



Inspection Summary

Inspection Conducted March 20, 1984, through May 18, 1984 (Report: 50-445/84-12)

Areas Inspected: Routine, announced inspection of plant status, licensee action on previous findings, 10 CFR 50.55(e) report followup, allegation followup, Inspection and Enforcement Bulletin followup, and plant tours. The inspection involved 170 inspector-hours onsite by four NRC inspectors.

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

Inspection Summary

Inspection Conducted March 20, 1984, through May 18, 1984 (Report: 50-446/84-06)

Areas Inspected: Routine, announced inspection of plant status, licensee action on previous findings, 10 CFR 50.55(e) report followup, Inspection and Enforcement Bulletin followup, and plant tours. The inspection involved 26 inspector-hours onsite by two NRC inspectors.

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

DETAILS SECTION

1. Persons Contacted

- \*J.T. Merritt, Assistant Project General Manager, Texas Utilities  
Generating Company (TUGCO)
- \*A. Vega, Site Quality Assurance Manager, TUGCO
- R. G. Tolson, Staff-Project Manager, TUGCO
- G. Purdy, Site QA Manager, Brown & Root (B&R)
- H. Hutchinson, Project Control Manager, B&R
- G. L. Morris, Site Mechanical Level III ASME Quality  
Engineer, B&R
- F. L. Powers, Electrical/Control Building Manager, TUGCO
- S. Spencer, QA Auditor (Corporate Office), TUGCO
- J. Marshall, Licensing Supervisor (Corporate Office), TUGCO
- M. Riggs, Operations Support Engineer, TUGCO
- T. Taylor, Engineer, Battelle Pacific Northwest Laboratories
- K. V. Cook, Research and Development Engineer, Oakridge  
National Laboratory
- J. Enriotto, Manager, Material Technology, Westinghouse
- D. Adaomis, Senior Engineer, Westinghouse
- R. Dacko, Licensing Engineer, TUGCO
- J. Keller, Field 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

Construction of Unit 1 is approximately 97% complete with fuel loading scheduled for the end of September 1984. The licensee 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 makes final acceptance of the system or area from the startup group. The table below indicates the status, as of April 27, 1984, of the 423 distinct areas identified by the licensee for turnover from construction to operations:

Total number of areas	423
Number of areas submitted to startup	226
Number of areas accepted by startup	199
Number of areas submitted to operations	116
Numbers of areas accepted by operations	82

The table below indicates the status, as of April 27, 1984, of the 332 distinct subsystems identified by the licensee for turnover from construction to operations:

Total number of subsystems	332
Number of subsystems submitted to startup	314
Number of subsystems accepted by startup	313
Number of subsystems submitted to operations	57
Number of subsystems accepted by operation	27

Construction of Unit 2 is approximately 65% complete with fuel loading scheduled for March 1986.

3. Licensee Action on Previous Inspection Findings

(Closed) Severity Level V Violation 445/8324-01 and 446/8315-01:  
Failure to Provide Adequate Procedures, Instructions, or Drawing for  
Installation of Major Items of Equipment

The NRC inspector reviewed the licensee's stated corrective actions by reviewing and evaluating the following licensee procedures:

- QI-QAP 11.1-39, "Mechanical Equipment Installation Inspection", Rev. 0, dated February 2, 1983
- CP-QAP-12.1, "Inspection Criteria and Documentation Requirements Prior to System N-5 Certification," Rev. 8, dated August 3, 1983

The NRC inspector's review determined that the specification and the construction installation procedures for mechanical equipment installation were revised by requiring that the engineer specify the requirement for

safety-related mechanical equipment. A reinspection program has been instituted to verify mounting details on safety-related mechanical equipment by requiring an additional step in the inspection walkdown and maintaining an appropriate checklist. Licensee has completed reinspection, walked down systems, and checked "as built" conditions. The Master Data Base is up to date.

The NRC inspector verified that the licensee's corrective actions as stated in their response dated June 28, 1983, have been adequately implemented.

