrical equipment room to acceptable levels.	Successful	N/A	WP S-031. See Note 1.	May-02	Jun-02	BV-024	HVAC, Ash Blower Electrical Equipment Room.
114	Environment for the GE EX 2000 Exciter cabinets does not meet GE recommendations	HVAC, Exciter Cabinets	Evaluate the need for an enclosure and HVAC for the GE EX 2000 exciter cabinets.	Comply with GE recommended environment.	Successful to date	61.4		Jan-03	Apr-03	JEA WTS 05-05	Exciter
115	Dust and condensation in the switchgear room.	HVAC, Limestone Preparation	Install wall unit air conditioners provided from plant surplus.	Improved environment for electrical equipment.	Successful	15.5		Jan-03	Apr-03	JEA WTS 03-12	HVAC
117	ID Fan lube oil systems were contaminated with foreign material and water in oil, and leakage of bearing cooling water into oil due to improper installation of cooling water piping	ID Fans	Modification of cooling water piping, and repeated flushes of the lube oil systems.	Clean lube oil system.	Successful	N/A	See Note 1.	Aug-01	Dec-01	FW-014	ID Fans, Lube Oil
118	Problems with ID fan vibration monitors included non-armored cables installed in tray (instead of conduit), several modifications were required to mounting brackets, and inadequate shaft grooves.	ID Fans	Vibration cable was reinstalled, and mounting brackets were modified.	Reliable operation of the vibration monitoring system.	Successful	N/A	See Note 1.	Aug-01	Dec-01	FW-017	ID Fans, Vibration Monitoring
119	Bleed down of fabric filter air receiver on loss of instrument air supply.	Instrument Air	Install check valves and additional receiver in instrument air supply lines to fabric filter instrument air receivers to prevent receiver bleed down on loss of instrument air supply.	Keep fabric filter instrument air supply available longer on loss of instrument air supply.	Successful	12.8		Jan-03	Apr-03	JEA WTS 07-21	Instrument Air, Check Valves
120	Pressure transmitters and pressure switches for tripping the ID fans on high negative pressures were located on the upper portion of the boiler combustor, and did not provide adequate protection of the AQCS housings and ductwork from high negative pressures.	Instrumentation, AQCS	Two pressure switches were added at the ID fan inlet ducts, to provide a two out of three ID fan trip on high negative pressure in the ID fan inlet duct.	Better protection of the AQCS and ductwork from high negative pressures.	Successful	N/A	FW Letter 2.1-1077. See Note 1.	Mar-02	May-02	FW-034	Flue Gas, Pressure Instrumentation

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123	Steam drum level transmitters were not located properly.	Instrumentation, Boiler Drum	Level transmitters were relocated for proper function and better access.	Proper operation of the level transmitters.	Successful	N/A	See Note 1.	Aug-01	Dec-01	FW-018	Drum, Level Transmitters
124	The electronic heads for three of the new level transmitters for feedwater heaters were getting very hot, which could result in premature failure of the level transmitter.	Instrumentation, Level Transmitters	Installation of heat insulators between the level transmitter housing and the electronic head of the transmitter.	Longer life of level transmitters.	Successful	N/A	WP K-081. See Note 1.	May-02	Sep-02	BV-026	Level Transmitter
125	Several pressure indicators could not indicate the actual operating pressures being encountered.	Instrumentation, Pressure Indicators.	Replace pressure indicators with compound type pressure indicators, or higher range pressure indicators..	Provide accurate local indication of system pressures.	Successful	N/A	WP K-041, WP K-042. See Note 1.	Oct-01	Dec-01	BV-003	Pressure Indicators
126	Type K, J, and E thermocouples were installed at various locations, with wrong type of wire pulled to the T/C's in many cases.	Instrumentation, Thermocouples	Thermocouples were replaced to match the wire type installed, or the wire was replaced.	Proper operation of the thermocouples.	Successful	N/A	See Note 1.	Aug-01	Aug-01	FW-020	Thermocouples
127	Turbine exhaust pressure from four basket tip connection in the exhaust hood were originally intended to be connected to temporary test instruments during turbine tests.	Instrumentation, Turbine Exhaust Pressure	Permanent pressure transmitters were installed and outputs wired to the DCS to facilitate on-line monitoring of turbine performance.	Improved on-line monitoring of turbine performance.	Successful	N/A	WP K-056. See Note 1.	Jan-02	Apr-02	BV-011	Turbine Exhaust, Pressure Transmitters
129	After a unit trip in early March, and subsequent attempts to minimize backsifting from the INTREX, large amounts of ash in the C cyclone suddenly flushed through the INTREX to the furnace, causing damage and distortion to the INTREX weir wall.	INTREX	The thickness of the weir walls in each INTREX was doubled, and two additional lateral support arches and an additional horizontal buckstay were installed in each INTREX	Prevent future internal distortion and damage to the INTREXes.	Partial success, further modifications required	N/A	See Note 1.	Mar-02	Mar-02	FW-035	INTREX, Weir wall

