APPENDIX B

U. S. NUCLEAR REGULATORY COMMISSION
REGION IV

NRC Inspection Report: 50-445/84-29
50-446/84-10

Construction Permits: CPPR-126
CPPR-127

Dockets: 50-445; 50-446

Category: A2

Licensee: Texas Utilities Electric Company (TUEC)
Skyway Tower
400 North Olive Street
Lock Box 81
Dallas, Texas 75201

Facility Name: Comanche Peak Steam Electric Station (CPSES), Units 1 and 2

Inspection At: Glen Rose, Texas

Inspection Conducted: July 22, 1984, through August 25, 1984

Inspectors: for D M Hunnicutt
J. E. Cummins, Senior Resident Reactor Inspector
(paragraphs 1, 2, 3, 4, 5, 6, 7, 10, 12, and 13)
11/8/84
Date

H. S. Phillips
H. S. Phillips, Senior Resident Reactor Inspector
(paragraphs 1, 8, 9, 12, and 13)
11/9/84
Date

D M Hunnicutt
D. M. Hunnicutt, Team Leader, Task Force
(paragraphs 1, 3, 4, 7, 11, 12, and 13)
11/8/84
Date

NRC Contract Personnel:

P. Snyder, Senior Nuclear Engineer, EG&G Idaho, Inc.
B. Cloward, Senior Power Engineer, EG&G Idaho, Inc.
V. Berg, Quality Engineer, EG&G Idaho, Inc.
D. Hill, Operations Specialist, EG&G Idaho, Inc.
R. W. Bonnenberg, Senior Engineer, EG&G Idaho, Inc.
R. R. Harbron, Senior Field Engineer, EG&G Idaho, Inc.
L. H. Jones, Engineering Specialist, EG&G Idaho, Inc.
G. R. Thomas, Quality Engineer, EG&G Idaho, Inc.
B. L Freed, Management Specialist, EG&G Idaho, Inc.

Approved: D M Hunnicutt — 11/8/84
D. M. Hunnicutt, Team Leader, Task Force — Date

Inspection Summary

Inspection Conducted July 22, 1984, through August 25, 1984 (Report 50-445/84-29)

Areas Inspected: Routine, announced inspection of plant status, action on previous NRC inspection findings, action on applicant identified design/construction deficiencies (10 CFR 50.55(e) reports), inspection and enforcement bulletin followup, on-site followup of safety evaluation report open items, inspection of spent fuel rack installation, applicant management of quality assurance activities, audit of applicant surveillance of contractor quality assurance/quality control activities, interpass temperature control, and plant tours. The inspection involved 636 inspector-hours onsite and at TUGCO corporate offices by three NRC inspectors and NRC contract personnel.

Results: Within the ten areas inspected, one violation was identified (failure to follow procedural requirements for checking weld interpass minimum temperature, paragraph 10).

Inspection Summary

Inspection Conducted July 22, 1984, through August 25, 1984 (Report 50-446/84-10)

Areas Inspected: Routine, announced inspection of plant status, action on previous NRC inspection findings, action on applicant identified design/construction deficiencies (10 CFR Part 50.55(e) reports), inspection and enforcement bulletin followup, on-site followup of safety evaluation report open items, applicant management of quality assurance activities, audit of applicant surveillance of contractor quality assurance/quality control activities,

observation of work in progress on reactor vessel closure head, and plant tours. The inspection involved 121 inspector-hours onsite and at TUGCO corporate offices by three NRC inspectors and other NRC contract personnel.

Results: Within the nine areas inspected, no violations or deviations were identified.

DETAILS

1. Persons Contacted

*J. T. Merritt, Assistant Project General Manager, Texas Utilities Generating Company (TUGCO)
*L. Fikar, Executive Vice President Engineering, TUGCO
*R. Baker, Staff Engineer, TUGCO
*A. Vega, Site Quality Assurance Manager, TUGCO
*L. Popplewell, Project Engineering Manager, TUGCO
*D. Chapman, Quality Assurance Manager, TUGCO
J. B. Bodine, Electrical Maintenance Supervisor, TUGCO
D. Rencher, Technical Services Design Review Engineering Supervisor, Black & Veatch
R. Moller, Project Manager, Westinghouse
G. Maedgen, Welding Engineer Brown and Root (B&R)
J. Gilbreth, Civil Engineer, B&R
M. D. Palmer, Shift Test Advisor, TUGCO
B. Bhujang, Structural Job Engineer, Gibbs & Hill
G. McGrath, Results Engineering Supervisor, TUGCO
J. Keller, Preservice Inspection Engineer, TUGCO
B. Hamilton, Results Engineer, TUGCO
D. Davis, Maintenance Engineer, TUGCO

The NRC inspectors also contacted other plant personnel including members of the construction, operations, technical, quality assurance, and administrative staffs.

*Denotes those attending one or more exit interviews.

2. Plant Status

Unit 1

At the time of the inspection, construction of Unit 1 was approximately 98% complete with fuel loading scheduled for October 1984. The applicant continues to complete and turnover systems and areas from construction to operations. The turnover process is accomplished in two phases. The first phase takes place when construction completes a system or area and turns that system or area over to the startup group. The turnover process is completed for a system or area when operations make final acceptance of the system or area from the startup group. The table below shows the status as of August 25, 1984, of the 422 distinct areas identified by the applicant for turnover from construction to operations:

Total number of areas	422
Number of areas submitted to startup	347
Number of areas accepted by startup	347
Number of areas submitted to operations	248
Number of areas accepted by operations	109

The table below shows the status as of August 25, 1984, of the 331 distinct subsystems identified by the licensee for turnover from construction to operations:

Total number of subsystems	331
Number of subsystems submitted to startup	326
Number of subsystems accepted by startup	326
Number of subsystems submitted to operations	214
Number of subsystems accepted by operations	117

Unit 2

At the time of the inspection, construction of Unit 2 was approximately 65 percent complete with fuel loading scheduled for March 1986.