(Closed) Severity Level V Violation 445/8324-02 and 446/8315-02: Failure to Provide Adequate Maintenance of Materials and Equipment in Outdoor Warehouse Areas

The NRC inspector reviewed the licensee's stated corrective actions by reviewing and evaluating the following licensee procedures:

- QI-QAP-11.1-26, "ASME Pipe Fabrication and Installation Inspections," Rev. 11, dated March 18, 1983
- QI-QAP-11-28, "Installation Inspections of ASME Component Supports, Class 1, 2 and 3," Rev. 8, dated January 15, 1982
- QI-QAP-11.1-28A, "Installation Inspections of ASME Class 1, 2, and 3 'Snubbers'," Rev. 2, dated April 28, 1983
- CP-QAP-16.1, "Control of Nonconforming Items"
- QI-QAP-2.1-5, "Training and Certification of Mechanical Inspection Personnel"

The NRC inspector determined that QC inspection instructions have been revised to specifically address the verification of material conditions of items prior to installation and that storage conditions preclude deterioration of materials and equipment. Outside storage is monitored on a periodic basis by QA to determine the adequacy of storage and a preservation program has been established to clean, preserve, and/or paint any items showing signs of dirt or corrosion. The licensee has prepared a standard warehouse procedure that addresses storage requirements and conditions.

The NRC inspector verified that the licensee's corrective actions as stated in their response dated June 28, 1983, have been adequately implemented.

(Closed) Unresolved Item (445/8214-02): Review of Licensee's Method of Inspection of Skewed Welds, Dated November 8, 1982

An allegation that the licensee's QC inspection procedure for welding did not contain written instructions for examining skewed fillet welds was reviewed. (NOTE: Skewed welds are defined as those welds joining two structural members that are not in the same plane and are not perpendicular

to each other. A typical example is two members jointed at an angle of 45 degrees with a weld at the joint toe of 135 degrees and another weld at the heel at a 45 degrees angle).

The NRC inspector completed a detailed review and evaluation of four procedures and the results of the licensee's reinspection efforts for skewed fillet welds. Procedures reviewed are listed below:

- QI-QAP-11.1-26, Revision 15, "ASME Pipe Fabrication and Installation Inspections and Requirements Prior to System/Subsystem N-5 Certification"
- QI-QAP-11.1-28, Revision 24, "Fabrication and Installation Inspection of Safety Class Component Supports"
- QI-QAP-11.21-1, Revision 6, "Requirements for Visual Weld Inspection"
- CP-QAP-16.1, Revision 20, "Control of Nonconforming Items"

The NRC inspector reviewed licensee/contractor records for 27 of the 640 supports with skewed fillet welds. The records were reviewed primarily for final as-built configuration and the results of the licensee's reinspection effort. The licensee originally committed to a reinspection of randomly selected skewed fillet welds with selection based upon statistical sampling techniques (reference: Inspection Report 50-445/82-14, paragraph 4). However, the licensee performed a 100% reinspection of the 640 affected supports with skewed fillet welds, rather than a randomly selected statistical technique. The NRC inspectors reviewed the licensee's drawings to determine the extent of inspection requirements for supports with skewed fillet welds. The NRC inspector's review and evaluation determined that the licensee's reinspection did not identify any skewed fillet welds that were undersized or otherwise did not meet appropriate requirements. No nonconformance reports (NCRs) were issued by the licensee or contractor during or as a result of the reinspection effort.

The NRC inspector performed visual inspection of the following Unit 1 supports and found no undersized skewed fillet welds:

RC-1-099-001-C86R	RC-1-101-002-C86K
RC-1-115-020-C66A	RC-1-115-025-C66K
DD-1-109-035-C46R	VD-1-148-001-C46R
SF-1-022-005-C46R	SF-X-135-700-A35R
CA-1-028-021-C46R	CH-1-005-005-C86R

No violations or deviations were identified.

(Closed) Severity Level IV Violation 445/8324-03 and 446/8315-03:  
Failure to Remove Obsolete Drawings from Construction Work Areas

The NRC inspector reviewed the improved process for reproducing drawings and determined that the new process results in an improved drawing, both in quality and legibility. The drawings reviewed are current and no out-of-date drawings were located in the work areas. The licensee's "Satellite" system for Unit 1 is complete and operational. This system is composed of four separate "Satellite" areas. The licensee is approximately 98% complete on a fifth "Satellite" area that is designated for Unit 2. From this review, the NRC inspector concluded that the four "Satellite" areas meet FSAR Section 17, paragraph 17.1.6 and B&R Procedure DCP-3, "CPSES Document Control Program," requirements.

