

U. S. NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION

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: February 8 through March 7, 1989

Inspection conducted by NRC consultants:

M. K. Graham - Parameter (paragraphs 2.a, 2.c, 3.a, 3.c,  
3.d, 3.g, 4.b, 4.d-g, 4.j-l,  
and 4.n)  
P. Stanish - Parameter (paragraphs 2.b, 2.d, 3.b, 3.e-f,  
3.h, 4.a, 4.c, 4.h-i, 4.m,  
and 5)

Reviewed by:

H. H. Livermore  
H. H. Livermore, Lead Senior Inspector

3-24-89  
Date

Inspection Summary:

Inspection Conducted: February 8 through March 7, 1989 (Report 50-445/89-12; 50-446/89-12)

Areas Inspected: Unannounced, resident safety inspection of applicant's action on previous inspection findings, follow-up on violations/deviations, action on 10 CFR Part 50.55(e) deficiencies identified by the applicant, piping systems and supports, and general plant areas (tours).

Results: Within the areas inspected no significant strengths were identified; however, a potential weakness was identified in SWEC's quality program related to backdating signature authority for certain quality documents (paragraph 3.f) and a significant weakness was identified in the applicant's Post-Construction Hardware Validation Program (PCHVP) inspection and surveillance program for pipe supports (paragraph 5). Three violations were identified for (1) multiple errors in Stone and Webster Engineering Corporation's (SWEC's) calculations for piping and pipe supports (paragraph 2.d), (2) multiple examples of discrepancies found in pipe supports that have been accepted by PCHVP (paragraph 5), and (3) inadequate review of a vendors product for suitability for its intended function (paragraph 2.b).

DETAILS1. Persons Contacted

\*R. W. Ackley, Jr., Director, CECO  
 \*M. Alexander, Manager of Materials Management, TU Electric  
 \*J. L. Barker, Manager, Engineering Assurance, TU Electric  
 \*D. P. Barry, Sr., Manager, Engineering, SWEC  
 \*J. W. Beck, Vice President, Nuclear Engineering, TU Electric  
 \*H. D. Bruner, Senior Vice President, TU Electric  
 \*J. Buck, Senior Review Team  
 \*W. J. Cahill, Executive Vice President, Nuclear, TU Electric  
 \*J. T. Conly, APE-Licensing, SWEC  
 \*W. G. Counsil, Vice Chairman, Nuclear, TU Electric  
 \*C. G. Creamer, Instrumentation & Control (I&C) Engineering Manager, TU Electric  
 \*G. G. Davis, Nuclear Operations Inspection Report Item Coordinator, TU Electric  
 \*D. E. Deviney, Deputy Director, Quality Assurance (QA), TU Electric  
 \*J. C. Finneran, Jr., Acting Manager, Civil Engineering, TU Electric  
 \*C. A. Fonseca, Deputy Director, CECO  
 \*W. G. Guldemon, Manager of Site Licensing, TU Electric  
 \*T. L. Heatherly, Licensing Compliance Engineer, TU Electric  
 \*J. C. Hicks, Licensing Compliance Manager, TU Electric  
 \*C. B. Hogg, Engineering Manager, TU Electric  
 \*S. D. Karpyak, Nuclear Engineering, TU Electric  
 \*J. J. Kelley, Manager, Plant Operations, TU Electric  
 \*J. J. LaMarca, Electrical Engineering Manager, TU Electric  
 \*O. W. Lowe, Director of Engineering, TU Electric  
 \*J. W. Muffett, Manager of Engineering, TU Electric  
 \*W. E. Nyer, Consultant, TU Electric  
 \*E. F. Ottney, Program Manager, CASE  
 \*S. S. Palmer, Project Manager, TU Electric  
 \*W. J. Parker, Project Engineering Manager, SWEC/CFCO  
 \*A. Pereira, Assistant to Deputy Director, QA, Ebasco  
 \*D. M. Reynerson, Director of Construction, TU Electric  
 \*A. B. Scott, Vice President, Nuclear Operations, TU Electric  
 \*C. E. Scott, Manager, Startup, TU Electric  
 \*J. C. Smith, Plant Operations Staff, TU Electric  
 \*C. L. Terry, Unit 1 Project Manager, TU Electric  
 \*R. G. Withrow, EA Systems Manager, TU Electric  
 \*D. R. Woodlan, Docket Licensing Manager, TU Electric  
 \*J. E. Wren, Assistant Director to QA for Administration, TU Electric

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

\*Denotes personnel present at the March 7, 1989, exit meeting.



