APPENDIX B

U. S. NUCLEAR REGULATORY COMMISSION

OFFICE OF NUCLEAR REACTOR REGULATION

NRC Inspection Report: 50-445/89-84
50-446/89-84

Permits: CPPR-126
CPPR-127

Dockets: 50-445
50-446

Construction Permit
Expiration Dates:
Unit 1: August 1, 1991
Unit 2: August 1, 1992

Applicant: TU Electric
Skyway Tower
400 North Olive Street
Lock Box 81
Dallas, Texas 75201

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

Inspection At: Comanche Peak Site, Glen Rose, Texas

Inspection Conducted: November 8 through December 5, 1989

Inspector: R. M. Latta — 21 Dec 89
R. M. Latta, Resident Inspector (Electrical) (paragraphs 2, 3, 4, 5, 6, 7, 8, 9 and 10) — Date

Consultants: J. L. Birmingham, RTS (paragraph 3)
W. D. Richins, Parameter (paragraph 7)
J. L. Taylor, Parameter (paragraphs 3, 4, 6 and 8)

Reviewed by: RF Warnick for — 12/21/89
H. H. Livermore, Lead Senior Inspector — Date

Inspection Summary:

Inspection Conducted: November 8 through December 5 1989 (Report 50-445/89-84; 50-446/89-84)

Areas Inspected: Unannounced, resident safety inspection of the applicant's actions on previous inspection findings; 10 CFR 50.55(e) deficiencies identified by the applicant; NRC Bulletins; allegation follow up; electrical components and systems; safety-related mechanical components; and plant tours.

Results: Within the areas inspected, a weakness was identified in the applicant's work order and deficiency documentation program. Specifically, this weakness involved the applicant's failure to perform a reportability review of a discrepant condition associated with a cable support on penetration E-76 (paragraph 6). Additionally, a violation was identified which involved the failure to follow procedures in that the above mentioned cable grip was not in accordance with the design configuration established in Design Change Authorization (DCA) 59365 (paragraph 6).

Two open items were also identified. The first open item concerned the applicant's proposed revision of the Unit 2 electrical specification to incorporate appropriate provisions for the installation and mechanical protection of Kapton insulated conductors associated with Conax penetration configurations (paragraph 5.a). The second open item involved the applicant's Quality Control program implementation as it relates to the receipt inspection of vendor supplied Thermolag and the identification and documentation of deficiencies for this material (paragraph 5.c).

DETAILS

1. Persons Contacted

*J. L. Barker, Manager, ISEG, TU Electric
*D. P. Barry, Senior, Manager, Engineering, Stone and Webster Engineering Corporation (SWEC)
*J. W. Beck, Vice President, Nuclear Engineering, TU Electric
*O. Bhatty, Issue Interface Coordinator, TU Electric
*M. R. Blevins, Manager of Nuclear Operations Support, TU Electric
*H. D. Bruner, Senior Vice President, TU Electric
*W. J. Cahill, Executive Vice President, Nuclear, TU Electric
*H. M. Carmichael, Senior Quality Assurance (QA) Program Manager, CECO
*W. G. Counsil, Vice Chairman, Nuclear, TU Electric
*C. G. Creamer, Manager, Unit 1 Completions Engineering, TU Electric
*B. S. Dacko, Licensing Engineer, TU Electric
*D. E. Deviney, Deputy Director, QA, TU Electric
*F. Dunham, QA Issue Interface, TU Electric
*C. A. Fonseca, Deputy Director, CECO
*S. P. Frantz, Newman and Holtzinger
*J. L. French, Independent Advisory Group
*W. G. Guldemond, Manager of Site Licensing, TU Electric
*D. L. Heatherly, Licensing Compliance Engineer, TU Electric
*J. C. Hicks, Licensing Compliance Manager, TU Electric
*C. B. Hogg, Chief Engineer, TU Electric
*A. Husain, Director, Reactor Engineering, TU Electric
*J. J. Kelley, Plant Manager, TU Electric
*J. E. Krechting, Director of Technical Interface, TU Electric
*J. L. LaMarca, Manager of Electrical and T & C Engineering, TU Electric
*O. W. Lowe, Director of Engineering, TU Electric
*F. W. Madden, Mechanical Engineering Manager, TU Electric
*D. M. McAfee, Manager, QA, TU Electric
*S. G. McBee, NRC Interface, TU Electric
*J. W. Muffett, Manager of Project Engineering, TU Electric
*E. F. Ottney, Program Manager, CASE
*S. S. Palmer, Project Manager, TU Electric
*C. A. Parker, TU Electric
*P. Raysircar, Deputy Director/Senior Engineer Manager, CECO
*D. M. Reynerson, Director of Construction, TU Electric
*H. C. Schmidt, Director of Nuclear Services, General Division, TU Electric
*A. B. Scott, Vice President, Nuclear Operations, TU Electric
*J. C. Smith, Plant Operations Staff, TU Electric
*R. L. Spence, TU/QA Senior Advisor, TU Electric
*P. B. Stevens, Manager of Operations Support Engineering, TU Electric
*J. F. Streeter, Director, QA, TU Electric