3. Action on Previous NRC Inspection Findings

(Open) Unresolved Item (445/8214-01): Alleged Unqualified Corner Field Welds on the Four 4' 6" by 4' 6" Box Structures on the Main Steam/Feedwater Pipe Whip Restraint - The AWS "Structural Welding Code," D1.1, page 14, figure 2.9.1 depicts a prequalified weld joint identical to that described by Mr. Atchison (reference: NRC Inspection Reports 50-445/82-14; 50-445/82-22) as shown on NPS Industries (NPSI) shop drawings. The NRC inspector reviewed the following to verify that the applicant has completed the corrective actions related to these corner field welds:

- Nonconforming Report (NCR) M-82-01589 R.1
- Final IR MS-1-0014363
- Repair Process Sheet (cracks in weld) for Weld Data Cards, Serial Nos. 40702, 40703, 40704, and 40955
- Drawing E-117-D-153 for Weld 23
- Drawing E-117-D-157 for Weld 48
- Drawing E-117-D-140-1-AW for Weld 23
- NPSI Drawings E-117 and 118 for Weld 221
- Magnetic Partical Testing Reports T-1624, T-1625, T-2782, and T-2783
- Nondestructive Examination Procedure QI-QP-11.18-2, Rev. 1

This item will remain open pending further review during a subsequent inspection.

(Closed) Severity Level V Violation (445/8230-01): Failure to Follow Procedures - The NRC inspectors reviewed the corrective action taken by the applicant regarding the vendor certified stress calculations. In an attempt to further reduce the error rate of the pipe support design calculations, activities related to these calculations were being done at the CPSES site under TUGCO supervision. Some of these activities had previously been performed at offsite vendor facilities. The NRC inspectors reviewed approximately 160 randomly selected vendor certified stress calculations. These calculations were checked to determine if the

applicant had adequately corrected the problem with errors in calculations for component and piping supports in safety-related systems. Nine of these calculations contained minor inaccuracies but in no case were the errors found to be significant. These minor errors were discussed with the cognizant applicant representative. The NRC inspector stressed to the applicant representative that the program for checking calculations should be continued and it was stressed that efforts should be made to further reduce the error rate. Based on the sample review of the vendor certified stress calculations, the inspector had no further questions regarding this matter.

(Open) Unresolved Item (445/8119-02): No Verification That Component Modification Cards (CMCs) Issued After Quality Control Hanger Acceptance are Included in the Hanger Installation Package and Reinspected by Quality Control - The applicant revised Procedures CP-CPM-9.10 and CP-QAP-18.2 to incorporate the following:

- Detailed distribution instructions to ensure that CMCs issued after hanger acceptance are forwarded for inclusion into the installation package.

- Instructions that require the cognizant quality engineer/quality control inspector to review the amended hanger package to assess the need for any rework and/or reinspection and to take appropriate action.

The NRC inspector reviewed these procedures and also verified by training record review that applicable personnel had been trained on the content of the revised procedures. This item will remain open pending further review during a subsequent inspection.

(Closed) Unresolved Item (445/8405-02): Compressibility of Epoxy Grout - The NRC inspector verified by review of applicant's Procedure CEI-25, Rev. 6, "Epoxy Grouting of Base Plates," that Escoweld 7502 grouting material had been deleted from the procedure. The NRC inspector also verified by review of NCR M-81-00849, Rev. 1, that the Escoweld 7502 grouting had been removed from the affected hanger base plates. The inspector has no further questions regarding this matter.

(Closed) Unresolved Item (445/8211-01): Piping and Support As-Built Verification Program - Applicant's analysis of the support resulted in a modification to the support that provided a 1/4" gap on either side of the pipe such that lateral thermal displacement is not restrained. The NRC inspector verified applicable portions of the applicant's response by comparing the completed support installation to Design Drawing BRHL-AF-1-SB-003. No discrepancies were noted.

(Closed) Unresolved Items (445/8218-01; 445/8219-01; and 445/8222-01 related to IE Information Notice No. 82-34): Welds in Main Control Panels -An NRC inspector performed an inspection of the hot shutdown panel (CP2-ECPRLV-01) and determined that the weld anomalies on this panel

exceeded the maximum permitted for the types and severity of weld defects (examples: porosity, uneven fillet length, undersize welds, weld splatter adhering to panel and weld areas, and weld wire remnants attached to the structure) found in the installed panels at Comanche Peak, Unit 1. This panel, CP2-ECPRLV-01, was subsequently qualified by a seismic simulation test using a bi-axial shaker table. Other panels for Comanche Peak were similarly qualified.

This seismic simulation test met the requirements of Gibbs & Hill, Inc. Specification 2323-MS-605 (Rev. 1), including the requirements of IEEE-344-1975. This panel and the other panels successfully survived a series of earthquake simulations without any weld related failures. Panels and cabinets in question can now be qualified by comparison to physically similar "seismic simulation test qualified" panels and cabinets, since the weld adequacy has been demonstrated. Criteria for comparison include:

Overall dimensions
Anchorage mechanisms
Seismic required response spectra
Construction details, including material type and thickness, type of stiffeners, and weld quality

Analysis indicates that the lowest margin of safety of this panel and related panels is above the specified lowest margin of safety. All margins of safety are based on normal stress applied to analytical model beam elements. The stresses applied to CP2-ECPRLV-01 panel welds were artificially increased by the flexible mounting configuration, thus providing a greater margin of safety or conservatism.