2. Applicant Action on Previous Inspection Findings (92701)

- a. (Closed) Open Item (445/8513-O-44): During reinspection of pipe support MS-1-002-008-C72K, Evaluation Research Corporation (ERC) identified the following conditions to the NRC inspector as subject to evaluation as potential deviations: (1) material identification missing from one item; (2) bill of material quantities for two items differed from actual installed quantities; (3) bolt hole location, attachments to baseplate, and a component member location were out of tolerance; (4) U-bolts had zero clearance; (5) baseplate violated perimeter contact requirements; (6) locking devices on nine 2-inch diameter bolts were missing; (7) item 13 Hilti bolts violated embedment requirements; (8) snubber extension piece thread engagement could not be determined; (9) paint on spherical bearings; (10) no welder identification on integral Attachment No. 4; and (11) seven undersize welds were identified.

NCR M-23345 was issued to document the ERC deviations. Subsequent evaluations by ERC and TU Electric resulted in the following conclusions and actions with respect to the potential deviations: (1) review of QI-QAP 11.1-28, Revision 34, determined that the material was acceptable; material identification is only required until the installation of the component support is accepted by Quality Control (QC); and this support had been accepted by QC; (2) Design Change Authorization (DCA) 39493 was issued which revised the design drawing to show the correct quantity; (3) the design drawing was revised per DCA 39493 to show proper dimensions; (4) subsequent evaluation concluded that zero clearance was appropriate and acceptable for the specific application and was not a nonconforming condition; (5) the perimeter contact requirements were determined to be acceptable and DCA 39493, Revision 1, revised the design drawing to reflect the as-built condition; (6) review of Gibbs and Hill drawing 2323-S1-0568 provided information that the bolts were manufactured from high strength material and that locking devices are not required; (7) Hilti embedment requirements were determined to be acceptable based upon Technical Information Request (TIR) 124; (8) thread engagement was verified during installation inspection and was documented on an installation checklist as being acceptable; (9) QI-QAP 11.1-28, Revision 34, permits paint to be on the spherical bearings provided the snubber/strut gimbals freely and QC inspection dated May 5, 1986, verified that the snubber gimbals freely; (10) ASME Code requires that the owner



need only keep a record of the welders who made the weld joint; and (11) the design drawing was revised per DCA 39493, Revision 1, to reflect the actual weld sizes.

NRC review of Nonconformance Report (NCR) M-23345 concludes that the ERC deviations have been properly documented and dispositioned. This open item is closed.

- b. (Closed) Unresolved Item (445/8811-U-05): This item is being closed in this inspection period and elevated to a violation. This unresolved item involved the use of ASTM-A-307 (low strength steel) bolting to attach transition kits and forward bracket assemblies to mechanical shock arrestors.

In response to this item, SWEC performed calculation 1-15454-NZ(C)-GENX-0303 which indicated that some of the bolts would have been overstressed if subjected to their maximum allowable design load. The cause of the deficiency, as stated by the applicant, appears to be inappropriate and insufficient specification of load capacities by the manufacturer, NPS Industries.

This failure to review for suitability of materials for their intended function is a violation of Criterion III (445/8912-V-01).

- c. (Closed) Open Item (445/8865-O-01): The NRC inspector identified that the ears of a cotter pin which prevent the dislocation of a load pin on pipe support CC-1-016-700-A43R were not spread as required by installation and inspection procedures. Dislocation of the load pin would prevent the pipe support from performing its required design function. This support had been hardware validated under the PCHVP program.

Due to other NRC inspection findings related to pipe supports which have been inspected and accepted under PCHVP requirements, this open item is being included in the violation (445/8912-V-03). This open item is closed.