*C. L. Terry, Manager of Projects, TU Electric
*O. L. Thero, QTC Consultant to CASE
*R. G. Withrow, EA Manager, TU Electric
*D. R. Woodlan, Docket Licensing Manager, TU Electric
*J. E. Woods, Assistant Project Engineer, SWEC/CECO

The NRC inspectors also interviewed other applicant employees during this inspection period.

*Denotes personnel present at the December 5, 1989, exit meeting.

2. Applicant's Action on Previous Inspection Findings (92701)

a. (Closed) Open Item (445/8908-O-01): The documentation file relating to the auxiliary feedwater (AFW) motor fans, which were installed backwards, contained two nonconformance reports (NCRs) which were not previously reviewed by the NRC. These NCRs described arcing between the fans and the brass rings on the rotor winding. Specifically, the arcing process was attributed to the reversed configuration of the fans. As stated in the Westinghouse analysis, which was included in the applicant's documentation, the reversed fans would not have resulted in the failure of the motor and this condition would not have reduced the level of safety for these components during operation. However, it was not evident that the subject Westinghouse analysis considered all of the pertinent conditions identified in the NCRs.

During a subsequent meeting with the NRC inspectors, TU Electric provided additional information. In particular, it was determined that Westinghouse had reevaluated the impact of the reported NCR conditions as related to the issue of the reversed fan and had concluded that their original analysis was not affected. In that the NRC inspector's technical concerns were adequately addressed by the applicant, this item is closed.

Note: In NRC Inspection Report 50-445/89-08; 50-446/89-08 the tracking number identified for this item contained a typographical error. The number shown above (445/8908-O-01) corrects the number error (445/8808-O-01).

b. (Closed) Open Item (445/8908-O-03): This open item identified the absence of appropriate deficiency documentation pertaining to the stripped threads in the bearing holes for an AFW motor. The NRC inspector subsequently confirmed that operations/maintenance had issued NCR 88-03638, Revision 0, which adequately documented this condition. Therefore, this item is closed.

c. (Closed) Open Item (445/8908-O-04): This open item identified concerns relative to the adequacy of temperature control verification by Quality Control (QC) during the welding process on the AFW rotor bar assembly. Specifically, the controlling maintenance instruction stated that extreme caution must be taken not to concentrate an excessive amount of heat on the rotor bar assembly during welding. The NRC inspector identified a concern that QC had not verified that this instruction was adhered to.

Subsequently, TU Electric personnel met with the NRC on two separate occasions to provide additional information about this concern. During the second meeting, TU Electric indicated that an electrical engineer had inserted the caution about heat input. Additionally, a welding specialist identified the material as a low carbon steel and provided information regarding the energy input. Based on the supplemental information provided by the applicant, the identified concerns were adequately addressed. Therefore, this item is closed.

d. (Closed) Open Item (445/8973-O-05): Documentation for the failure of check valve 1MS-142 in 1985. This item was identified during the NRC Augmented Inspection Team evaluation of multiple check valve failures experienced during the April - May, 1989, hot functional testing. In particular, the applicant's Failure Analysis Report FA 85-001, Revision 0, had correctly identified the root cause of the failure of valve 1MS-142 as the valve bonnet and retainer ring being incorrectly placed too low in the valve body. Subsequent to contacting the supplier, Borg-Warner, the applicant revised the root cause stated in FA 85-001, replaced the valve disc and shortened the disc stud to reduce axial play. The applicant concluded that valve internals were correctly installed and that the root cause was actually unanticipated system transients as evidenced by failed system snubbers. The revised response was supported by analytical documentation regarding cold start system loads and vendor information pertaining to a similar incident at another nuclear facility. Apparently, no documentation of the applicant's discussion with Borg-Warner exists.