An SDAR (50.55(e) Report) was originally issued on March 21, 1980, to confirm a verbal report to NRC that control board welded connections had deficiencies that were identified by applicant QA staff inspections during February 1980. These deficiencies were described as follows:

1. The specified eight inch spacing of the welds was found to vary from sixteen to eighteen inches on several panels.

2. Some of the panels had been set on buttered weld surfaces some 1/4 to 5/16 inches above the embed surfaces.

3. Where the panels were resting on the buttered weld surfaces, the embed to panel welds were undersize and in many cases did not possess sufficient leg or throat dimensions to be considered a fillet weld.

The applicant prepared as-built drawings of the welds on each panel. These drawings and a complete weld plot were made on panels CP1-ECPRBC-1 through -11.

The weld plots were analyzed by Reliance Electric to determine the extent of rework. Gibbs & Hill made recommendations after reviewing the Reliance

Electric recommendations. Design changes were completed subsequent to the completion of the Gibbs & Hill review. Work packages on each panel were prepared, showing step by step implementation of the Reliance Electric recommendations.

NRC followup on this reported series of deficiencies on control board welded connections was reported in the following inspection reports:

1. 445/82-18 (Unresolved Item 8218-01)
2. 445/82-19 (Unresolved Item 8219-01)
3. 445/82-22 (Unresolved Item 8222-01)
4. 445/83-02 (Inspection performed at Reliance Electric Company, Stone Mountain, Georgia)

Based on the review of this matter, including the applicant corrective actions, the NRC has no further questions regarding this item at this time and the item is considered closed.

(Closed) Severity Level IV Violation (445/8324-04; 446/8315-04): Failure to Provide Adequate Control of Ventilation System Fabrication - The applicant issued a potential 10 CFR Part 50.55(e) report (SDAR CP-83-06, dated March 1, 1984) and subsequently issued a stop-work order on March 8, 1984 (CPPA-28,428) on all structural welding at CPSES. These two documents were the result of identified welding dimensional discrepancies or incorrect member sizes on duct support welding. The stop-work order was lifted on April 27, 1984.

The inspection was initiated to determine the applicant's corrective actions related to failure to provide adequate control of ventilation system fabrication (reference: NRC Inspection Report 50-445/83-15; 50-446/83-12, Severity Level IV Violation).

The NRC inspector reviewed the four separate phases of reported activities performed by Corporate Consulting and Development Company, Ltd. (CCL) for the licensee. These evaluations and recalculations are contained in the following:

TUSI CPSES Ductwork Evaluation of Nonconforming Welds, dated July 25, 1983

Phase I, CCL Report A-548-83-01

Phase II, CCL Report A-548-83-02

Phase III, CCL Report A-571-83-01

Phase IV, CCL Report A-578-83

Phase I (CCL Report A-547-83-01) detailed a review of 104 duct supports to obtain a preliminary assessment of nonconforming welds. These duct supports were selected for detailed weld inspection based on evidence that

some welds were not in accordance with installed guidelines. The CCL engineering review was to evaluate the actual welds in comparison to the specified welds on a case-by-case, joint-by-joint basis. CCL recommended that the evaluation be carried to a greater depth to examine in detail duct supports known to have high weld stresses as the sample of 104 duct supports did not include supports which were heavily stressed.

In Phase II (CCL Report A-548-83-02), CCL identified all duct supports with weld stresses greater than 1/2 safe shutdown earthquake (SSE) allowable weld stress. A total of 240 duct supports were identified. CCL completed a review of the structural adequacy of 240 duct supports with the highest weld stresses. These duct supports were selected by reviewing CCL Seismic Qualification Report of Seismic Category I Ductwork and Hangers for CPSES - CCL Report A-424-91-05.

The CCL engineering review evaluated the welds, assuming 1/2 of the specified thickness and 75% of the specified length on a case-by-case, joint-by-joint basis. This CCL review determined that all welds in the heating, ventilation, and air conditioning (HVAC) duct supports will carry the design loads and meet the specification requirements relative to allowable stresses and exhibit an additional margin of safety.

Even though all duct supports were shown to be adequate, three (RB1-PS25, CB-852-1N-4F, and CB-852-2N-4E) of the eight duct supports with the highest identified weld stresses were determined to be qualified by an evaluation using actual weld size and length rather than the assumption of 1/2 specified thickness and 75 percent of specified length. There were no duct supports qualified by similarity to these three duct supports. CCL concluded that the ductwork and supports meet functional design requirements based on Phase I and Phase II evaluations of the weld nonconformances on the CPSES duct supports.

In Phase III (CCL Report A-571-83-01), a statistical sample of 285 duct supports were physically reinspected to establish engineering assumptions used in Phase III engineering analysis (licensee office memorandum, dated March 29, 1983, from L. M. Bielfeldt to R. G. Tolson stated a sample size of 280 duct supports was required to achieve a 95 percent confidence level that greater than 95 percent of the duct support welds are adequately sized). CCL completed a review of the structural adequacy of the 285 duct supports. This study demonstrated that the welds on the HVAC duct supports will carry the design loads, meet the specification requirements for allowable stresses, and maintain a load carrying safety margin. Of the 285 duct supports reviewed, none were found to be overstressed after examination of the actual weld details and loads existing on these welds.

In Phase IV (CCL Report A-578-83) CCL presented an analysis which uses data from accessible hangers in conjunction with data from the inaccessible hangers as a basis for evaluation. Because 57 hangers were inaccessible and detailed inspection could not be performed, it was necessary for CCL to perform statistical techniques to evaluate the adequacy of these 57 hangers.