The NRC inspector verified that the licensee's corrective actions as stated in their response dated June 28, 1983, have been adequately implemented.

4. 10 CFR 50.55(e) Report Followup and Evaluation

The NRC inspectors conducted a review of 26 licensee reported potential 10 CFR Part 50.55(e) packages. Of these 26 reports, 10 were found to not require a report (nonreportable) and the other 16 required the licensee to submit a report in accordance with 10 CFR Part 50.55(e) requirements. The licensee refers to 10 CFR 50.55(e) reports as "Significant Deficiency Analysis Reports" (SDARs). The licensee's SDARs were reviewed for content, compliance with NRC requirements for reporting, corrective actions, appropriate evaluation, timeliness of reporting, and completion of documentation. The following 26 CFR Part 50.55(e) reports (SDARs) and related licensee documentation were reviewed by the NRC inspectors, were found to meet the requirements, and were closed:

<u>50.55(e) or SDAR</u>	<u>Subject</u>	<u>Licensee Evaluation Reportable (R) or Not Reportable (NR)</u>	<u>Date Closed</u>	<u>Licensee Letter Number</u>
CP-81-01	Cellcote 658-N Epoxy Testing and Calculations for "Compressive Strength of Epoxy Grout"	NR	2/17/81	TXX3279
CP-82-A	Installed Borg Warner Valves (Containment Spray Valves)	R	3/18/82	TXX3495
CP-82-02	Design of Horizontal Fire Dampers	R	5/28/82	TXX3523
CP-82-06	Unit 2 Emergency Diesel (EDG) Generator Auxiliary Skid	R	1/10/84	TXX4095

<u>50.55(e) or SDAR</u>	<u>Subject</u>	<u>Licensee Evaluation Reportable (R) or Not Reportable (NR)</u>	<u>Date Closed</u>	<u>Licensee Letter Number</u>
CP-82-15	Defective Piston Skirt Castings for Unit 2 EDG	R	1/30/84	TXX4101
CP-83-01	Borg Warner Valves (check valves - disengaged parts)	R	9/7/83	TXX4043
CP-83-10	Letdown Heat Exchanger Anchors (mounting configuration)	R	7/7/83	TXX4001
CP-83-15	Cable Tray Clamps (mild steel bolting acceptable)	R	7/12/83	TXX4005
CP-83-17	Inadequate Overpressure Protection for Spent Fuel Pool Cooling Hx Components Cooling Water (relief valves incorrectly set)	R	8/9/83	TXX4023
CP-79-09	Installation of Major Conduit Supports Without Benefit of an Approved Instruction, Procedure or Drawing	R	8/6/80	TXX3173
CP-83-18	Containment Building Cooling (neutron detector well Reactor Cavity Cooling System)	R	9/26/83	TXX4054
CP-83-21	Transmitter Calibrations (excessive errors due to calibration techniques corrected)	R	12/28/83	TXX4091
CP-83-04	Potential Defect of Radiation Monitoring System	NR	2/28/83	TXX3635
CP-83-06	Vendor Installed HVAC System	R	7/29/83	TXX4016
CP-83-07	New Fuel Storage Racks	R	5/31/83	TXX3677

<u>50.55(e) or SDAR</u>	<u>Subject</u>	<u>Licensee Evaluation Reportable (R) or Not Reportable (NR)</u>	<u>Date Closed</u>	<u>Licensee Letter Number</u>
CP-83-08	Control Valve Brackets Unqualified Valve Attachments	R	4/21/83	TXX3657
CP-83-12	Class 1 Material Deficiencies (NDE specified was not performed)	NR	6/21/83	TXX3691
CP-83-13	Strut Jamming Devices (jam nuts on rigid struts)	NR	6/21/83	TXX36692
CP-83-14	(W) Loop Power Supply (NLP) Printed Circuit Cards - no cards of type with defects found at CP	NR	6/21/83	TXX3693
CP-83-16	Welded Attachments to Piping After Hydrostatic Testing	NR	7/20/83	TXX4012
CP-83-19	Service Water System Valves (safety function not adversely affected)	NR	10/17/83	TXX4064
CP-83-22	Chlorine Detection and Control Room HVAC (not per NRC Regulation and FSAR)	R	1/18/84	TXX4098
CP-84-07	Deficient Lug Crimping	R	3/29/84	TXX4139
CP-82-05	Concrete Void in Unit 1 Steam Generator Compart- ment #2 Exterior Wall	R	8/24/82	TXX3561
CP-82-01	Material Procured by AFCO Steel	NR	2/19/82	TXX3480
CP-82-08	Defective Limitorque Pinion Keys	NR	10/12/82	TXX3580