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130	Backsifting of bed material from the INTREXes after a boiler trip.	INTREX	The source of fluidizing air to the INTREX return zones was moved from primary air to the INTREX fluidizing air blower discharge. Also, the boiler control logic was changed to keep the INTREX and seal pot blowers operating after a boiler trip. Also, the associated fluidizing air standpipes in the vicinity if the back sifting were lengthened and modified to help prevent backsifting.	Reduce backsifting.	Not successful, further modifications required	N/A	See Note 1.	07-Mar-02	Mar-02	FW-037	INTREX, Fluidizing Air
131	Inadequate control of bed ash flow through the INTREX	INTREX	The height of the bypass weir wall in each INTREX was lowered by 18 inches. The height of the bypass weir walls in Unit 1 INTREXes were reduced by 30 inches in order to evaluate the optimum bypass weir wall height.	Better control of ash through the INTREX superheating sections by providing greater flexibility in the amount of ash bypassing the heat transfer sections. This should result in better superheat steam temperature control, and aid in increasing furnace bed temperature.	Partial success, further modifications required	N/A	See Note 1.	Apr-02	Apr-02	FW-041	INTREX, Bypass Weir Wall
132	Back-up of bed material from the INTREX into the bottom of the C cyclone due to a reduction of fluidizing air flow through the associated INTREX.	INTREX	Additional fluidizing air ports were installed on the cyclone outlet, air source for supply to the INTREX superheater entrance area was changed to a higher pressure source, the air source for the supply to the INTREX return channel and duct was changed, and additional rod out ports were installed.	Eliminate back-up of ash material into the cyclones	Minimal success, further modifications required	N/A	See Note 1.	31-May-02	Jun-02	FW-043	INTREX, Cyclone
133	Continuing INTREX operating problems and deficiencies	INTREX	INTREX air and solids flow model study	Identify means to improve INTREX operation and performance.	In progress	134.4		Feb-03	Mar-03	JEA WTS 08-05	INTREX
134	Misalignment of superheater bundles in INTREX	INTREX, Tubes	Alignment clips (handcuffs) were modified.	Maintain proper alignment of tube bundles during operation, and reduce damage to tube bundles..	Successful	267.1	Cost is JEA cost under JEA WTS 08-06. For FW cost, see Note 1.	Aug-01	8/1/2001 and 4/1/2003	FW-025 and JEA WTS 08-06	INTREX, Tube Bundle

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135	INTREX Cell Superheater Tube Bundle Supports shelf failure	INTREX, Tubes	Re-design and replace shelf	Eliminate failures	Successful	48.2		Jan-03	Apr-03	JEA WTS 08-07	Superheater
136	INTREX superheater tube failures.	INTREX, Tubes	INTREX superheater tube failures metalurgical analysis. Study may show requirements for modifications.	Minimize superheater tube failures.	In progress	N/A	Cost Covered by O&M.	Jan-03	Mar-03	JEA WTS 15-07	Superheater, Tubes
138	Limestone feed system from the limestone silo to the boiler was not reliable.	Limestone Feed	Changed pipe routing, pipe size, and pipe material. Vent system was modified extensively to eliminate pluggage.	Reliable feed of limestone from the limestone silo to the boiler.	Vent system modifications were not successful	N/A	See Note 1.	Aug-01	Aug-01	FW-022	Limestone Feed
139	No cleanout provisions above the limestone feed rotary valves.	Limestone Feed	Install 8" clean-out port above limestone feed rotary valves. Install air taps below limestone silo isolation gates to facilitate closing gate.	Facilitate cleanout of pluggages in the limestone feed rotary valves.	Successful	N/A	Included in Item 142.	Jan-03	Apr-03	JEA WTS 01-03	Rotary Valves
140	Original bag-catcher in limestone bin vents failed.	Limestone Feed	Remove remains of existing bag catcher for limestone silo bin vent. Engineer & install replacement bag catcher for limestone silo bin vent.	Prevent broken bags from bin vent filters from obstruction the limestone feed system to the boiler.	Successful	6.7		Jan-03	Apr-03	JEA WTS 01-04 and 01-05	Bin Vent Filter, Filter Bags
142	Pluggage of vent piping from the limestone vent hoppers to the bin vent filters, due to internal condensation and build-up of limestone dust.	Limestone Feed	Modification of vent piping from vent hoppers to bin vents, including addition of hot primary air to prevent system from operating below saturation & condensing moisture which causes agglomeration of limestone dust & pluggage. Install additional instruments for limestone feed vent system.	Eliminate pluggage of vent piping	Partial success, further modifications required	36.5		Feb-03	Apr-03	JEA WTS 01-01 and 01-09	Limestone, Vent Piping
143	Condensation in limestone vent piping and in bin vent filters.	Limestone Feed	Insulate vent riser piping and bin vents and hot PA piping to maintain temperature and prevent pluggage due to condensation and for personnel protection. Insulate limestone day bin.	Prevent internal condensation in bin vent filters, day bin, and in vent piping.	Successful	64.2		Feb-03	Apr-03	JEA WTS 01-02 and 02-10	Insulation
144	Packing for limestone feed rotary valves fails quickly, resulting in leaks and dust emissions.	Limestone Feed Rotary Valves	Modify rotary valve packing to increase packing life, decrease dust emissions and reduce torque.	Lengthen packing life	Successful	176.6		Jan-03	Apr-03	JEA WTS 01-07	Rotary Valves