- d. (Closed) Unresolved Item (445/8871-U-01): This item is being closed in this inspection period and elevated to a violation. This unresolved item involved several examples of errors in piping and pipe support calculations performed by SWEC. The examples cited were:

- (1) Calculation GENX-315, Revision 0, and Calculation Change Notice (CCN) 1 to this revision of the calculation were initiated in response to the excessive water corrosion found in areas of the Station Service Water System. This was caused by

failure of the internal plasite coating. The corrosion caused localized pipe wall thinning in various areas of this system. This calculation was intended to determine the minimum pipe wall thickness required to satisfy the ASME Code design requirements and the system functional capability requirements. Later this calculation method was utilized to justify that damage caused to the piping during the coating removal process need not be repaired prior to plant operation.

Review of this calculation and its CCN by the NRC inspector revealed that the preparer did not follow the analysis procedure outlined within the body of the calculation and that the reviewer did not identify the many procedural violations, such as the use of improper stress intensification factors and performing functionality checks using incorrect pipe wall thickness.

- (2) The NRC inspector also reviewed 28 pipe support calculations performed by SWEC with the following results:
- . CT-1-137-714-S22R - The forces and moments were transposed incorrectly from one part of the analysis to another.
  - . H-SW-1-SB-019-017-5 - In three different instances moments were calculated incorrectly.
  - . H-CC-1-SB-046B-011-5 - The computer model was incorrect.
  - . CC-1-068-028-A33R - The forces and moments were applied on the wrong axes in one weld calculation. The other weld calculation assumed an all-around weld on a rear bracket, but the weld shown on the support drawing was only a two-sided weld.
  - . CS-1-SB-053A-001-2 - The out-of-plane force components were not evaluated. The local effects were not evaluated.
  - . SI-1-093-011-S42R - The load calculated for the local stress evaluation was incorrect. A web crippling calculation was not performed. The computer model was unconservative.
  - . SI-1-SB-024-007-2 - There were several modeling errors in the computer input.



- . CC-1-146-013-S43R - The construction tolerance was only considered in one direction which was possibly not the worst case. The load applied in the "Z" direction was incorrect. The slenderness ratio was calculated incorrectly.
- . CS-1-906-032-S42K - The wrong force was used to calculate the moment.
- . CT-1-011-005-S22K - The location of one bolt in the baseplate analysis was incorrect.
- . SI-1-039-026-S32R - The weld configuration analyzed does not agree with the as-built.
- . SI-1-039-042-S42K - The moments in the weld analysis were applied in the wrong direction. The plate geometry in the baseplate analysis was incorrect.
- . VD-1-049-017-S45R - The weld analysis was incomplete.
- . SI-1-095-003-S42R - The distance to one of the anchor bolts in the baseplate analysis was incorrect.
- . MS-1-025-008-S75K - The construction tolerance was not factored into the analysis.
- . CT-1-008-004-S22R - The loads due to thermal and construction offsets were not considered. The location of two of the anchor bolts in the baseplate analysis were incorrect.
- . CS-X-AB-014-001-5 - The length of the weld was incorrect in the weld analysis. The baseplate model does not agree with the as-built.
- . CC-X-079-005-A43K - Member properties used in the local stress evaluation were incorrect.
- . SW-1-AB-014-018-3 - The construction tolerance was not factored into the analysis.

The following supports were also reviewed and were found to be acceptable:

CT-1-137-704-S22R  
 H-SW-1-SB-001A-022-5  
 CC-2-952-700-E33R  
 CT-1-110-701-S22R



CT-1-056-004-S32R  
 CC-1-323-726-A43R  
 MS-1-025-009-S75K  
 RH-1-004-005-S42K  
 AF-1-008-004-S33R

The failure to perform an adequate review of design calculations is a violation of Criterion III (445/8912-V-02). Based on the upgrading of the initial inspection finding to a violation, this unresolved item is closed.