The NRC inspector examined the applicant's supplementary documentation regarding the revised engineering decision. This documentation included a review of correspondence from maintenance engineering to licensing contained in TU Electric's memo TCF-891587 and TCF-891627 as well as Problem Report 85-297, Failure Analysis Report FA 85-005, and Test Deficiency Report CP-SAP-16. The NRC inspector concluded that as a result of not following up on the

initially identified cause of this precursor event, the applicant failed to take adequate corrective action and similar valve failures due to improper bonnet retainer installation occurred in 1989. This issue is addressed by violation 445/8930-V-02, part B.1. Therefore, this open item is closed.

3. Action on 10 CFR Part 50.55(e) Deficiencies Identified by the Applicant (92700)

a. (Closed - Unit 1 only) Construction Deficiency (SDAR CP-87-21): "Effect of Thermolag on Derating Factors." This reportable deficiency involved the applicant's evaluations of thermolag derating factors which determined that the previously assumed value of 10% used on internal cable sizing calculations was nonconservative. Specifically, the derating factors of 31% for single trays and 20% for single conduits enclosed in thermolag were established.

As described in the applicant's interim report contained in TU Electric's letter TXX-7041, the failure to consider the increased derating of power cables due to thermolag installation could have caused the subject cables to exceed their design temperature rating resulting in the indeterminate status of associated Class 1E circuits. This condition reportedly was the result of evaluations performed by the vendor which altered the previously accepted cable derating factors.

The applicant's corrective actions included the identification of cables which would have exceeded the prescribed ampacity rating due to the thermolag and to either remove the thermolag from the raceways or increase the cable size. Additionally, the applicant revised the applicable Design Basis Document (DBD)-EE-052, "Cable Philosophy and Sizing Criteria," to establish the design considerations for cable ampacity derating.

The NRC inspector reviewed the results of the Consolidated Engineering Contractor Organization (CECO) response to this issue contained in CECO letter 1318 dated June 21, 1989. The actions documented in this letter included: the completion of design validation of all installed cables, the identification of cables which did not comply with DBD-EE-052, and a listing of the documents which implemented the corrective actions.

Based on the above inspection activities which included a review of a representative sample of the design change authorizations (DCAs) identified in the reference CECO correspondence, an examination of the controlling

DBD-EE-52 and inspections of electrical raceway installations, the NRC inspector concluded that the applicant's actions to correct this construction deficiency for Unit 1 were adequate. However, pending the implementation of similar corrective actions for Unit 2, this item is closed for Unit 1 only.

b. (Closed - Unit 1 only) Construction Deficiency (SDAR CP-87-079): "Cable and Raceway Data Systems (CARDs) Calculations." By letter TXX-6779 dated September 28, 1987, the applicant notified the NRC of a deficiency concerning the process for calculating percent fill and cable weight loading. The process for calculating percent cable fill and cable weight loading is identified as the Cable and Raceway Data System (CARDS). In part, CARDS is dependent on an accurate description of the point or node at which a cable enters and exits a raceway as prescribed by the cable pull card. However, due to a nonprescriptive interpretation of Specification 2323-E1-1700 and Inspection Procedure QI-QP-11.3-26, the range of field installation included the cable tray segments on either side of the cable tray node specified on the cable pull card. This range or tolerance in the field installation brought about the inaccuracy of the cable tray percent fill and cable weight loading values calculated by the CARDS process. This issue was discovered during a CARDS report analysis and confirmed by field investigation.

Subsequent to the determination that this issue was reportable, the applicant initiated both corrective and preventive actions. Specifically, the applicant performed an impact study of CARDS to identify the population of cable trays requiring additional analysis. This analysis was performed in accordance with Procedure ECS-5.01-15. Also, a software program was developed and incorporated into CARDS to calculate the maximum weight of individual tray sections. The software program was designed to calculate the percent fill and cable weight assuming the cables were installed to the full range used for field installation.

The NRC inspector reviewed the above information and determined that the applicant had developed satisfactory corrective and preventive actions. The evaluation of percent fill and cable weight loading for Unit 1 is over 90% complete. The completion of the evaluation and correction of any discrepancies is committed to be complete for Unit 1 prior to fuel load. The commitment for Unit 1 is being tracked by the applicant's commitment tracking system. However, pending the implementation of similar corrective actions for Unit 2, this item is closed for Unit 1 only.

c. (Closed - Unit 1 only) Construction Deficiency (SDAR CP-87-134): "Class 1E AC Electrical Systems." Deficiencies identified during the applicant's review and design validation process of calculations associated with the Class 1E AC electrical power distribution system involved several aspects. Specifically, these deficiencies included incorrect: cable ampacity ratings, voltage ratings, circuit breaker sizings, and cable separation criteria. As stated in the applicant's final response to this issue contained in TU Electric's letter TXX-88064 dated January 11, 1988, these inadequacies represented significant design deficiencies from the approved and constructed design criteria stated in the Final Safety Analysis Report.