The above 10 CFR Part 50.55(e) reports are closed.

No violations or deviations were identified.

Selected NRC inspector observations of licensee reported items (10 CFR Part 50.55(e)) that the licensee is presently investigating or performing corrective action on are discussed below:

a. Rodent Damage to Class 1E Electrical and Control Cables

The licensee verbally reported damage to electrical and control cables between the Service Water Intake Structure (SWIS) and the safeguards building to the NRC and subsequently documented the information in SDAR CR-84-10.

The NRC inspectors observed portions of the licensee's inspection, corrective actions, and repulling of repaired cables or replacement of electrical and control cables at the SWIS and manholes MH 1A1 and MH 1A2 locations. The licensee removed all 28 cables (24 control cables and 4 instrumentation cables) in the Orange (A) Train. The licensee found considerable rodent damage to the insulation on several of these Instrument and Control (I&C) cables, and replaced each of the 28 I&C cables with new cable. The licensee pulled each of the nine 480V AC electrical cables out of the conduit and raceways; visual inspection identified some minor surface damage caused by rodents on two of these cables. The licensee repaired each surface damaged area and returned the cables to their original locations. The licensee performed visual inspections, meggered each of the 3 cables for the 6.9KV AC circuit, performed high voltage (hi-pot) testing on each cable, and determined that the 6.9KV circuit was satisfactory.

Licensee and NRC inspectors determined that the major rodent damage occurred near the junction of conduit C-130 01711 and junction box JBIM-2070 and between manhole E1A2 and E1A1 and safeguard cable A4009242A. Inspections of junction box JBIM-2060 and conduits C-12005538, C-1205539, and C-12001693 in the SWIS were also performed by the licensee and NRC inspectors.

The licensee issued the following NCRs as a result of the rodent damage to electrical and control cables in the Orange (A) Train:

E-84-00954, Rev. 3  
E-84-00962, Rev. 1  
E-84-00974, Rev. 2  
E-84-00975, Rev. 1  
E-84-01309, Rev. 0

Prior to reinstallation of the cables, each conduit was cleaned and no evidence of rodents was found. The licensee has completed replacement, repairs, repulling, and testing of the above cables. The licensee included the following preventive measures to assure the integrity of the cables:

- (1) All areas adjacent to manholes were baited with rat poison.
- (2) All conduit openings in the manholes are covered with temporary protective covering to preclude rodent entry. Permanent coverings are to be installed as specified in Design Change Authorization (DCA) 20397.
- (3) All conduit openings at the entrance or exit of the ductwork have been sealed with elastomer caulk or firestop foam.

The licensee investigated the Green (B) Train cables between the SWIS and the safeguards building to assure that the integrity of this train could be verified. The licensee personnel pulled oversized cloth swabs through each conduit. The NRC inspectors observed portions of this swabbing from both the SWIS and the manhole entrances. Possible rodent entry was identified in one conduit. The licensee removed the 28 (24 control and 4 instrumentation) cables from the ductwork as required by NCR E-84-01434.

The licensee inspected these cables and determined that two active cables and one spare cable had sustained minor damage. The licensee repaired the minor damage. The NRC inspectors observed portions of the inspection and repair in the Green (B) Train. The licensee reinstalled the 28 cables and initiated the preventive measures stated above for the Orange (A) Train.