3. Follow-up on Violations/Deviations (92702)

- a. (Open) Violation (445/8426-V-02): This violation was identified as a result of construction completion room/area inspections performed by NRC inspectors during the period of July 16, 1984, through September 28, 1984. Portions of safety-related systems were examined during the inspection and the following deficiencies were identified:
- (1) Cable Tray Hanger CTH-639 was missing the diagonal brace called for on drawings 2323-E1-0601-01S and 2323-S-901.
  - (2) Cable Tray Hanger CTH-12416 had the horizontal legs aligned north-south versus east-west as called out on drawing 2323-E1-0601-01S and FSE-00159 sheet 12416.
  - (3) The pipe support of drawing CT-1-014-015-S42K was missing two welds. Other weld deficiencies were noted on AF-1-026-005-S33R, MS-1-026-010-S75K, and instrument rack CP1-EIPRLI-31.
  - (4) Baseplate Hilti location dimension discrepancies were noted for drawings AF-1-035-037-Y33R, AF-1-035-034-Y33R, and MS-1-078-047-S43K.
  - (5) Dimensional discrepancies were noted for drawings AF-1-026-003-S33R, CC-1-011-034-A63K, CC-1-043-013-A43K, MS-1-026-010-S75K, CC-1-236-700-C53R, CC-1-234-700-C53R, MS-1-025-009-R75K, CS-1-AB-208A-001, CC-1-238-004-C53R, CS-1-564-706-A33R.
  - (6) The pipe clamp of drawing AF-1-103-036-S53K was resting on the adjacent floor penetration pipe. This could have caused the penetration pipe to support the system pipe.

- (7) Conduit support C14010056-2 had a Hilti bolt with insufficient thread engagement.
- (8) The instrument tube from 1-FT-2488 (HP) touched a pipe support at a 90 degree bend 4 feet 2 3/4 inches from valve 1AF-0039.

The above are examples identified by the NRC inspectors where items were installed by the craft to conditions other than those specified by the identified design documents, QC inspections had been completed, and the QC inspectors failed to identify these conditions.

As a result of the NRC violation, TU Electric letters TXX-4429 dated February 28, 1985, and TXX-4513 dated July 30, 1985, provided the following response to the NRC identified deficiencies:

- (1) The condition, as described for CTH-639, was identified on and corrected per disposition of NCR M-84-100470.
- (2) The condition, as described for CTH-12416, was identified on and corrected per disposition of NCR M-84-100476.
- (3) The condition, as described for pipe support CT-1-014-015-S42K was identified on and corrected per disposition of NCR M-14722. With regard to weld deficiencies found on pipe support AF-1-026-005-S33R, there was no requirement to show additional welds not required by design on the drawing. These welds were annotated on the vendor certified drawing (VCD) inspection conducted on June 23, 1983, and are part of the as-constructed history package. To preclude further question, QI-QAP-11.1-28 was revised to reflect that engineering will show all as-installed welds for Unit 2, regardless of their significance to the design analysis.

With regard to the weld fit-up gap for an I-beam on pipe support AF-1-206-005-S33R, the fit-up gap is within the permissible tolerance, and the weld size was increased to provide the required reinforcement when the fit-up exceeded 1/16-inch gap.

With regard to undersize welds located on instrumentation rack CP-1-EIPRLI-31, the condition was identified on and corrected per disposition of NCR I-84-100493. The disposition of this NCR called for reinspection of all Unit 1 instrument racks.



This was completed and deficiencies corrected prior to closure of the NCR.

- (4) The condition as described for pipe support AF-1-035-037-Y33R was identified on and corrected per disposition of NCR M-14680. The condition as described for pipe support AF-1-035-034-Y33R was identified on and corrected per disposition of NCR M-14679. The condition as described for pipe support MS-1-028-047-S43K was identified on and corrected per disposition of NCR M-14842.
- (5) QC has reinspected pipe support AF-1-026-003-S33R and finds the grout to be slightly greater than 1 inch but less than 1 1/8-inch thick. Sufficient embedment has been obtained and the VCD was revised to reflect grout thickness.

Pipe support CC-1-011-034-A63K has been reinspected and was found to be acceptable. The dimension in question has a tolerance of  $\pm 2$  inches based on pipe location (QI-QAP-11.1-28, paragraph 3.3.7). NCR M-14745 was issued in response to the NRC concern; however, the VCD was revised to reflect the as-constructed dimension.