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145	Premature failures of limestone feed rotary valve gearboxes and motors	Limestone Feed Rotary Valves	Replace rotary valve gearboxes with upgraded higher horsepower components.	Lengthen gearbox and motor life.	Successful	39.6		Jan-03	Apr-03	JEA WTS 01-08	Rotary Valves
146	Excessive bag wear in the limestone preparation dust collectors.	Limestone Preparation	Modify baghouse to diffuse inlet air stream to reduce local high velocities and associated bag wear. Evaluate capacity of baghouse and determine whether further modifications are required.	Lengthen bag life.	Partially successful, efforts continuing	33.5		Jan-03	Apr-03	JEA WTS 03-03	Dust Collector, Bags
147	Operation of the Limestone Preparation System optimization.	Limestone Preparation	Research and development of modifications to limestone prep process to improve product size distribution, production rate and product drying. This is an R&D effort to arrive at a limestone product that is best suited to the boiler operating characteristics.	Provide a limestone product that is best suited to the boiler operating characteristics.	Not successful	23.2		Jan-03	Feb-03	JEA WTS 03-09	Limestone Preparation
148	Cracking in limestone dryer/rod mills, and liner & bolt failure problems.	Limestone Preparation	Evaluate long term reliability and suitability of rod mill crushing system and make short term repairs as required to reliably produce a dry product with proper size distribution.	Improve durability and reliability of the limestone dryer/rod mills.	Liner bolt replacement successful	22.0		Jan-03	Apr-03	JEA WTS 03-10	Limestone Dryer/Rod Mills
149	Chute work pluggage problems to limestone screeners.	Limestone Preparation	Modify chute work to reduce pluggages and improve flow distribution to screeners. Modifications include installation of UHMW or stainless steel liners.	Eliminate chute work pluggages.	Successful	64.7		Jan-03	Apr-03	JEA WTS 03-11	Limestone, Chute work
150	Limestone preparation air compressors & blowers are not separated in a separate enclosure	Limestone Preparation	Piped air inlets to exterior of building	Reduce inlet filter pluggage	Successful	30.4		Jan-03	Apr-03	JEA WTS 03-13	Enclosure
152	Excessive bag temperature at the limestone preparation dust collectors.	Limestone Preparation	Install TC's at baghouse inlet and terminate on PLC to protect and control bag temperatures. Overtemperatures on bags is causing premature failures.	Protect bags from over-temperature.	Partial implementation successful	7.6		Jan-03	Apr-03	JEA WTS 03-18	Dust Collector, Bags
153	Limestone transport system capacity to Unit 1 is inadequate	Limestone Transport	Flow modeling study of limestone transport system by J&J, recommendation to include blower sizing and pipe sizing modifications.	Determine system design changes to increase capacity of the limestone transport system.	Successful	4.3		Jan-03	Feb-03	JEA WTS 02-03	Limestone Transport

Significant modifications which were required as a result of Unit 2 start-up and testing activities

Record ID	Description of Problem	Particular Process or Item of Equipment	Description of Modification Implemented	Intended Impact of Modification	Evaluation of Results of Modifications	Cost of Mods (000's)	Remarks/Cost Notes	Date Encountered (Approx.)	Date Implemented (Approx.)	Mod. No.	Keywords
154	Limestone transport system capacity to Unit 1 is inadequate	Limestone Transport	Replace limestone transport piping as required. Replace complete transport blower skids with upgraded skids.	Increase capacity of the limestone transport system.	Successful	2,003.5		Jan-03	Apr-03	JEA WTS 02-01 and 02-02	Limestone Transport
155	PA Booster Blowers for the start-up burners experience motor bearing problems and overheating of fan bearings during normal operation, when blowers were not in service.	PA Booster Blowers	Motor bearings were replaced. Fan shaft seals were modified to reduce fan bearing temperature, High temperature grease was installed in the bearings.	Reliable operation of the PA Booster Blowers	Partially Successful	N/A	See Note 1.	Aug-01	Aug-01	FW-007	PA Booster Blowers
156	PA booster blower bearings and shafts are not reliable.	PA Booster Blowers	Upgrade bearings and seals. Added but did not complete forced lube system	Improve reliability of PA Booster Blowers.	Generally Successful	145.7		Jan-03	Mar-03	JEA WTS 11-03	PA Booster Blowers, Bearings
158	No visual indication of lube oil flow to the PA fan bearings.	PA Fans	Sight flow indicators were installed in the forced flow lube oil lines to the fan bearings.	Provide a means to verify that lube oil is flowing to the fan bearings.	Successful	N/A	See Note 1.	Aug-01	Aug-01	FW-016	PA Fans, Lube Oil
159	Operating experience at the FW CFB at Bayshore indicated inadequate control of PA flow in the plenum windbox under the furnace.	PA Plenum Windbox	The PA plenum windbox was compartmentalized into three sections, so that the plenum inlet dampers could be used to control PA flow to each compartment.	Improved primary air flow distribution into bottom of furnace.	Generally Successful	N/A	Conference Memorandum CM-33. No additional cost to JEA.	17-Jul-01	Aug-01	FW-001	PA, Plenum, Windboxes
160	Back sifting of ash into the PA inlet plenum may occur during low load operation.	PA Plenum Windbox	An ash drain was installed in each corner of each windbox compartment, with PA windbox air to lift any back sifted ash and return it to the SA openings. Air diffuser plates were strengthened. Ceramic coating was applied in windboxes.	Allow backsifted ash to be removed from the windbox compartments while the unit remained in service.	Not successful, further modifications required	N/A	Conference Memorandum CM-33. No additional cost to JEA.	17-Jul-01	Aug-01	FW-003	Ash Drains

Significant modifications which were required as a result of Unit 2 start-up and testing activities