Statistical methods were employed to determine the probabilities that specific joints on specific hangers would not be overstressed under both operating basis earthquake and SSE scenarios. The probability that at least one joint would not be overstressed was also obtained. Statistical analysis provided the probability or confidence level (for the belief that the joints were not overstressed) calculations for the 620 joints on the 57 hangers). Six hundred and sixteen joints have calculated confidence levels of 99.9 percent or greater, while the remaining four joints have confidence levels of at least 98.9 percent. The four hanger joints with confidence levels less than 99.9 percent are: CB-830-1N-4Q, CB-830-1N-4Q, CB-830-1N-4F, and CB-830-1N-4R (NOTE: hanger CB-830-1N-4Q had two joints with confidence levels less than 99.9 percent, thus hanger CB-830-1N-4Q had a calculated confidence level of 98.9 percent that no weld joint on this hanger is overstressed).

CCL reevaluated the fan coil unit supports for CP1-VAAUSE-05 and -06. Reevaluation indicated that dimensional changes do not affect the seismic adequacy of the supports (see Bahnson Service Company Drawing FCUS-0010, Sheet 1 of 3 sheets). The seismic qualification for the fan coil unit supports is discussed in CCL Report A-456-82-01. The seismic analysis used floor response spectra curves for safeguards building el. 873'. These fan coil unit supports are attached to the ceiling (overhead) of the safeguards building el. 802'. The CCL reevaluation determined that the anchor bolts for the fan coil unit supports are acceptable with a small safety factor. Beam member stress and the compression member coefficient in the seismic qualification report indicated large safety factors for each of these two areas.

The NRC inspector determined that the CCL evaluations and calculations were made using reasonable assumptions and with acceptance data and that the calculation results were adequate.

The NRC randomly selected 13 duct supports in 4 different systems and inspected 11 duct supports (2 were inaccessible) in detail. The NRC inspector used FSAR, Section 9.4, the approved design and installation drawings, and all phases of the CCL report to determine the as-built condition. The NRC inspector evaluated the following attributes during the physical portions of duct support inspections:

Duct Supports	Duct Segments
Location	Size
Welding	Location
Dimensional Requirements	Orientation

In addition, a previous NRC inspection (reference: NRC Inspection Report 50-445/84-10, paragraph 6) of the HVAC included inspection by NRC inspectors of 24 duct supports and approximately 120 feet of duct in the CPSES, Unit 1 cable spread room, review of Bahnson procedures pertaining to the fabrication, installation, and inspection of the seismic duct and hangers, and a review of CCL Report A-579-83.

These two NRC independent inspections (50-445/84-10 and this inspection) determined that the scope of the CCL evaluation was adequate to evaluate the identified discrepancies in the Bahnson fabricated and installed duct supports.

(Open) Open Item (445/8323-07): Review of Hanger Package Records -The licensee has formed a hanger task force and has instituted a total package concept. This concept is designed to prevent having parts of packages in the field. Three Class V hanger packages were reviewed by the NRC inspector for current drawings, inspection reports, and CMCs. Revision of drawings and CMC incorporation into drawings were verified to be current through the document control center. The backlog of records at the time of the NRC inspector's review was approximately 1 day.

The following items are being reviewed by NRR and the Atomic Safety and Licensing Board (ASLB) and Region IV will take appropriate followup action as dictated by the conclusions of the reviews:

- Open Item (445/8226-05): Analysis of Pipe Support MS-1-003-009-C72K
- Unresolved Item (445/8226-06; 446/8214-05): Excessive Deflections in Supports
- Unresolved Item (445/8226-07): Stress Analysis of Pipe Support CC-1-107-008E23R
- Open Item (445/8226-04; 446/8414-03): Stability of Box Frames

These matters are considered open pending completion of the actions by the ASLB and NRR.

4. Action on Applicant Identified Design/Construction Deficiencies (10 CFR Part 50.55(e) Reports)

The 10 CFR Part 50.55(e) reports identified in the table below were reviewed by the NRC inspectors and closed. The 10 CFR Part 50.55(e) reports were reviewed for content, compliance with NRC requirements for reporting, appropriate evaluation, and adequacy and implementation of corrective action. The 10 CFR 50.55(e) reports identified in the table below were evaluated by the applicant and determined to be not reportable. Each report is identified and tracked by the unique, assigned number shown in the left column

50.55(e) Report Number	Subject	Applicant Letter Number
CP 77-08	Installation of Pipe Whip Restraint Anchor Bolts, Nuts and Plates	TXX-2474
CP 77	Cadweld Test Specimen Rebar Failure	TXX-2269
CP 77-05	Omission of Boron Recycle Evaporator Foundation Anchor Bolts	TUS-1416 (Memo)
CP 83-03	Review of Procurement and Installation Activities for Non-metallic Insulation on Stainless Steel Lines may not be in Strict Compliance with Regulatory Guide 1.36 (FSAR, Section 1A(B)15&16)	TXX-3624
CP 77-02	Concrete Curing Blanket Fire (Service Water Intake Structure)	TXX-2265
CP 78-06	Cadweld Sleeve Failure	TXX-2896
CP 84-01	Lamination in Cable Tray Support Column	TXX-4154
CP 78-01	Service Water Pump Supports	No licensee letter
CP 79-12	Internals for filters for Atmospheric Cleaning Units	CPP-2669 (TUSI Memo)
CP 80-01	Service Water Pumps - Manufacturer's Defect	No licensee letter
CP 80-06	Reactor Upper Internals Roto-Lock Insert	TXX-3217
CP 82-04	Pacific Pump Multi-Vane Diffuser Linear Indications	TXX-3634
CP 82-14	Reactor Coolant Pressurizer Surge Line	TXX-3592

50.55(e) Report Number	Subject	Applicant Letter Number
CP 84-06	Pipe Support Design Error	TXX-4107
CP 84-13	Final Safety Analysis Report and Technical Specification Consistency	TXX-4213
CP 84-A	Vendor Inspector Eye Exams	TXX-4204
CP 84-B	Vendor Supplied Stock Material	TXX-4161
CP 84-15	Indeterminate Fluoride Content of Manville Insulation	TXX-4221

The 10 CFR Part 50.55(e) reports discussed below were evaluated and determined to be reportable. Each report is identified and tracked by the unique applicant assigned number shown at the beginning of each discussion.