The condition as described for pipe support MS-1-026-010-S75K was identified on and corrected per disposition of NCR M-15150. The condition as described for pipe support CC-1-236-700-C53R was identified on and corrected per disposition of NCR 84-0269. The condition as described for pipe support CC-1-234-700-C53R was identified on and corrected per disposition of NCR 84-0267. The condition as described for pipe support MS-1-025-009-R75K and corrected per disposition of NCR M-15151. The condition as described for pipe support CS-1-AB-208A-001 was identified on and corrected per disposition of NCR M-14713. The condition as described for pipe support CC-1-238-004-C53R was identified on and corrected per disposition of NCR 84-0268. The condition as described for pipe support CS-1-564-706-A33R was identified on and corrected per disposition of NCR M-14712.

- (6) The subject support is a strut and the correct number should be AF-1-103-026-S53R. It is believed that the pipe clamp location was inadvertently moved during construction activities in the area after final acceptance by QC on the Hanger Inspection Report; this caused the strut installation angle to



be incorrect. The clamp was returned to its design installation angle in accordance with NCR M-14756 correcting this problem. As a result of the above action, the clamp no longer rests on the floor penetration.

- (7) The condition as described for conduit support C14010056-2 was identified on and corrected per disposition of NCR M-84-100471 (closed October 4, 1984). CMC 100703, Revision 0 was issued to allow the specific nut in question to be a maximum of 0.05 inches above flush.
- (8) The condition which was described for instrument tube from 1-FT-2488(HP) should be identified as tube from 1-FT-2458. The condition was corrected during normal inspection processes, and was documented on Inspection Report I-1-00545-4. No further action is considered necessary in that it could not be determined if the minimum air gap was present at the time of the original inspection or it had been caused by subsequent work in the area.

To preclude recurrence of the violation, TU Electric revised the procedures for fabrication and installation inspection of safety class component supports to require a more detailed recording of information obtained during the inspection.

With respect to the generic implications pertaining to the safety-related items not inspected to the revised inspection requirements, CPRT conducted a comprehensive sampling process to identify other similar conditions as those found during NRC construction completion room/area inspections. Results from the CPRT sampling of completed safety-related work led, in part, to the development and implementation of the TU Electric Corrective Action Program (CAP).

The NRC inspector has reviewed TU Electric's response to the violation, letters TXX-4429 and TXX-4513, and concludes that TU Electric has taken appropriate corrective action for the specific deficiencies based upon a review of the dispositioned NCRs. NRC review of the revised procedures concludes that those revisions should preclude recurrence of the violation. The NRC staff closely monitored the CPRT reinspection sampling process, compilation of data from that effort, and conclusions reached concerning the quality of construction for all safety-related components.

TU Electric's CAP which provides resolution of all construction deficiencies identified by CPRT has been reviewed and approved by the NRC staff.

Recent NRC inspection of pipe support installations which have been QC inspected and accepted under requirements of the PCHVP has revealed specific cases where the PCHVP did not resolve noncompliance with design and installation requirements. Due to the large number of inspection findings identified by violation 445/8912-V-03, the preventive actions evaluation of this violation will remain open pending further NRC inspection.

- b. (Closed) Violation (445/8622-V-04): As a result of deviation reports (DRs) identifying the lack of traceability between the installed bonnet and the vendor supplied NPV-1 form for valve tag Nos. 1-7046 and XSF-179, NCRs were issued by Brown and Root (B&R). NCRs M-23175N, Revision 1, and M-23178N were dispositioned by stating that documentation, except for hydrostatic testing, was received from the vendor indicating that the bonnet material met all applicable requirements of ASME Section II and Section III, ND-2000. The NRC inspector determined that this disposition was incorrect.

In response to the violation, the applicant revised NCR M-23175N based on certification received from the vendor. NCR M-23178 was revised to require a new bonnet to be installed and the old bonnet scrapped. Also, a review of previously dispositioned NCRs was conducted as part of Corrective Action Request (CAR)-062. This review effort provided assurance that the disposition of NCRs processed at CPSES has not resulted in any safety concern. As corrective action for the subject violation, the individual who dispositioned the NCRs was advised of the errors. Also, Corporate Procedure NEO 3.05 and Revision 8 to ECE-AD-5-2 were made effective, requiring additional reviews of "repair" or "use-as-is" dispositions to NCRs.

The NRC inspector has reviewed the revised NCRs, Revision 8 to ECE-AD-5-2, NEO 3.05, CAR-062 as well as inspected the valve and bonnet for the discrepancy identified on NCR M-23178N and concurs that the actions taken by the applicant fully address the concern identified in this violation. This violation is closed.