Record ID	Description of Problem	Particular Process or Item of Equipment	Description of Modification Implemented	Intended Impact of Modification	Evaluation of Results of Modifications	Cost of Mods (000's)	Remarks/Cost Notes	Date Encountered (Approx.)	Date Implemented (Approx.)	Mod. No.	Keywords
161	The sides of the refractory filled floor box pulled away from the membrane floor at the "C" burner, allowing flue gas and sand to escape. The metallic expansion joints at the primary air to grid inlet plenum (furnace bottom) were also damaged.	PA Plenum Windbox, Expansion Joints	The plenum floor boxes and refractory were replaced and the plenum floor boxes were stiffened in each corner. The upper and lower convolutions of the expansion joints were inspected for damage, and guide or control rods were installed at the metallic expansion joints to allow compression. The expansion joints were also aligned with movement of the furnace, to minimize primary air duct and plenum distortion. Ceramic fiber blankets and fabric belts were used to temporarily enclose and reinforce the convolutions of the metallic expansion joints.	Prevent future plenum box, refractory, and expansion joint failures	Successful	N/A	FW Letter 2.1-1053. See Note 1.	27-Jan-02	Feb-02	FW-028	Expansion Joint
162	During initial operation of the Unit 2 River Water System, the FRP piping was moving excessively.	Piping, River Water	Restraint and guide type pipe supports and modifications were added	Reduce pipe movement to acceptable levels.	Successful	N/A	WP M-117. See Note 1.	Nov-01	Nov-01	BV-005	River Water, Pipe Supports
163	Failure of refractory shielding at INTREX inlet and outlet expansion joints.	Refractory, INTREX Expansion Joints	Remove refractory and expansion joint inner liner. Replace pillows, seal and liner. Replace with upgraded anchors and reinstall refractory.	Prevent future refractory failures.	Successful	844.7		Jan-03	Feb-03	JEA WTS 12-10	Refractory, INTREX
167	The excess flow control valve in the service air supply from the common plant compressed air system to the CFB Boilers was closing under normal operating conditions.	Service Air	The originally specified excess flow control valve, which was improperly specified, was replaced with a larger control valve, with a manual bypass valve around it.	Allow the design service air flow rate to the CFB Boilers.	Successful.	N/A	WP M-160. See Note 1.	Feb-02	May-02	BV-017	Service Air
168	Boiler and AQCS service air consumption (Units 1 and 2) significantly exceeds the amount predicted during design. Additional service air consumption resulted from FW modifications for continuous cooling of the stripper cooler spray nozzles, and for pressurizing the stripper cooler expansion joints.	Service Air	Reduce service air flows through throttling valves	Reduce system demand	Not successful. Roots blowers installed per JEA WTS 13-02.	N/A	FW Letter 2.1-1083. See Note 1.	Feb-02	Feb-02	JEA-004	Service Air

Significant modifications which were required as a result of Unit 2 start-up and testing activities

Record ID	Description of Problem	Particular Process or Item of Equipment	Description of Modification Implemented	Intended Impact of Modification	Evaluation of Results of Modifications	Cost of Mods (000's)	Remarks/Cost Notes	Date Encountered (Approx.)	Date Implemented (Approx.)	Mod. No.	Keywords
169	Excessive service air usage for purge air to emergency spray water nozzles in stripper coolers.	Service Air, Stripper Coolers	Design procure and Install purge air header and Roots blower for stripper cooler spray water nozzle continuous cooling and purge air.	Reduce service air usage.	Successful	111.5		Jan-03	Apr-03	JEA WTS 13-02	Stripper Coolers, Purge Air
170	Start-up burners experienced refractory failures, localized overheating, and excessive vibration during operation. The gas spuds in the start-up burners were misaligned	Start-up Burners	Burner barrel refractory was partially replaced or modified, diffuser and mounting pipes were replaced, gas spuds were re-aligned, fuel piping and instruments damaged by vibration were replaced, and burner operation was modified to reduce vibration.	More reliable operation of the start-up burners.	Successful	N/A	See Note 1.	Aug-01	Aug-01	FW-004	Start-up Burners
172	Burner vibration during operation. Burner operation with excess air.	Start-up Burners	Engineering evaluation of burner operation including vibration to identify design modifications to eliminate vibration. Study also includes modification of air flow to burner to prevent operation with excess air. Study to be performed by Peabody.	Reduce burner vibration to acceptable levels.	Successful	0.6		Jan-03	Feb-03	JEA WTS 11-01	Start-up Burners, Vibration
173	Movement of refractory brick in burner barrels, resulting in damage to barrel steel.	Start-up Burners	Repair refractory system (tile) in burner throats. Replace carburized barrel steel on Unit 2 burners (A & C). This problem has been caused by operational practices.	Prevent premature refractory failures.	Successful	N/A	See FW Letter 2.1-1083, Pg 3, Item 6. Cost Covered by O&M	Jan-03	Apr-03	JEA WTS 11-04	Start-up Burners, Refractory
174	Start-up burner controls and scanners are not reliable.	Start-up Burners	Upgrade burner flame scanner system and pressure switch, low fire pressure switch, and position switches to improve burner reliability. Upgrade gas flow meters.	Improve burner reliability.	Successful	22.0		Jan-03	Apr-03	JEA WTS 11-05	Start-up Burner, Controls
175	Start-up burner gas flow measurement not adequate and burner operating practices were non-uniform	Start-up Burners	Additional Startup Burner Instrumentation to facilitate improved operation of burner air and gas flows	Improve burner reliability and operation	Generally successful, further equipment modifications required	54.0		Feb-03	Feb-03	JEA WTS 11-06	Start-up Burner, Controls

Significant modifications which were required as a result of Unit 2 start-up and testing activities