The applicant's corrective actions as delineated in CECO letter 0462 dated March 21, 1989, included the basis for the loading calculations that affected cable and circuit breaker sizing for those items not requiring rework. Additionally, this correspondence identified the correcting DCAs which altered or rerouted the subject cables, modified the circuit breakers, or changed trip settings.

The NRC inspector reviewed the following documents and verified that the appropriate revisions had been implemented.

(1) Design Basis Documents: -051, Protection Philosophy

-052, Cable Philosophy and Sizing Criteria

-057, Separation Criteria.

(2) Calculations:

16345/6 EE(B)-004, Cable Ampacity Derating Factors for Conduits

-008, Boxed in Thermolag (TSI product)

-009, Sizing of Class 1E 480V.MCC Branch Feeder Cables

-010, Cable Sizing Calculations - 480V. System

-011, Validation of Cable Sizing Calculations - DC System for Class 1E Cables Based on Voltage Drop and Ampacities

-027, Cable Sizing Calculations - AC System Below 480V

Additionally, the NRC inspector reviewed the following DCAs and nonconformance reports (NCRs) for corrective actions based on the above documentation.

DCAs: 21896, 32872, 38005, 46572, 65618, 65620, 71690, 73129, 73740, 73817, 74180, 74197, 75006, 75046, 75057, 75928, 76054, 76704, 76819, 77779, 79521, 79974, 79973, 79978 of 34 DCAs issued.

NCRs: 87-2444, 88-01885, 88-41884

The NRC inspector verified the implementation of the above changes by performing a review of approximately 10% of the completed items including: breaker resizing in panels 1EC3-2, 1EC4-2, and LP-ESB1 and trays T12G0040 and T12G-00471; and percent fill status for cable EG105701. Based on the above documentation reviews and inspection activities, the NRC inspector determined that the applicant's corrective actions which were essentially complete along with the established programmatic controls appear to be adequate for Unit 1 activities. However, pending the implementation of similar corrective actions for Unit 2, this construction deficiency is closed for Unit 1 only.

d. (Closed - Unit 1 only) Construction Deficiency (SDAR CP-89-07): "Defective Rosemount 1153 and 1154 Transmitters." On March 20, 1989, TU Electric notified the NRC Resident office of a potential deficiency involving Rosemount transmitter models 1153 and 1154. Specifically, on February 7, 1989, Rosemount, Inc., notified TU Electric, pursuant to 10 CFR Part 21, of the potential failures of transmitter sensing modules resulting from the loss of internal fill fluid. This issue was also the subject of NRC Information Notice 89-42, "Failure of Rosemount Models 1153 and 1154." The applicant's final response to this issue, for Unit 1, is contained in TU Electric's letter TXX-89666 dated November 13, 1989. This response provided TU Electric's basis for determining the nonreportability of this issue and identified the systems and applications for Rosemount Model 1153 and 1154 transmitters at Comanche Peak.

The applicant's response to this issue appeared to be thorough in that their review of Unit 1 applications of Rosemount Models 1153 and 1154 included all transmitters that are utilized in Class 1E or accident monitoring applications. As stated in the applicant's response, a total of 78 transmitters were identified, of which 34 were Class 1E units that did not serve an accident monitoring function nor did they provide a primary input to an automatic reactor trip signal or an engineered safety features actuation signal. For the remaining 44 transmitters which were utilized in an accident monitoring application, the applicant's analysis concluded that the existing design which incorporates diversity and redundancy coupled with a low frequency of transmitter failures is acceptable and that a condition adverse to the safety of plant operations would not develop.

The NRC inspector reviewed the associated documentation including the 10 CFR Part 21 notification from Rosemount to TU Electric and the vendor's supplemental correspondence dated May 10, 1989, and September 8, 1989. The NRC inspector also reviewed attachment 1 of the subject construction deficiency which provided an analysis/justification of the existing programs relative to the control and maintenance of Rosemount transmitters which include routine surveillances, calibration, and operating practices. These reviews indicated that the applicant had evaluated the impact of the potentially defective transmitters on operating parameters and that the programs in place to prevent an adverse result on plant operations appeared adequate. Accordingly, this construction deficiency is closed for Unit 1 only.