- c. (Closed) Violation (445/8716-V-12): The sway strut rear bracket load pin on safety-related pipe support CC-1-295-006-C53R, Revision 4, was observed on August 21, 1987, to have two missing cotter pins although this



support had been reworked by craft and accepted by QC in accordance with the Hardware Validation Program (HVP).

NCR 87-A01243 was written to document the condition identified during NRC inspection. This NCR and an additional similar condition, a loose jam nut - identified by the applicant, resulted in the issuance of CAR 87-075.

Corrective actions to avoid recurrence of this violation consisted of the following actions by TU Electric:

- . On October 27, 1987, a training memo was issued for sign-off by all Comanche Peak Engineering personnel. This memo included instructions on the protection of permanent plant equipment, and was transmitted to all engineering contractors for training of their personnel.
- . On February 1, 1988, Operations Procedure STA-606, "Work Requests and Work Order," was revised to require specific instructions for the removal and restoration of interferences.
- . On February 1, 1988, Startup Administrative Procedures CP-SAP-13, "Temporary Modifications," and CP-SAP-6, "Control of Work on Station Components After Release from Construction to Startup," were revised to contain a cautionary statement indicating that only the work contained in the work documents is permitted.
- . On February 4, 1988, the Construction Department issued ECC Policy Statement No. 2, "Maintaining Component Integrity," which emphasized the responsibility of individuals concerning component integrity.
- . On October 16, 1987, memo NE-13371 from the Vice President of Engineering and Construction was issued to engineering and construction personnel reiterating the CPSES policy that all nuclear, safety-related work must be performed in accordance with written engineering direction and approved procedures. Reading of this memo is now a part of the badging process.

The QA surveillance organization incorporated observation of work in the area of pipe supports into their surveillance program. Field activities will be surveilled during the remainder of the construction phase to provide assurance that the



activities being performed are within the scope of the applicable work documents.

Construction Procedure CP-CPM-7.1, "Package Flow Control," has been revised to require that work instructions contain specific direction to only perform those activities within the scope of the authorized documentation. The requirements of Procedure CP-CPM-6.10, "Inspected Item Removal Form," have been revised and incorporated into new Procedure ECC 2.13-5, "Construction Travelers," and ECC 2.13-5A, "Construction Traveler Generation," which will include appropriate guidance for working on or around accepted hardware.

The twelve CPE procedures that require personnel to enter Category I buildings have been revised to include cautionary statements regarding the alteration of installed and accepted equipment.

Painting Specifications 2323-AS-30 & 31 have been revised to include guidance for working on or around installed and accepted safety-related equipment.

CAR 87-075 which addresses the corrective and preventative actions identified above was closed on January 4, 1989.

The NRC inspector has reviewed closure of NCR 87-A01243 and the corrective and preventative actions detailed in CAR 87-075. NRC inspection concludes that TU Electric has established comprehensive procedural control for activities affecting quality and provided training and notification to personnel involved in those activities. This violation is closed.

d. (Closed) Violation (445/8820-V-04): NRC inspection of cable tray supports revealed the following deficient conditions:

- (1) An 8-inch long, 5/16-inch fillet weld required by the drawing for a cable tray support was measured as being 1/4 inch for the full length.
- (2) Two 6-inch long, 1/4-inch fillet welds required by the drawing for a cable tray support were measured as being 1/8-inch (due to an 1/8-inch gap between members) for the full length of both welds.

TU Electric letter TXX-88468, dated May 23, 1988, provides a response to the violation. The violation is

attributed to limited QC inspector error involving two QC inspectors. A review of cable tray hanger (CTH) surveillance reinspection results indicated that neither of the QC inspectors involved had accepted any undersized welds in the samples examined. NCRs 88-08411 and 88-08412 were initiated to resolve the discrepancies. Both NCRs were dispositioned "use-as-is" based on a review of Impell design calculations. The QC inspectors who accepted the deficient welding have been made aware of the NRC violation as an action to preclude recurrence.

The NRC inspector has reviewed the response to the violation and the closed NCRs and concludes that TU Electric has taken appropriate corrective and preventive action. This violation is closed.