Record ID	Description of Problem	Particular Process or Item of Equipment	Description of Modification Implemented	Intended Impact of Modification	Evaluation of Results of Modifications	Cost of Mods (000's)	Remarks/Cost Notes	Date Encountered (Approx.)	Date Implemented (Approx.)	Mod. No.	Keywords
176	Natural gas header pressure switches had incorrect set points, gas meters had incorrect readouts, and natural gas header relief valve discharges were not piped to a safe area.	Start-up Burners, Gas Supply	Pressure switches were replaced, gas meters were replaced, control methodology was changed, and relief valve discharges were piped to a safe area.	More reliable operation of the start-up burners.	Partial success, additional modifications required	N/A	See Note 1.	Aug-01	Aug-01	FW-006	Natural Gas
177	Operating feedback from other FW projects indicated ash movement through the stripper coolers could be impeded under certain operating conditions.	Stripper Coolers	Installation of dedicated plenums with air assist nozzles at ash turning points in the stripper coolers and at the ash drains from the furnace. Normal air supply was provided from the hot PA from the air heater outlet, with a backup source from service air.	Improved ash movement through the stripper coolers.	Minimal success, air source to compartments 1 and 2 changed to cold PA in July 2002.	N/A	Conference Memorandum CM-33. No additional cost to JEA.	17-Jul-01	Aug-01	FW-002	Stripper Coolers, Fluidizing
178	High bed levels (30 to 35 inches) over several days, resulting in excessive solids circulation and a number of bed excursions, including back-up of bed material into the bottom of the cyclones.	Stripper Coolers	Changed the source of the fluidizing air supply to compartments 1 and 2 of the stripper coolers from the hot primary duct to the cold primary duct.	Improve stripper cooler performance, and reduce the amount of fines returned to the furnace.	Minimal success	N/A	See Note 1.	07-Jul-02	Jul-02	FW-045	Stripper Coolers, Fluidizing
179	Inadequate performance of stripper coolers.	Stripper Coolers	Baffle wall modifications of the passage between cell walls - increase size vertically.	Improve performance of stripper coolers.	Minimal success	58.7		Jan-03	Apr-03	JEA WTS 13-03	Stripper Coolers
180	Ash pluggages at stripper coolers.	Stripper Coolers	Add air taps and connect plant air to 3/4" valve below stripper cooler rotary valve isolation gate. Add cold PA purge air to isolation gate bonnet.	Facilitate on-line break-up of ash pluggages.	Partial success, further modifications required	7.2		Jan-03	Apr-03	JEA WTS 13-04	Stripper Coolers
182	Ash pluggages at stripper cooler outlets.	Stripper Coolers	Lower stripper cooler outlet rotary valves and modify droplegs between stripper cooler outlets and rotary valves for installation of cleanout ports, fluidizing air taps, and connections for future air cannons.	Facilitate on-line break-up of ash pluggages.	Successful	5.9		Jan-03	Apr-03	JEA WTS 13-09	Stripper Coolers
183	Insufficient heat removal in cooler sections of stripper coolers	Stripper Coolers	Complete Installation of cold PA piping to stripper coolers includes addition of isolation valves to new piping and to existing cold PA to stripper cooler piping.	Increased heat removal	Partially successful	17.6		Jan-03	Apr-03	JEA WTS 13-10	Stripper Coolers

Significant modifications which were required as a result of Unit 2 start-up and testing activities

Record ID	Description of Problem	Particular Process or Item of Equipment	Description of Modification Implemented	Intended Impact of Modification	Evaluation of Results of Modifications	Cost of Mods (000's)	Remarks/Cost Notes	Date Encountered (Approx.)	Date Implemented (Approx.)	Mod. No.	Keywords
184	Frequent pluggage of stripper coolers.	Stripper Coolers	Install ports for online clearing of stripper cooler ash pluggages.	Facilitate on-line clearing of ash pluggages in stripper coolers.	Successful	101.0		Jan-03	May-03	JEA WTS 13-11	Stripper Coolers
185	Failure of rotary valve motor gearboxes at stripper coolers.	Stripper Coolers, Rotary Valves	Install upgraded gearboxes and motors (to 7.5 hp) with chain tension adjustability. Drive will have to be changed out also. VFD's, gearbox, motor all located in local panel.	Improve reliability of rotary valves.	Successful	25.7		Jan-03	Apr-03	JEA WTS 13-05	Stripper coolers, Rotary Valves
186	Excessive amounts of ash and lime slurry were being drained to Sump 12, resulting in buildup of ash behind the weir wall.	Sump 12	Installation of flushing system from the reuse water system, that would agitate the area behind the weir whenever the sump pumps in Sump 12 started.	Agitate built-up ash behind the weir wall so it would be pumped out, to the CWTS.	Not successful. The flush pipes became plugged with ash also.	N/A	WP M-132, WP K-054, WP M-183. See Note 1.	Jan-02	Feb-02	BV-007	Sump 12, Flushing
187	Fabric Filter sumps experiencing build up of solids	Sumps, AQCS	Add agitation and pumps designed for a slurry environment	Improved operation of sump.	Successful	65.0		Jan-03	Apr-03	JEA WTS 07-23	Sump, Pumps
188	Failure of two of the nine feeder cables for Unit 1 and 2 Start-up Transformer T-21. Cables were approximately 30 years old.	Transformer T-21	Replacement of all nine feeder cables (failed cables were replaced immediately with temporary cables on an emergency basis).	Prevent future T-21 cable failures.	Successful	N/A	See Note 1.	Apr-02	Oct-02	JEA-007	Transformer, T-21
189	Actuation of protective relay for Transformer T-31 when the 138 kV yard experienced a disturbance.	Transformer T-31	Grounding of the neutral CT at Transformer T-31 was corrected by JEA.	Reliable operation of Transformer T-31.	Successful	N/A	Letter BV/JEA - 0417. See Note 1.	25-Jun-02	Jul-02	JEA-008	Transformer T-31
190	HP/IP bypass valve hydraulic unit has become contaminated.	Turbine Bypass Valve, HP/IP	Perform actuator hydraulic system flush for HP/IP bypass valve. Includes hydraulics-capable CCI rep to develop PM and maintenance program.	Reliable operation of the HP/IP bypass valve.	Successful	13.9		Jan-03	Apr-03	JEA WTS 15-10	HP/IP Bypass Valve
191	Only a single pressure transmitter for turbine first stage pressure was provided by GE.	Turbine, First Stage Pressure	Since turbine first stage pressure is a critical control parameter for the unit, two addition pressure transmitters were installed, and the control system was changed to a 2 out of 3 scheme.	More reliable control of the unit, and allow for on-line maintenance of the pressure transmitters (one at a time).	Successful	N/A	WP-169, WP K-072. See Note 1.	Mar-02	May-02	BV-020	Turbine, First Stage Pressure
192	The steam turbine trip contact in the GE Mark VI was not rated for use with trip and close coils, which impaired the operation of the fast transfer of auxiliary electric loads after a turbine trip.	Turbine, Mark VI	Install an auxiliary relay to activate the trip and close coils	Proper operation of the fast transfer of auxiliary electric loads.	Successful	N/A	WP K-062. See Note 1.	Feb-02	Mar-02	BV-018	Turbine, Fast Transfer