4. <u>NRC Bulletins (25573, 92703)</u>

a. (Closed) NRC IE Bulletin 85-03: "Motor-Operated Valve Common Mode Failures During Plant Transients Due to Improper Switch Settings." Issued in November 1985, this bulletin required the applicant to review and document the design basis for operation of specific motor operated valves (MOVs) in certain safety-related systems including the establishment of correct switch settings, the implementation of proper switch settings, and the development of procedures to ensure the correct settings were maintained throughout the life of the plant. The applicant's initial response to this issue was provided by letter TXX-4901 dated July 14, 1986. Subsequently, the NRC staff requested additional information which was submitted by letter TXX-88381 on April 8, 1988. As documented in an NRC memorandum to C. Grimes from C. H. Berlinger dated July 21, 1988, the staff accepted

the applicant's programmatic response to IEB 85-03 on July 7, 1988.

NRC Generic Letter 89-10 dated June 28, 1989, extended the bulletin requirements to include all safety-related MOVs and position changeable MOVs in safety-related systems. Completion of these requirements was established for 5 years from the date of the generic letter which also requires notification to the NRC within 6 months (to December 28, 1989) that the above schedule and recommendations will be met.

As part of the construction inspection process and as directed by Temporary Instruction 2515/73, the NRC inspector observed static testing of 3 of the 36 MOVs designated per IEB 85-03 requirements. Additionally, the NRC inspector observed the dynamic testing of valve 1HV2493A as previously documented in NRC Inspection Report 50-445/89-71; 50-446/89-71 and reviewed the valve testing data (signatures) for this valve and five other dynamic tests. Testing personnel were observed to be knowledgeable of test requirements and capable of performing all aspects of the testing program. The NRC inspectors review of the test data indicated the subject valves met the design criteria.

During the conduct of the testing program, some discrepancies were identified as documented in NRC Inspection Report 50-445/89-73; 50-446/89-73 on valve operator spring pack designations and on the operability of some valves. However, the applicant's existing programs appeared adequate to detect, document, and resolve these discrepancies. Additionally, the NRC inspector observed that the work order system and maintenance procedures appear to be adequate to require post-maintenance testing and establish the continuation of proper switch settings. One unresolved item was previously identified by NRC inspectors regarding the maximum operating differential pressure across the centrifugal charging pump safety injection isolation valves 1-8801A and 1-8801B. This issue is being administratively tracked by Item 445/8959-U-01. Based on the above programmatic reviews and inspection activities, this bulletin is closed for Unit 1.

b. (Closed) NRC Bulletin 88-10: "Nonconforming Molded-Case Circuit Breakers." NRC Bulletin 88-10 was issued on November 22, 1988, to request that addressees take actions to provide reasonable assurance that molded-case circuit breakers (MCCB) purchased for use in safety-related applications perform their safety functions. In addition, the bulletin required that the addressee submit certain

information to the NRC regarding MCCBs that could not be traced to the circuit breaker manufacturer (CBM). TU Electric provided its response to this issue by letter TXX-89160 dated March 31, 1989.

An NRC staff review of the written reports submitted by the addressee in accordance with Bulletin 88-10 revealed several common deficiencies. In addition, the NRC staff received requests for positions on specific issues that were not explicitly addressed in Bulletin 88-10. The NRC analyses and positions on these issues were provided in Supplement 1 to Bulletin 88-10 dated August 3, 1989. Specifically, this supplement requested that licensees and construction permit holders review their responses to the bulletin and verify that these responses complied with the provisions of the bulletin as clarified by the supplement. TU Electric summarized their efforts to obtain traceability for MCCBs by letter TXX-89640 dated September 8, 1989.

As established in the applicant's initial response to this issue, 706 of the 731 MCCBs stored as spares were traceable to their circuit breaker manufacturers. This response also indicated that traceability for the remaining 25 circuit breakers would be pursued by an equipment vendor audit or by other appropriate means. Subsequent investigation established traceability for 11 of the breakers (3-ELGAR, 1-ASEA Brown Boveri, 2-IMO Delaval and 5-Power Conversion Products). Documentation reviews of the other 14 MCCBs revealed that these MCCBs had been downgraded to a nonsafety-related status because their Class 1E applications had been eliminated. As stated in TU Electric's letter TXX-89640, these stored breakers (1-PCP and 13-ASEA Brown Boveri) will be addressed as part of the NUMARC initiative concerning nonsafety-related MCCBs.