No violations or deviations were identified.

b. Thermo-lag Installation

On May 2, 1984, the licensee verbally reported to the NRC, that contrary to CPSES construction procedures, construction debris in the form of scraps of thermo-lag material was found lying loose in electrical cable trays. The licensee subsequently documented this incident in SDAR CP-84-11. Prefabricated sections of thermo-lag material are being installed around electrical cable trays for fire protection. The strips of thermo-lag material had apparently been placed inside the cable trays to support the prefabricated sections of thermo-lag that were installed over the cable trays. When the problem was discovered, the licensee stopped the installation of the thermo-lag and evaluated the problem. The licensee's corrective action included the retraining of individuals involved in the installation of thermo-lag, the reinspection of cable trays 24 inches wide and larger that had already had the thermo-lag installed, and additional quality control inspection of cable trays immediately prior to sealing the prefabricated sections of thermo-lag.

No violation or deviations were identified.

5. Followup of Allegation Concerning Bolts for Steam Generator (SG) Upper Lateral Supports

An allegation was received in the Region IV office that some bolts holding the SG lateral supports to the wall plates had been cut off and, therefore, were incapable of securing the SG lateral supports to the imbedment plates in accordance with design requirements.

A review by the NRC inspector of the materials, drawings, specification, purchase orders, travellers, material received records, and related records documents indicated that the licensee purchased 144 A540GT B23 Class 4 2-1/2-inch diameter bolts 9 inches in length. The licensee purchased these 144 bolts 1-1/2 inches too long and then cut each of these bolts to 7-1/2-inch length to meet delivery and scheduling requirements. The rework (cutting 1-1/2 inches off the 9-inch length of each bolt) was authorized by the licensee and is documented in work package MRB-0550-013-RB.

The licensee did cut 1-1/2 inches off each bolt; therefore, in substance, this allegation was substantiated. However, there is no technical merit nor safety concern related to cutting 1-1/2 inches off the length of each bolt.

The original design required hex head bolts 7-1/2 inches in length and 2-1/2 inches in diameter.

The NRC inspector reviewed the following documents related to the above information:

- G&H Drawing 2323-17, Rev. 1
- AFCO Steel Drawing 303
- Purchase Order (PO) 35-1195-14915 C07
- Material Received Records (MRR) 060860, 61000, and 61150
- Material Test Reports (MTRs) for Charpy Impact, Tensile Strength, Chemical Analysis, Heat Treatment, and Magnaflux Testing
- Receiving Inspection Reports (RIR) 6008, 6256, and 6428

No violations or deviations were identified.

6. Preservice Inspection - Unit 1

A previous NRC inspection (50-445/82-19) reported witnessing of preservice ultrasonic inspection of Unit 1's reactor coolant system piping. It was noted in the above report that: (1) adequate penetration of the longitudinal wave was not achieved as evidenced by the sporadic loss of back reflection and (2) a full volumetric examination was not achieved as evidenced by the saturation of the cathode ray display screen such that

indications in the outer half of the pipe thickness could not be identified by the refracted longitudinal wave. A demonstration by Westinghouse was requested by the NRC Division of Licensing based on recently reported successful ultrasonic inspections at the Callaway and Wolf Creek sites. The demonstration was requested to establish if these improvements in the ultrasonic testing instrumentation could result in a successful ultrasonic inspection at CPSES, Unit 1.

On March 20 and 21, 1984, the confirmatory demonstration ultrasonic inspection was performed at CPSES, Unit 1 by Westinghouse. The demonstration was witnessed by NRC inspectors and their consultants (Oak Ridge and Pacific Northwest Labs). The inspection was performed by Westinghouse Level II and III personnel (qualified to SNT-TC-1A) to Procedure ISI-206, Revision 0, "Manual Ultrasonic Examination of Welds." The demonstration included a longitudinal wave and a refracted (41 degrees) longitudinal wave of weld joint numbered 13 on Isometric Drawing TBX-1-4200 of Unit 1 and several weld joints; i.e., 27 and 29 of Unit 2.

The demonstration confirmed the previous NRC observations in regard to Unit 1. On weld number 13, only a sporadic back reflection could be achieved from the longitudinal wave. With the refracted longitudinal wave, considerable saturation was observed, approximately one-half the material thickness. On Unit 2, a consistent back reflection from the longitudinal wave was observed which indicated adequate penetration. After searching for a counter bore on the inside diameter of four different joints, one joint was found which consistently showed the counterbore by the refracted longitudinal wave. The saturation of the screen was less however, about 1/4 of the thickness near the outside diameter still could not be inspected. It was noted that the procedure, equipment, and some of the personnel were the same as previously used in the 1982 preservice inspection.