Significant modifications which were required as a result of Unit 2 start-up and testing activities

Record ID	Description of Problem	Particular Process or Item of Equipment	Description of Modification Implemented	Intended Impact of Modification	Evaluation of Results of Modifications	Cost of Mods (000's)	Remarks/Cost Notes	Date Encountered (Approx.)	Date Implemented (Approx.)	Mod. No.	Keywords
193	Redundant software and hard wired trip signals from the GE Mark VI to the DCS resulted in a false turbine trip signal in the DCS, in the event of a failure of the data highway between the Mark VI and the DCS.	Turbine, Mark VI	The Mark VI software turbine trip signal was hard wired to the DCS, resulting in two redundant hard wired turbine trip signal paths from the Mark VI to the DCS.	Eliminate false turbine trip signals to the DCS.	Successful	N/A	Letter BV/JEA - 0417. WP K-083. See Note 1.	25-Jun-02	Aug-02	BV-029	Turbine, Trip, Mark VI, DCS
194	Soft turbine trips have been initiated when not necessary.	Turbine, Mark VI	Changing majority of soft turbine trips to hard wired turbine trips.	Eliminate soft trips in favor of hard wired trips.	Successful	N/A	Cost Covered by O&M.	Jan-03	Feb-03	JEA WTS 05-07	DCS
195	Premature failure of disk spring actuator on reheat stop valve.	Turbine, Reheat Stop Valves	Premature failure of disk spring actuator necessitates replacement of all reheat stop valve disk paks.	Eliminate future failures.	Successful	N/A	See Note 1.	Nov-02	Nov-02	JEA WTS 15-11	Turbine, Reheat Stop Valves
196	The turbine DC Seal Oil Pump and DC Lube Oil Pump were provided with local start/stop/auto switches which, if left in the incorrect position or mis-operated, could result in major turbine damage.	Turbine, Seal Oil / Lube Oil	Remove the local start/stop/auto switches, but leave the local indicating lights.	Insure that only the control room operator controlled the functionality of these pumps.	Successful	N/A	WP K-058. See Note 1.	Jan-02	Apr-02	BV-012	Turbine, Lube Oil, Seal Oil

Note 1: Cost is included in overall Project cost, but is not separately identifiable.

Total Cost of Modifications (000's) **$9,076.1**

APPENDIX 4

PROJECT MILESTONE SCHEDULE

The Project Milestone Schedule on the following pages lists the significant milestone dates associated with the Repowering Project. Milestone dates are indicated for Unit 2 and Common Facilities, and also for Unit 1, since the Unit 1 project activities were implemented with only a planned three month lag behind Unit 2 and Common Facilities.

	MILESTONE	Aug-99 Original Baseline	Feb-00 Updated Baseline	Sep-01 Updated Baseline	Jul-02 Approved DOE Schedule	Actual / Forecast Completion
	JEA Large-Scale CFB Combustion Demonstration Project Cooperative Agreement Signed	27-Sep-97	27-Sep-97	27-Sep-97	27-Sep-97	27-Sep-97
DOE PHASE 1						
1.1	***PROJECT MANAGEMENT***					
	Project Management Plan	30-Sep-99	7-May-99	7-May-99	7-May-99	7-May-99
	Public Design Report	Not Sched	Not Sched	Not Sched	6-Nov-02	20-Oct-03
	Environmental Monitoring Plan	2-Dec-99	2-Dec-99	2-Dec-99	2-Dec-99	2-Dec-99
1.2	***PERMITTING***					
	NEPA Completion	21-Oct-99	7-Dec-00	7-Dec-00	7-Dec-00	7-Dec-00
	FACE Water Permit	30-Jul-99	30-Jul-99	30-Jul-99	30-Jul-99	30-Jul-99
	ERP Permit	27-Jul-99	27-Jul-99	27-Jul-99	27-Jul-99	27-Jul-99
	NPDES Water Permit	13-Dec-99	15-Feb-00	15-Feb-00	15-Feb-00	15-Feb-00
1.3	***PRELIMINARY DESIGN***	3-Aug-98	3-Aug-98	3-Aug-98	3-Aug-98	3-Aug-98
1.4	***DESIGN / ENGINEERING***					
	Notice To Proceed					
	Boiler / AQCS	3-Aug-98	3-Aug-98	3-Aug-98	3-Aug-98	3-Aug-98
	Balance of Plant	1-Feb-99	1-Feb-99	1-Feb-99	1-Feb-99	1-Feb-99
	Material Handling	1-Feb-99	1-Feb-99	1-Feb-99	1-Feb-99	1-Feb-99
	40% Design Review	14-Jun-99	14-Jun-99	14-Jun-99	14-Jun-99	14-Jun-99
	90% Design Review	8-Sep-00	8-Sep-00	18-May-00	18-May-00	18-May-00
1.5	***FUELS SELECTION STUDY***	17-Oct-00	17-Oct-00	Not Presented	9-Sep-02	