Subsequent to submission of TXX-89160, TU Electric identified 30 additional MCCBs within the scope of the bulletin during an effort to validate the initial results. Adequate traceability was obtained for 29 of these breakers. Documentation of traceability for the remaining breaker which was purchased from Watson Electric was not available. An installed Watson Electric MCCB procured under the same purchase order as the stored breaker was subsequently identified. A review of procurement documents for MCCBs purchased from Watson Electric between August 1, 1983, and August 1, 1989, identified no additional breakers. As stated by the applicant, the installed Watson Electric breaker will be replaced with a traceable breaker by Unit 1 fuel load and both MCCBs will

be segregated and placed on hold for one year for possible evaluation.

As identified by the applicant, the total number of traceable MCCBs stored as spares for safety-related applications is currently 746. Another 14 breakers were downgraded to a non-Class 1E status because their safety applications had been eliminated. One additional stored breaker was identified which was not traceable.

In order to determine the effectiveness of the applicant's program pertaining to the control of stored Class 1E MCCBs and to verify the traceability of these items, the NRC inspector reviewed the records which provided proof of procurement from the circuit breaker manufacturers. This review included the detailed evaluation of the traceability from the associated purchase orders and intended use to the component part numbers to the manufacturer. Where applicable, the certificate of compliance, receiving inspection reports, and relevant procurement information were reviewed.

Based on a review of the above documentation, the NRC inspector determined that the applicant had developed an adequate methodology for the identification of Class 1E MCCBs currently stored on site and that these components are traceable to the circuit breaker manufacturers. Furthermore, for those MCCBs which did not have the required traceability, the applicant's program prevents their use in Class 1E applications; therefore, this item is closed for Unit 1.

No violations or deviations were identified.

5. Allegation Follow-up (99014, 51053, 51055)

a. (Closed) Allegation (OSP-88-A-0053): As previously documented in NRC Inspection Reports 50-445/89-04; 50-446/89-04 and 50-445/89-73; 50-446/89-73, this allegation concerned questionable installation practices utilized on Conax electrical penetrations. These penetrations contained Kapton insulated wiring in various conductor sizes. Specifically, the issues were that installation practices violated the specified minimum bend radius requirements during the arrangement of conductors in the cable trays and that inappropriate care was exercised in the installation process to protect the conductors from damage. Also, concern was expressed relative to the applicant's practice of bundling the conductors together and tie wrapping them to the lateral supports in the bottom of the cable trays in that plant induced vibration could then result in chaffing of the

Kapton insulation. This chaffing could result in a direct short, thus affecting both control and instrumentation functions. Although these concerns were identified in Unit 2, they have generic implications for Unit 1 penetrations which also utilize Conax penetrations with Kapton insulated conductors.

The evaluations conducted by the NRC inspectors and documented in the referenced inspection reports indicated that the applicant had adequately addressed the potential design concerns relative to the functional adequacy of installed Kapton insulated Class 1E equipment. Additionally, the applicant had identified all applications of Kapton insulation at CPSES and did not plan any further action in regard to redesign or replacement of Kapton. The allegation relative to the installation deficiencies remained open pending completion of detailed inspections to be performed by TU Electric in accordance with Electrical Specification ES-100 prior to the installation of cable tray covers in the penetration areas.

During this reporting period, the applicant completed their cable inspection program which included the evaluation of both safety-related and nonsafety-related Kapton insulated penetration termination configurations. The NRC inspectors witnessed approximately one-half of these inspections conducted on the population of 154 penetrations located in the reactor building, safeguards building, and fuel building. These activities were judged to be generally acceptable in that the craft and QC personnel involved appeared to be knowledgeable of the cleaning, inspection, and preservation requirements associated with this effort. Furthermore, when deficient or questionable configurations were identified by the applicant's staff, they correctly documented these discrepancies on NCRs. A representative sample of these NCRs were reviewed for acceptability along with the implementing DCAs. These reviews revealed that the applicant's actions relative to identifying discrepant conditions and rectifying these items appeared to be well controlled and effectively implemented. However, as previously identified in Inspection Report 50-445/89-73; 50-446/89-73 and documented in NCR 89-10399, several Kapton insulated conductors associated with a containment penetration (E-18) were potentially damaged when they were inadvertently grounded to a cross brace in a junction box. Subsequent evaluations performed by the applicant in conjunction with the supplier (Conax) on the removed sections of the five effected conductors revealed that only one conductor had experienced a breakdown of the Kapton insulation and that an adjacent conductor had received a minor spark burn on the outer layer of Kapton

from the arcing process. The remaining adjacent conductors were determined to have a carbon char residue which was easily removed from the apparently undamaged outer layer of insulations.