- CP 77-B - Fuel Building Crane Girder Design. Applicant letter (TXX-2609) dated November 18, 1977, reported to the NRC that this deficiency was reportable and delineated corrective actions. The deficiency involved crane girder support design load combinations for the fuel building crane. The stress analysis for the fuel building was repeated, including the seismic response of the lifted load. Modification of the building structural design was required in the fuel building upper walls, roof and roof beams, crane rail supports, and crane trolley stops. These changes were incorporated into the structural drawings. The problem apparently occurred during the design data transfer between the architect engineer's structural special analysis group and the structural design group. The design data for other seismic Category I cranes was checked and found to be correct.

- CP 83-02 - Westinghouse Motor Operated Gate Valve Position Indication. Applicant's letter (TXX-3633) dated February 25, 1983, reported to the NRC that this deficiency was reportable and delineated corrective actions. The deficiency was that certain Westinghouse gate valves would indicate "closed" prior to the valve disc fully isolating flow. This could have resulted in a situation where flow was reduced, if the valve were to bind or stall after reaching the "closed" indication position but prior to the valve disc fully isolating flow. The affected valves in safety-related applications have been modified to correct this condition.

- CP 83-20 - Broken Tack Welds In Westinghouse Supplied 480VS Switchgear. Applicant letter (TXX-4078) dated November 16, 1983, reported to the NRC that this deficiency was reportable and delineated corrective action. Westinghouse Model DS-416 breakers were found to have unacceptable tack welds on the secondary disconnect support bracket. A 100% inspection of the DS-416 breakers

was performed and all support brackets with defective or suspect welds were replaced (36 brackets were replaced).

No violations or deviations were identified.

5. Inspection and Enforcement Bulletin (IEB) Followup

The NRC inspectors reviewed the applicant's file for each of the IEBs discussed below and performed inspections when required to verify that the applicant had conducted an adequate review to determine if the IEB was applicable to the CPSES facility, and to verify that the applicant had taken the required action on applicable IEBs.

IEB Number	Subject
79-02	Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts
82-01, Rev. 1, Supplement 1	Alteration of Radiographs of Welds in Piping Subassemblies
79-07	Seismic Stress Analysis of Safety-Related Piping
78-12, -12A, -12B	Atypical Weld Material in Reactor Pressure Vessel Welds
80-08	Examination of Containment Liner Penetration Welds
80-03	Loss of Charcoal From Standard Type II, 2-inch Tray Absorber Cells
80-05	Vacuum Condition Resulting in Damage to Chemical Volume Control System Holdup Tanks
83-03	Check Valve Failures in Raw Water Cooling Systems of Diesel Generators
83-07	Apparently Fraudulent Products Sold by Ray Miller, Inc.

a. IEB 81-03: Flow Blockage of Cooling Water to Safety System Components by Corcibula SP (Asiatic Clam) and Mytilus SP (Mussel)

In response to IEB 81-03, TUGCO letters TCP-1216 and TCP-83073 stated that an inspection by an independent consultant of the cooling water sources for CPSES, Squaw Creek reservoir (SCR) and Safe Shutdown Impoundment (SSI), had found no clams (Corbicula)

present in any of the areas sampled. Based on this, the licensee committed to semiannually sample likely Corbicula habitat areas in the SCR and the SSI. The semiannual inspection performed in December 1983 identified live Corbicula in the SCR and the SSI.

When the licensee determined that Corbicula was present in the cooling water sources Procedure ENV-211 for sampling the cooling water sources was cancelled and action was taken by the licensee to deal with the existence of Corbicula in the cooling water sources. The licensee is presently setting up programs for monitoring the service water system and the fire protection system for Corbicula infestation. The following specific actions that have been taken and or will be taken were delineated in TUGCO memorandum TIM-840142, dated January 18, 1984.

- The Unit 1 component cooling water heat exchangers and a selected number of service water strainers were opened and inspected. Clams estimated to be one growing season old were found in the strainer baskets.

- Strainers and heat exchangers in safety-related systems and components using service water will be added to the licensee's routine maintenance program to periodically inspect for clam infestation.

- Service water system flow rates will be monitored and trended to detect any blockage of the flow paths. The base line flow rates for this trending will come from preoperational test data and the licensee will initiate trending activities upon completion of the preoperational testing of the service water system.

- The fire protection system will be inspected for clam infestation as part of a semiannual flush which is performed in accordance with Procedure OPT-220A, "Fire Suppression Water and Sprinkler System Operability Test."

- The licensee performs chlorination of the service water and fire protection bay in accordance with Procedure SOP-501A, "Station Service Water System," to help control biofouling.

The NRC inspectors will continue to monitor the service water and fire protection systems as part of routine NRC inspections.

b. IEB 79-02: Pipe Support Base Plate Designs Using Concrete Expansion Anchor Bolts.