	MILESTONE	Aug-99 Original Baseline	Feb-00 Updated Baseline	Sep-01 Updated Baseline	Jul-02 Approved DOE Schedule	Actual / Forecast Completion
DOE PHASE 2						
2.1	***PROJECT MANAGEMENT***					
	Project Management Plan Update	Not Sched	Not Sched	Not Sched	9-Sep-02	11-Nov-03
	Environmental Monitoring	Not Sched	Not Sched	Not Sched	Not Sched	Not Sched
	Startup Modification & Performance Report	Not Sched	Not Sched	Not Sched	6-Jan-03	03-Mar-04
	50% Construction Review	10-Nov-00	10-Nov-00	25-Jan-01	25-Jan-01	25-Jan-01
	100% Construction Review	14-Dec-01	14-Dec-01	14-Aug-01	14-Aug-01	14-Aug-01
2.3	***BOILER EQUIPMENT & AQCS***					
	Notice to Proceed	16-Aug-99	16-Aug-99	16-Aug-99	16-Aug-99	16-Aug-99
	Unit 2 - Boiler Island Foundations	17-Dec-99	20-Jan-00	20-Jan-00	20-Jan-00	20-Jan-00
	Unit 2 - Boiler Steel Erection	29-May-01	31-May-01	23-May-01	23-May-01	23-May-01
	Unit 2 - Raise Steam Drum	1-Jun-00	1-Jun-00	3-Jun-00	3-Jun-00	3-Jun-00
	Unit 2 - Hydrotest	29-May-01	14-Jun-01	23-May-01	23-May-01	23-May-01
	Unit 2 - Chemical Cleaning	1-Oct-01	1-Oct-01	10-Sep-01	10-Sep-01	10-Sep-01
	Unit 2 - First Fire (Gas)	2-Jul-01	5-Oct-01	30-Oct-01	30-Nov-01	30-Nov-01
	Unit 2 - Steam Blows	1-Feb-02	8-Oct-01	15-Nov-01	3-Jan-02	3-Jan-02
	Unit 2 - First Fire (Solid Fuel)	1-Oct-01	13-Oct-01	2-Dec-01	14-Feb-02	14-Feb-02
	Unit 2 - Initial Sync	1-May-02	9-Oct-01	1-Dec-01	19-Feb-02	19-Feb-02
	Unit 2 - Preliminary Substantial Completion	8-Aug-02	2-Jan-02	14-Feb-02	18-Jul-02	N/A
	Unit 2 Reliability Test	1-Feb-02	1-Feb-02	1-Apr-02	13-Sep-02	N/A
	Unit 2 - Substantial Completion	8-Nov-02	4-Apr-03	15-May-02	19-Sep-02	N/A
	Unit 1 - Boiler Island Foundations	26-Apr-00	9-Feb-00	9-Feb-00	9-Feb-00	9-Feb-00
	Unit 1 - Boiler Steel Erection	28-Aug-01	18-Sep-01	17-Aug-01	17-Aug-01	17-Aug-01
	Unit 1 - Raise Steam Drum	27-Sep-00	6-Sep-00	11-Sep-00	11-Sep-00	11-Sep-00
	Unit 1 - Hydrotest	28-Aug-01	18-Sep-01	27-Sep-01	4-Oct-01	4-Oct-01

	MILESTONE	Aug-99 Original Baseline	Feb-00 Updated Baseline	Sep-01 Updated Baseline	Jul-02 Approved DOE Schedule	Actual / Forecast Completion
	Unit 1 - Chemical Cleaning	8-Jan-02	23-Jan-02	18-Dec-01	18-Feb-02	18-Feb-02
	Unit 1 - First Fire (Gas)	8-Aug-02	20-Sep-02	3-Feb-02	13-Mar-02	13-Mar-02
	Unit 1 - Steam Blows	1-Feb-02	30-Oct-02	17-Feb-02	7-Apr-02	7-Apr-02
	Unit 1 - First Fire (Solid Fuel)	6-Sep-02	18-Oct-02	12-Mar-02	31-May-02	31-May-02
	Unit 1 - Initial Sync	6-Sep-02	17-Oct-02	11-Mar-02	29-May-02	29-May-02
	Unit 1 - Preliminary Substantial Completion	8-Aug-02	27-Dec-02	2-Jun-02	22-Sep-02	N/A
	Unit 1 - Reliability Test	10-Sep-02	29-Jan-03	24-Jun-02	21-Nov-02	N/A
	Unit 1 - Substantial Completion	8-Nov-02	1-Apr-03	31-Aug-02	21-Nov-02	N/A
2.4	***BALANCE OF PLANT***					
	Notice to Proceed	27-Jul-99	27-Jul-99	27-Jul-99	27-Jul-99	27-Jul-99
	Unit 2 - BOP Completion	4-Sep-01	9-Nov-01	17-Jan-02	8-Mar-02	8-Mar-02
	Unit 1 - Cutover Outage	Not Sched	Not Sched	15-Sep-01	15-Sep-01	15-Sep-01
	Unit 1 - BOP Completion	1-May-02	31-May-02	14-Jan-02	12-Apr-02	12-Apr-02
2.5	***MATERIAL HANDLING EQUIPMENT***					
	Conveyor Mechanically Complete	10-Aug-01	10-Jul-01	23-Oct-01	7-Nov-01	7-Nov-01
	Continuous Ship Unloader	17-Jul-01	4-Jun-01	3-Oct-01	3-Oct-01	3-Oct-01
	Fuel Storage Dome"A" - Stacker Reclaimer	20-Feb-01	12-Jun-01	28-Sep-01	28-Sep-01	28-Sep-01
	Fuel Storage Dome"B" - Stacker/Reclaimer	29-Aug-01	29-Aug-01	13-Nov-01	30-Nov-01	30-Nov-01
2.6	***TURBINE / GENERATOR REFURBISHMENT***					
	Unit 2 - Turbine Refurbishment	5-Oct-01	11-Jul-01	23-Nov-01	15-Feb-02	15-Feb-02
	Unit 1 - Turbine Refurbishment	1-May-02	1-May-02	3-Feb-02	12-Apr-02	12-Apr-02
DOE PHASE 3						
3.1	***PROJECT MANAGEMENT***					
	Project Management Plan Update	Not Sched	Not Sched	Not Sched	9-Sep-02	11-Nov-03