The differences found between Units 1 and 2 could be accounted for by the observed differences in surface finish condition and preservice inspection weld preparation. The chemical composition of the heats, grain size, and other geometrical factors could not be visually determined, but could have been significant contributors to the ultrasonic differences observed during the demonstration.

#### 7. Plant Tours

At various times during the inspection period, the NRC inspector conducted general tours of the reactor building, 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.

8. Inspection and Enforcement Bulletin (IEB) Followup

The NRC inspector reviewed the licensee's IEB files for selected IEBs to verify that the licensee had conducted an adequate review of each IEB to determine its applicability to the CPSES facility and that the licensee had taken appropriate action when the IEB was applicable. Through discussions with licensee representatives and reviewing records, the NRC inspector was able to determine that the licensee had satisfactorily responded to the IEBs listed below. These IEBs are closed.

<u>IEB No.</u>	<u>Title</u>	<u>Licensee Closure Letter No./Date</u>
78-05	Malfunctions of Circuit Breaker Auxiliary Contact Mechanism Model CR 105X	TXX2908/11-16-78
78-06	Defective Cutler Hammer, Type M Relays with DC Coils	TXX2959/02-19-79 TXX2869/08-04-78
78-10	Bergen-Patterson Hydraulic Shock Suppressor Accumulator Spring Coils	TXX2894/10-19-78
79-03 and 79-03A	Longitudinal Weld Defects in ASME SA-312 Type 30455 Pipe Spools Mfg. by Youngstown Welding and Engineering Co.	TXX2983/05-01-79 TXX3204/10-07-80
79-04	Incorrect Weights for Swing Check Valves Manufactured by Velan Engineering Co.	TXX3000/06-14-79 TXX2989/05-23-79
79-09	Failures of G.E. Type AK-2 Circuit Breakers in Safety-Related Systems	TXX2988/05-22-79
79-11	Faulty Overcurrent Trip Device in Circuit Breakers for Engineered Safety Systems	TXX3013/07-16-79
79-23	Potential Failure of Emergency DG Field Exciter Transformer	TXX3056/10-17-79
79-25	Failures of Westinghouse BFD Relays in Safety Related Systems	TXX3191/09-08-80

<u>IEB No.</u>	<u>Title</u>	<u>Licensee Closure Letter No./Date</u>
80-16	Potential Misapplication of Rosemount, Inc. Models 1151 and 1152 Pressure Transmitters with "A" or "D" Output Codes	TXX3172/08-08-80
80-21	Valve Yokes Supplied by Malcolm Foundry Co., Inc.	TXX3250/12-22-80
80-23	Failures of Solenoid Valves Manufactured by Valcor Engineering Corp.	TXX3246/12-17-80
80-19	Failures of Mercury-Wetted Matrix Relays in Reactor Protective Systems of Operating Nuclear Power Plants Designed by CE	TXX3189/09-08-80
80-04	Deficiencies in Primary Containment Electrical Penetration Assemblies	TXX36687/06-14-83

NRC inspector observations of activities related to IEB 82-04 are discussed below:

IEB 82-04 licensee action item 1.a required the licensee to inspect all supplier provided electrical penetration terminal boxes and verify that the conductor terminations were satisfactory. The licensee determined that there were 4 supplier provided penetrations (IE80, IE81, 2E80, and 2E81) with attached terminal boxes involved each with 8 terminations for a total of 32 terminations. Due to the small number of terminations involved, the licensee replaced all 32 lugs in these boxes which had previously been terminated by the supplier.

IEB 82-04 licensee action item 1.b required the licensee to inspect electrical penetration conductors as they enter and exit penetration modules and verify the integrity of the insulation around the conductors. The licensee inspected all of the accessible conductors on safety-related penetrations for Units 1 and 2. At the time of the licensee's inspection, the Unit 2 safety-related penetrations were stored in a warehouse and the Unit 1 safety-related penetrations were installed in the plant. The licensee's inspection included all of the Unit 2

safety-related penetration conductors and all of the Unit 1 safety-related penetration conductors where these penetration conductors enter/exit the penetration modules on the reactor building end of the penetrations. The licensee's inspection verified the integrity of the insulation around the conductors. The Unit 1 penetration conductors on the end of the penetration located outside of the reactor building were not accessible. The licensee's inspections were documented by quality control personnel.