The NRC inspector determined from review of documentation and discussions with cognizant applicant personnel that the requirements of IEB 79-02 through Revision 2 appeared to be met by the licensee. Design assumptions at CPSES now include the component support baseplates, which fall under the provisions of IEB 79-02, are flexible. Consistent analytical methods are in place at CPSES for baseplate and anchor load analyses. A testing program was conducted to determine anchor bolt torque valves and to assure the required anchor preloads.

c. IEB 79-07: Seismic stress analysis of safety-related piping.

No corrective action was required as the seismic analysis of safety-related piping at CPSES did not utilize the deficient summation methods outlined in this IEB.

d. IEB 80-03: Loss of charcoal from Standard Type II, 2-inch tray absorber cells.

A visual inspection of the absorber section was performed on a randomly selected number of ventilation units. The perforated screens were secured to the frames by spot welds spaced at 2-inch centers. No defective spot welds were observed and there was no evidence of the screens sagging away from the cell frames. The absorber cells used at CPSES were manufactured by C.V.I. Corporation.

e. IEB 80-05: Vacuum condition resulting in damage to Chemical and Volume Control System (CVCS) holdup tanks.

The applicant reviewed the CPSES design for all low pressure process or holdup tanks and concluded that the tanks have adequate measures to protect against vacuum conditions. The NRC inspector determined from an inspection of the volume control tank, the recycle holdup tank, and the waste holdup tank that the tanks appeared to be adequately protected against vacuum conditions.

f. IEB 83-03: Check valve failures in raw water cooling systems of diesel generators.

The valves at CPSES are corrosion resistant stainless steel and will be full stroke tested every three months. No response to this IEB was required from CPSES (construction permit holder).

g. IEB 83-07: Apparent fraudulent products sold by Ray Miller, Inc.

A search conducted by the applicant of the CPSES procurment files did not identify any materials.

A search of the CPSES procurement files did not identify any fraudulent materials which may have been supplied by Ray Miller, Inc. This search included a survey of vendors to CPSES who may have supplied fraudulent Ray Miller, Inc. material.

h. IEB 78-12: Atypical weld material in reactor pressure vessel welds.

Combustion Engineering Power Systems, the manufacturer of the applicant's reactor pressure vessels prepared a generic report in response to the requirements of IEB 78-12. The applicant determined from review and investigation that this report satisfactorily represented data for the reactor pressure vessel welds at CPSES.

i. IEB 80-08: Examination of line penetration welds

The NRC inspector determined that containment fluid head design piping penetrations were radiographed and no backing bars were used. This satisfied the requirements of this bulletin.

j. IEB 82-01: Revision 1, Supplement 1: Alteration of radiographs of welds in piping subassemblies.

The applicant performed a complete review of all radiographic film of piping subassemblies, furnished by ITT Grinnell. This review included Class 1, 2, and 3 piping and involved approximately 3,949 welds (39,760 radiographs).

No violations or deviations were identified.

6. On-Site Followup of Safety Evaluation Report (SER) Open Items

The NRC inspectors held discussions with cognizant applicant personnel and reviewed related documentation to determine which actions the licensee had taken to fulfill commitments made to each of the SER items discussed below.

a. SER, Section 2.5.6.5, page 2-37; Supplemental Safety Evaluation Report (SSER) 1, Section 2.4.3.1, page 2-1; and SSER 1, Section 16, page 16-2

Subject: Technical Specification for Annual Inspection of Integrity of the Rip-Rap Construction Protection for the Safe Shutdown Impoundment (SSI)

Findings: The applicant had implemented Procedure EDA-304, Rev. 0, "SSI Dam Inspection," which describes the required inspections of the integrity of the rip-rap construction on the SSI. An inspection of this area was made in accordance with EDA-304 on September 20, 1983, and no discrepancies were found. A visual inspection of the SSI was performed by a consultant on August 25, 1982, and no discrepancies were found. The licensee was in the process of revising the procedure for accomplishing the SSI annual inspection. As a result of this revision, Procedure EDA-304 will be superseded by Procedure EGT-758 which was in the applicant's procedure concurrence cycle at the time this NRC inspection report period ended.

b. SER, Section 2.5.6.7, page 2-39

Subject: Technical Specification for Survey and Visual Inspection of SSI to Record Instrument Readings Annually

Findings: The applicant had implemented Procedure EDA-304, Rev. 0, "SSI Dam Inspection," which documents annual readings of the surface alignment monuments and the well point piezometers. Reference data for the SSI surface alignment monuments are based on readings taken on June 23, 1980. Piezometer measurements for the SSI have been recorded annually since 1979. The applicant was in the process of revising the procedure for accomplishing the SSI annual inspection. As a result of this revision, Procedure EDA-304 will be superseded by Procedure EGT-758 which was in the applicant's procedure concurrence cycle at the time this NRC inspection report period ended.

c. SER 1, Section 2.4.8, page 2-2; SER, Section 2.4.8, page 2-23; and SSER, Section 16, page 16-2

Subject: Program to Monitor Sediment Buildup in the SSI and Technical Specification Procedure for Sediment Removal

Findings: The applicant had implemented Procedure EDA-304, Rev. 0, "SSI Dam Inspection," which addresses the annual inspection of the

Station Service Water (SSW) intake channel. Base line data for the actual elevation of the SSW intake channel bottom was collected on March 10, 1983, by use of a measured sounding line and weight. The elevation was measured at locations 50, 75, and 100 feet upstream of the SSW intake structure. The applicant was in the process of revising the procedure for accomplishing the SSI annual inspection. As a result of this revision, Procedure EDA-304 will be superseded by Procedure EGT-758 which was in the applicant's procedure concurrence cycle at the time this NRC inspection report period ended.