	MILESTONE	Aug-99 Original Baseline	Feb-00 Updated Baseline	Sep-01 Updated Baseline	Jul-02 Approved DOE Schedule	Actual / Forecast Completion
	Environmental Monitoring / Test Plan	Not Sched	Not Sched	Not Sched	23-Sep-02	24-Feb-04
	Public Design Report	Not Sched	Not Sched	Not Sched	6-Nov-02	19-Sep-03
3.4	***FUEL FLEXIBILITY***					
	Test 1 - 100% Pitt #8	Not Sched	Not Sched	1-Jul-02	14-Sep-02	16-Jan-04
	Test 2 - 50% Pitt #8 / 50% Petcoke	Not Sched	Not Sched	6-Sep-02	1-May-03	31-Jan-04
	Test 3 - 10% Pitt #8 / 90% Petcoke	Not Sched	Not Sched	7-Nov-02	1-Nov-03	10-Jul-04
	Test 4 - 100% Illinois #6	Not Sched	Not Sched	7-Jan-03	1-Feb-04	15-Jun-04
3.7	***FINAL REPORT***					
	Economic Evaluation Report	Not Sched	Not Sched	Not Sched	30-Jul-04	16-Feb-05
	Final Technical Report	Not Sched	Not Sched	Not Sched	17-Sep-04	31-Mar-05

APPENDIX 5

ABBREVIATION LIST

Following is a definition of abbreviations used in this report. Note that at their first use, these terms are generally defined in the text of the report, followed by the abbreviation in the parenthesis. Subsequent references use the abbreviation only.

Abbreviation	Definition
AHU	Air Handling Unit
AQCS	Air Quality Control System
BFP	Boiler Feed Pump
BIEB	Boiler Island Electrical Building
BMS	Burner Management System
BOP	Balance of Plant
BSA	Byproducts Storage Area
B&V	Black & Veatch
CCI	Control Components Inc.
CCW	Closed Cooling Water
CEMS	Continuous Emissions Monitoring System
CFB	Circulating Fluidized Bed
CIU	Control Interface Unit
CRH	Cold Reheat
CWTS	Chemical Waste Treatment System
DC	Direct Current
DCS	Distributed Control System
DOE	Department of Energy
dP	Differential Pressure
ECN	Engineering Change Notice
EHC	Electrohydraulic Control
EPC	Engineer, Procure, Construct

ETI	Electro Test Inc.
FAT	Factory Acceptance Test
FCS	Fossil Consulting Services
FDEP	Florida Department of Environmental Protection
FF	Fabric Filter
FRP	Fiberglass Reinforced Plastic
FSH	Final Superheater
FW	Foster Wheeler
FWCI	Foster Wheeler Construction Inc.
FWEC	Foster Wheeler Energy Corp.
FWESI	Foster Wheeler Energy Services Inc.
FWPS	Foster Wheeler Power Systems
FWSU	Foster Wheeler Start-up
GD	Gardner Denver
GE	General Electric
gpm	gallons per minute
HMI	Human-Machine Interface
HP	High-Pressure
HRA	Heat Recovery Area
HRH	Hot Reheat
ID	Induced Draft
IP	Intermediate Pressure
ISH	Intermediate Superheater
I&C	Instrumentation and Controls
LP	Low-Pressure
MCC	Motor Control Center
MCR	Maximum Continuous Rating
MOV	Motor Operated Valve

MS	Main Steam
MW	Megawatts
NGS	Northside Generating Station
NS	Northside
NSRP	Northside Repowering
N/A	Not Available
O&M	Operations and Maintenance
P&ID	Piping and Instrument Diagram
PA	Primary Air
PLC	Programmable Logic Controller
ppm	parts per million
PSC	Preliminary Substantial Completion
PSH	Primary Superheater
psig	pounds per square inch pressure gauge
PWO	Plant Work Order
RFP	Request for Proposal
rpm	Revolutions per Minute
RSH	Reheat Superheater
R&S	Roberts & Schaeffer
SA	Secondary Air
SDA	Spray Dryer Absorber
SH	Superheater
SJRPP	Saint Johns River Power Park
SNCR	Selective Non-Catalytic Reduction
SOP	System Operating Procedure
SUS	Secondary Unit Substation
TG 2	Unit 2 Generator Step-up Transformer
tph	tons per hour

TWIP	Turbine Water Induction Prevention
T/C	Thermocouple
UCC	United Conveyor Corp.
UHMW	Ultra High Molecular Weight
VFD	Variable Frequency Drive
WAPC	Wheelabrator Air Pollution Control
WP	Work Package
WTS	Work Task Scope
ZCC	Zachry Construction Corp.