IEB 82-04 licensee action item 1.c required the licensee to conduct detailed examinations of all supplier-provided in-line butt splices having a wire size of #2 AWG and smaller, and to ascertain acceptability of these connections. The licensee inspected a random sample of the vendor provided in-line butt splices. The sample size was a minimum of 25% of the total number of vendor supplied in-line butt splices for each size conductor. In addition to the inspection of butt splices, the licensee selected a 10% random sample of the in-line butt splices, inspected and performed a pull test on them. The in-line butt splices for all wire sizes except #2 AWG passed the pull test. Due to the failure of the #2 AWG conductor in-line butt splices to pass the pull test, the licensee is replacing all #2 AWG in-line butt splices on safety-related penetrations.

The NRC inspector performed the following inspection activities to verify that the licensee's response and corrective action fulfilled the requirements of IEB 82-04:

- a. Reviewed the licensee's sample size and found that it met or exceeded the minimum required by Section 2.b of IEB 82-04.
- b. Reviewed licensee's documentation and connector vendor (Amp Incorporated) catalogs.
- c. Inspected a random sample of licensee installed connectors and verified that the connectors were installed properly. The connectors and crimping tool were as specified by the connector vendor. The crimping tool was calibrated (the calibration included the performance of a pull test on a similarly installed sample connection).
- d. Inspected the conductor insulation of a random sample of conductors at the point where the conductors exited/entered the epoxy of the penetration feed thru modules.

Selected portions of the accessible conductors on the safety-related penetrations listed below were inspected:

- Unit 1 (penetrations installed) IE6, IE9, IE10, IE11, IE12, IE13, IE15, IE16, IE17, IE47, IE39, IE56, IE60, IE64, IE62, AND IE63.

- Unit 2 (penetrations stored in warehouse) 2E12, 2E13, 2E18, 2E40, 2E56, 2E57, 2E58, 2E59, 2E62, 2E64, 2E76, 2E77, 2E78, 2E79, 2E80, AND 2E81.

Selected NRC inspector findings are discussed below:

- a. In attachment 2 to enclosure 1 of licensee's response letter TXX-3687 dated June 14, 1983, the licensee incorrectly listed penetrations 2E78 and 2E79 as the penetrations inspected for #12 AWG conductors. The penetrations actually inspected were 2E76 and 2E77 and the licensee's documentation confirm these inspections.
- b. During the manufacturing process, a piece of sleeving was placed over some of the conductors on the section of conductor that is embedded in epoxy. This sleeving extends approximately 2" on either side of the epoxy. This sleeving in some cases is cracked at the juncture of the sleeving and the epoxy. The conductor insulation inside the sleeving was intact in all except one instance observed by the NRC inspector. This instance was on conductor E3 of penetration IE10. This conductor had insulation damage; however, this damaged conductor had been identified by the licensee, and the licensee had issued revision 4 to sheet 10A of drawing 2323-EI-0511 which classified this lead and two adjacent leads as damaged.
- c. During the licensee's inspection of the in-line butt splices, the licensee found that the vendor had failed to crimp one end of a splicing lug on lead E6 of penetration 2E-58. This condition was documented on licensee's traveler No. EE83-0136-9301 and corrective action (splicing lug to be replaced) delineated on nonconformance report E83-00424. This failure of the vendor to crimp the lug was not interpreted by the cognizant licensee representative as being an under crimped condition and, therefore, this instance was not identified in the licensee's response to IEB 82-04. The licensee inspected 424 conductor splices and this is the only crimp that was identified as not being made. The Unit 1 penetrations are installed with most of the related work being completed on them. The NRC inspector did not find any evidence of conductor deterioration or damages that would make the integrity of the Unit 1 penetrations questionable.

The licensee is still performing work on the Unit 2 penetrations. Some of the work being performed is restoration from the inspection, testing, and corrective action related to IEB 82-04. The NRC inspector will monitor selected portions of this work and also the installation of these penetrations.

9. 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 licensee acknowledged the NRC inspectors' statements.