d. SER, Section 3.5.3, page 3-10

Subject: Final Design of Concrete Missile Barrier on Top of Diesel Fuel Storage Tanks

Findings: The NRC inspector verified the adequacy of the concrete missile shield on top of the diesel fuel storage tanks by performing a review of selected portions of the applicant's missile barrier calculations. This review indicated to the NRC inspector that the design meets the requirements and intent of FSAR, Section 3.5. The concrete barrier slab design is for a depth of 1' - 9" is identical in thickness to roof Category I safety-related concrete structures designed to provide environmental missile protection. The NRC inspector reviewed B&R Drawings 2323-S-03061, 2323-S-0307, "Diesel Fuel Oil Storage Cover," as amended by DCA-12316, Rev. 3 which detailed the missile barrier slab layout and cross sections.

e. SER, Section 6.2.3, page 6-11

Subject: 18-inch Containment Pressure Relief Valves Qualified for Closure at 50 PSIG; Installation of Seismic Category I Debris Screen

Findings: The NRC inspector reviewed Nordan Test Report 2060-R-001 which documented testing of valves of an identical design to the installed 18" containment pressure relief valve. The testing involved 12" and 30" valves and required that the valves be opened and closed against 275 psi upstream pressure.

The NRC inspector reviewed the seismic screen structural analysis (Seismic Category I) for the containment pressure relief valve, verified that the debris screen was installed on containment pressure relief valve 1HU5549, and reviewed the environmental qualification certificate data for the valve operator for valve 1HU5549.

No violations or deviations were identified.

7. Spent Fuel Storage Racks (Unit 1)

The NRC inspector reviewed the installation records for the Unit 1 spent fuel racks. The records indicated that installation was as required. New fuel elements are presently stored in these fuel racks. The NRC inspector reviewed the documentation in the following:

Traveler ME-83-1055-4000
Traveler ME-82-2239-4000
Reference Drawing (Westinghouse) 6125E32
Traveler ME-82-2204-4000
Traveler ME-83-1078-4000
B&R, Inc. CPSES Material Requisition 165792, dated June 14, 1982
Weld Filler Material Log B-1914
NCR M-80-00085 R.5
Welder Qualifications for Welder Symbol BR4 - dated April 16, 1983
(Westinghouse) Procedure 2463A81, "Installation Procedure for 16-inch Spaced Spent Fuel Storage"
DCA-13,296 (Modify Rack to Fit Anchor Bolts)
DCA-13,716 (Accept As-Built Location of Rack as Shown on Stearns-Roger Drawing 8934/4-23, Rev. F
Traveler ME-81-2054-4000

The NRC inspector determined that the licensee adequately prepared, reviewed, and maintained an acceptable system of quality records. The NRC inspector determined that these spent fuel racks do not indicate a potential generic problem; however, the licensee does plan to replace the existing spent fuel racks with new "high density" spent fuel racks at a later date.

The NRC inspector determined that the licensee personnel involved with the installation of spent fuel storage racks were qualified to perform their assigned tasks. The NRC inspector reviewed applicable sections of the Safety Analysis Report and SER (Sections 1, 3, 9, and 17) and applicable referenced codes and standards. In addition, Regulatory Guides 1.13, 1.29, 1.38, 1.58, and 1.88 and ANS 57.2 (ANSI N210) were reviewed.

No violations or deviations were identified.

8. Applicant Management of Quality Assurance Activities

During this inspection report period, the NRC inspectors initiated but did not complete an inspection of the applicant's management of quality assurance activities. The inspection is being performed to determine the status and effectiveness of applicant management and implementation of the corporate quality assurance program for ongoing activities of design, procurement, and construction. The inspection included a review of both corporate and on-site quality assurance management and programs.

The findings and details of this inspection will be reported in a subsequent NRC inspection report.

9. Applicant's Surveillance of Contractor Quality Assurance/Quality Control Activities

During this inspection report period, the NRC inspectors initiated but did not complete an inspection of the applicant's surveillance of contractor

quality assurance/quality control activities. The inspection is being performed to determine whether the applicant's implementation of quality assurance responsibilities relating to surveillance of contractors is consistent with the quality assurance program described in the application for the construction permit.

The findings and details of this inspection will be reported in a subsequent NRC inspection report.

10. Minimum Welding Interpass Temperature Control

In response to a request from the ASLB to look into allegations concerning welding practices at CPSES, NRC inspectors interviewed a number of welders employed at CPSES. These interviews were conducted during the first 2 weeks in March 1984. The NRC inspectors determined from these interviews that there were instances in which welders did not use temperature indicating crayons to verify interpass temperatures as required by B&R Welding Procedure Specification WPS-11032. Subsequently, the NRC Region IV office, in a letter, dated April 23, 1984, requested that the licensee respond to specific questions concerning welding practices at CPSES. The licensee, in his response letter, dated June 15, 1984, stated that it had been determined from interviewing welders that some of the welders had not always complied with the requirement to use temperature indicating crayons to verify minimum interpass temperature, but that the welder sometimes used judgement to determine that minimum interpass temperature requirements were met. The failure to use temperature indicating crayons as required is an apparent violation. (445/8429-01)

The applicant provided additional information related to welding practices in his letter TXX-4300, dated September 17, 1984. This additional information included corrective actions designed to resolve the monitoring of minimum interpass temperatures discussed above. These corrective actions included the following:

- Revisions to applicable welding procedures to clarify the use of positive temperature indication between each weld layer.

- Training of welders on these procedure changes.

- Welding engineering department and quality control personnel will perform surveillances to insure the interpass temperature control requirements are being met.