Testing performed by the applicant revealed that the four conductors adjacent to the damaged wire would have performed satisfactorily. However, it is noted that all five conductors have been removed and that the corresponding field cables have been respliced. The applicant's analysis concluded that the phenomenon associated with Kapton insulated conductors utilized in aircraft which is characterized as "arc tracking" did not occur in this incident.

Based on the above reviews and inspection related activities, the NRC inspector confirmed the allegation that previous installation practices did not properly emphasize the sensitivity of these conductors to physical damage. However, the concern that the minimum bend radius had been violated during the installation process could not be substantiated. Additionally, the concern that Kapton insulated conductors could be damaged by chaffing was adequately addressed by the applicant in that Electrical Specification ES-100 for Unit 1 was revised to eliminate this practice and to provide protective lining (Siltemp) in the bottom and sides of the cable trays.

In conclusion, the applicant's program which performed detailed inspections involving cleaning, repair, preservation, and physical protection for the penetration pigtail field splices and their associated Kapton insulated conductors, including the area between the polyolefin jacketing to the exit feed through penetration tubing, appeared to be adequate to correct the concerns identified in this allegation for Unit 1. However, pending the implementation of comprehensive programmatic controls for Unit 2 activities in the form of a revision to the controlling electrical specification, this item is identified as an open item (446/8984-O-02). The allegation is considered to be closed.

b. (Open) Allegation (OSP-89-A-18): As identified to members of the NRC staff in the Region IV office on September 18, 1989, the alleger identified concerns regarding the use of Kapton wiring and the routing of redundant power trains. These concerns were documented in an NRC response from James E. Lyons to the alleger. In particular, item 2 of Enclosure 1 of this letter identified a concern regarding the potential violation of the minimum bend radius of Kapton coated wires associated with the Unit 2 reactor coolant pump motor termination kits.

In response to this concern, the NRC inspector randomly selected and examined the main motor lead termination box for the Unit 2 reactor coolant pump No. TCX-RC-PC-03. The NRC inspector determined that there were no apparent violations of the minimum bend radius and that the power cables were not insulated with Kapton. Therefore, this portion of the allegation could not be substantiated.

Item 3 of the reference enclosure alluded to the applicant's failure to provide proper separation consideration to the routing of the power leads to the reactor coolant pumps.

Since the applicant has not classified the reactor coolant pumps (RCPs) as safety-related components, they are not in the applicant's accident analysis and they are not required to be powered by separate and redundant power supplies. Therefore, the allegers assertion that the two trains of power were run side-by-side for the Unit 2 RCPs which resulted in a "design problem with backup safety systems" could not be substantiated.

c. During this reporting period, the NRC was advised of employee concerns expressed through the applicant's SAFETEAM organization and by the Citizens Association for Sound Energy (CASE) by letter dated November 29, 1989, of potential QC management discrepancies identified during the receipt inspection of thermolag. Thermolag is a fire barrier material which is supplied from the manufacturer, Thermal Science, Inc., in various configurations and is applied to selected electrical raceways throughout the plant to provide the one hour barrier protection requirements.

Specifically, one of the concerns identified to SAFETEAM and which was the subject of the referenced CASE letter, involved the allegation that QC receipt inspectors were directed by their immediate management not to document identified discrepancies on thermolag material on a NCR as specified in Receiving Inspection Procedure NQA-3.09-11.03. At the conclusion of this reporting period, the NRC inspector had not completed the investigation of this issue; therefore, pending the resolution of this concern, it is identified as an open item (445/8984-O-03).

6. <u>Electrical Components and Systems (51053, 51063, 52053, 51055)</u>

During this reporting period, the NRC inspectors performed direct inspections of work performance to determine if the technical requirements contained in the applicant's Final Safety Analysis Report (FSAR) for safety-related electrical

systems and components had been adequately translated into applicable drawings, procedures, and instructions. Additionally, the NRC inspectors evaluated the applicant's work control program to determine if the specified documents and procedures were of sufficient detail to provide adequate work performance and control.