The NRC inspector determined from reviewing revisions to selected procedures, welder training records, and quality control interpass weld surveillance records that the corrective actions described above had been implemented or were in the process of being implemented. Portions of the following documents were reviewed by the NRC inspector:

CP-CPM 6.9D, Rev. 6, Document Change Notice (DCN) 4, "Welding and Related Processes" (in concurrence cycle at time of NRC review)

CP-CPM 6.9B, Rev. 2, DCN 1, "Weld Filler Material Control" (in concurrence cycle at time of NRC review)

QP-QAP 11.1-26, Rev. 16, "ASME Pipe Fabrication and Installation Inspections"

Documentation of welder training on use of thermometers which was completed on September 26, 1984

Quality control surveillance of interpass welds records.

This item is closed.

11. Observations of Work in Progress on Reactor Vessel Closure Head, Unit 2

The NRC inspector selected the reactor vessel closure head, Unit 2, as a representative component to observe work performance, partially completed work, and completion of a portion of the work.

a. Receipt Inspection

(1) Initial Receipt

The NRC inspector reviewed the material received record for 100 "Y" inserts. These "Y" inserts were procured on Purchase Order CP-0001, 460600, dated June 4, 1984. The "Y" inserts conformed to Westinghouse drawing 271C740, Rev. 3. The material is identified on Material Report 11907.

(2) Nonconforming Items

One head adapter plug, S/N U420A08, was found to have an unacceptable female head plug weld edge to the mating land surface. The specified tolerance was 5.125" + 0.002". The actual dimension was 5.12225". A "hold tag" had been applied.

(3) Documentation

The reviewed documentation had been properly prepared and was being maintained as required by receipt inspection instructions.

b. Storage, Handling, and Protection

(1) Storage and Protection

The control rod drive mechanism housings (CRDMH) (latch and rod travel) were protected in wooden crates as required by manufacturer's instructions. Each CRDMH was inspected for

damage by licensee and Westinghouse personnel when it was removed from the crate.

(2) Cleanliness

The CRDMHs, the head adapter plugs, and the closure head housing extensions were maintained in a clean condition. The housekeeping in the plastic enclosed area was adequate for installation and welding performed.

(3) Surveillance Activities and Documentation

The applicant and contractor personnel performed surveillance by requiring review and concurrence by quality assurance personnel, mandatory holdpoints for Authorized Nuclear Inspector (ANI) review and observation, and by contractor engineer observing the installation, NDE, weld repairs, and related activities.

c. Installation

(1) Observations of Installation Activities

The NRC inspector observed the various installation activites, including installation of five head adapter plugs; nine CRDMHs; seal welding of five components (two head adapter plugs and three CRDMHs); repair of two seal welds; cleaning, application of dye penetrate and developer, interpretation of liquid (dye) penetrant test (PT) results; documentation of satisfactory and rejectable PT results; weld metal requirements; repair welds by a welder, symbol ARK; and other related installation activities.

(2) Personnel and Equipment

The applicant and contractor personnel performing the various installation activities were qualified as required. The welder and NDE personnel had met the recommended requirements for their respective work assignments. The specialized equipment, automatic welding apparatus, was properly checked out prior to use and was properly positioned prior to start of argon purging and subsequent welding operation.

(3) Drawings and Work Procedures

The NRC inspector observed that the appropriate procedures and drawings were available in the immediate work area and that these documents were the latest revision and were legible. The work results were documented as work progressed. The workmen referenced the document package during various work activities prior to performing subsequent work-related activities.

(4) Hold Points

The NRC inspector observed that all work was stopped at a designated hold point required by the ANI. The seal weld was not attempted until the ANI reviewed the work package and authorized the seal weld on head adapter plug 24.

(5) Preparation and Maintenance of Records

The NRC inspector reviewed the work package being prepared as the work progressed and observed that the record was maintained. The entries made in the record were legible, errors were lined out and properly re-entered, and the records were kept in an area free from oil or other materials that could render the entries illegible.

d. Documents Reviewed

The NRC inspector reviewed the following documents related to the observed work activities associated with the installation of CRDMHs and head adapter plugs:

CE Drawing E11773-161-002, Rev. 6
Work Sheet - CP 2 Selective Positioning and Welding Plan
Westinghouse Drawing 1553 E 84, Sheets 1 and 2, Rev. 2
Weld Procedure Specification 99029, Rev. 3
Traveler ME 84-4548-5500
Traveler ME 84-4611-5500
Traveler ME 84-4586-5500
Traveler ME 84-4588-5500
Traveler ME 84-4589-5500
Traveler ME 84-4587-5500
Traveler ME 84-4585-5500
Traveler ME 84-4661-5500
Repair Process Sheets for Weld Data Cards, Serial Nos. 00360 (Weld FW-18) and 00131 (Weld FW-12)
QI-QAP-10.2-1, "Liquid Penetrant Examination," Rev. 3, dated February 18, 1983
QI-QAP-2.1-1, "NDE Personnel Certification"
SAR Chapters 3, 5, 6, 9, and 17

No violations or deviations were identified.

12. Plant Tours

At various times during the inspection period, the NRC inspector conducted general tours of the reactor buildings, fuel building, safeguards building, electrical and control building, and the turbine building. During the tours, the NRC inspector observed housekeeping practices, preventive maintenance on installed equipment, ongoing construction work, and discussed various subjects with personnel engaged in work activities.

No violations or deviations were identified.

13. Exit Interviews

The NRC inspectors met with members of the TUEC staff (denoted in paragraph 1) at various times during the course of the inspection. The scope and findings of the inspection were discussed. The applicant acknowledged the findings.