Specifically, the NRC inspector observed work in progress involving containment spray motor operated valve (MOV) 1-HV-4702. As previously identified in NRC Inspection Reports 50-445/89-60; 50-446/89-60 and as detailed in the technical disposition of NCR 89-11243, Revision 0, the Okonite 35 jacketing tapes used on the "V"-splices of the motor leads were not installed in accordance with Electrical Specification 2323-ES-100, Appendix I. The NRC inspector witnessed portions of the implementation of this activity including the removal of the existing Okonite jacketing tape. During this process, the NRC inspector observed an improperly suspended cable grip on electrical penetration assembly E-76 module which was located inside the isolation tank for the subject MOV. The cable grip bail was located at the module polymer seal and could easily have damaged the seal or the Kapton insulated wiring associated with the penetration. Subsequent to the NRC inspectors identification of this condition, the controlling work order C890015639 was revised to reposition the cable support in accordance with DCA 59365.

As stated in the applicant's Electrical Installation Specification 2323-ES-100, Revision 6, paragraph 3.2.3.1, requires that cable support systems shall be installed in accordance with the engineering drawings and appendix N of the specification. Contrary to this requirement, the subject cable grip was not properly installed. This example of the applicant's failure to follow procedures in establishing appropriate configuration control is identified as a violation (445/8984-V-01).

The NRC inspector also observed the maintenance activities associated with the replacement of the motor leads for MOV 1HV-4782. During the conduct of this work which was being performed in accordance with NCR 89-11243, the NRC inspector observed that the electrical craft personnel involved in this activity inadvertently signed off a procedural step without actually accomplishing the action required. In that this act was detected by the craft personnel involved and that this and all subsequent work was accomplished correctly, this procedural error is regarded as a minor discrepancy.

The NRC inspector also observed several procedural ambiguities involving the taping process when filling in the voids around the bolted lug splices. In addressing this issue, it is noted that the applicant's electrical maintenance and QC management

personnel responded quickly to provide a procedure change notice which clarified the splice taping requirements and provided additional training.

Within the instrumentation area, the NRC inspector observed work in progress per work order C890014773 on flow transmitter 1FT-4689 which was being conducted in accordance with work order C890014773. This work involved the retermination of the electrical conductor seal assembly (ECSA) to the transmitter after replacement of the transmitter (PET 2365). During the conduct of this evaluation, a discrepancy developed concerning the proper connector to use on the wires. This discrepancy was apparently due to a "typo" in the work order. Subsequent action by the craft personnel and the QC inspector present provided the necessary clarification of the work order prior to proceeding. The NRC inspector reviewed the work package and determined that there were no other discrepancies.

7. Safety-Related Mechanical Components (50071, 50073, 30702)

An NRC Augmented Inspection Team (AIT) conducted an inspection during the period May 15 through June 16, 1989, concerning Borg-Warner check valve failures which allowed backflow through the auxiliary feedwater system during hot functional testing of Unit 1. The team's findings were documented in NRC Inspection Report 50-445/89-30; 50-446/89-30 and were discussed with the applicant on June 16 and 17, 1989. The applicant provided a response to the AIT report on August 18, 1989, by letter TXX-89596. A NRC request for clarification and additional information dated September 14, 1989, was responded to by the applicant on October 14, 1989, by letter TXX-89744.

During this report period, a management meeting and an enforcement conference concerning the Borg-Warner check valve issues were held in Arlington, Texas, on November 17, 1989. During those meetings, the applicant presented a summary of the events and corrective actions to prevent recurrence. The NRC is currently evaluating the information presented at the above meetings and the findings of the AIT team for possible enforcement action.

8. Plant Tours (42051C, 51053, 52053)

The NRC inspectors conducted routine plant tours during this inspection period which included evaluation of work in progress as well as completed work to determine if activities involving safety-related electrical systems and components including electrical cable were being controlled and accomplished in accordance with regulatory requirements, industry standards, and the applicant's procedures.

Relative to fire prevention inspections, the NRC inspector observed several fire watch personnel performing portions of their rounds during this reporting period. The NRC inspector reviewed the fire watch logs in various plant areas which indicated that the hourly inspections were being conducted in a timely manner and with no discrepancies observed. Additionally, the NRC inspector observed that the plant is attaining a higher level of cleanliness and that in general, the systems/components evaluated appeared very good.

No violations or deviations were identified.

9. Open Items

Open items are matters which have been discussed with the applicant, which will be reviewed further by the inspector, and which involve some action on the part of the NRC or applicant or both. Two open items disclosed during the inspection are discussed in paragraph 5.

10. Exit Meeting (30703B)

An exit meeting was conducted December 5, 1989, with the applicant's representatives identified in paragraph 1 of this report. No written material was provided to the applicant by the inspectors during this reporting period. The applicant did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection. During this meeting, the NRC inspectors summarized the scope and findings of the inspection.