- e. (Closed) Violation (445/8846-V-02): The NRC inspector identified that conduit support IN-C04G31220-51 was located 5 inches north of the location specified on the design drawing. Also, that several welds detailed on the design drawing did not exist. These items had not been identified during the final QC inspection.

The applicant attributed this violation to an isolated oversight by the QC inspector. This was based on QA inspection surveillance overviews of this QC inspector's work which resulted in an error rate of 0.6 percent. Also, NCR 88-11586 was issued and dispositioned to use the support as installed.

The NRC inspector has reviewed the NCR and its disposition as well as the DCA generated to reflect the as-built condition. Also reviewed were the calculations performed providing the basis of the NCR disposition. Further, the surveillance overview data for the QC inspector was reviewed and the NRC inspector concurs that this violation has been adequately addressed. This violation is closed.

- f. (Closed) Violation (445/8851-V-01): NRC review of DCA 74249, Revision 2, revealed that: (1) the engineer who originated this DCA also approved the reason for the change which is contrary to the requirements of Procedure ECE 5.01-03, Revision 1; and (2) this DCA, which is a revision to Specification 2323-SS-16B, a multidiscipline specification used by more than one of the site contractors had not undergone the same review and approval process as the original specification as required by Procedure ECE 5.02.

In response to this violation, TU Electric issued DRs P-88-03617 and P-88-03618. DR P-88-03618, which



dealt with the improper approval, was later determined not to be a deficient condition. This was based on an internal SWEC memorandum dated July 26, 1988, delegating signature authority to specific engineering personnel for various quality documents. It should be noted that the SWEC letter provided to the NRC inspector was dated subsequent to the issuance of the DR and the signature authority had been back-dated. This practice is perceived as questionable and a potential weakness in SWEC's Quality program. However, the intent of this approval of the reason for change on a DCA is to ensure that engineering personnel review proposed DCAs for the necessity of the design change. In this instance, since the DCA was initiated in engineering, there would not be an impact caused by the apparent violation.

For DR P-88-03617, which dealt with the review requirements for DCAs that revise specifications, an Engineering Design Change Notice (EDCN) was issued to impose the same review requirements on these DCAs as those defined for original specification revisions. Also, TU Electric Engineering Assurance (EA) reviewed all project specifications to determine those with shared responsibility and identified 2323-ES-100 and 2323-SS-16B as the only two. The page replacement DCAs against these specifications have been revised to conform with the requirement that a DCA that revises a specification be subjected to the same review and approval requirements as that of the original specification.

The NRC inspector has reviewed the DRs, DCAs, and the ECE procedure revisions and concurs that this issue has been adequately resolved. This violation is closed.

- g. (Closed) Violation (445/8856-V-01): NCR M-23438N, Revision 1, which identifies that Bill of Material items 7, 14, and 16 were installed on pipe support CC-1-040-019-E33S and did not meet material traceability requirements was dispositioned "Rework" and closed out although the material remained nonconforming and had not been reworked.

NCR-88-14132 was written to redocument the material deficiency on items 7, 14, and 16. This NCR has been dispositioned to replace items 7 and 14. Material traceability for item 16 has been established and the NCR has been dispositioned use-as-is for this piece.

DR C-88-04217 was initiated to document the improper closure of NCR M-23438N, Revision 1.



To preclude recurrence of the violation, ASME pipe support engineers, ASME welding engineers, ASME QA NCR reviewers, and ASME QC verifiers have been made aware of the circumstances involved in this violation by requiring that they read TU Electric's response to the violation.

TU Electric Quality Assurance has performed an audit of the NCR program that included an assessment of the adequacy of closure of ASME pipe support NCRs. No other instances were identified in which an NCR was improperly closed.

The NRC inspector has reviewed NCR 88-14132, DR C-88-04217, training documentation for personnel required to read the violation response, results of the QA audit, and documentation for replacement of the nonconforming material. NRC review concludes that TU Electric has corrected the nonconformance and has taken action which should preclude recurrence of this violation. This violation is closed.

- h. (Closed) Violation (445/8856-V-02; 446/8852-V-01): This violation identified the following discrepancies related to Calculation TNE-CS-CA-CA-1a, Revision 6:
- (1) Use of an unconservative design input for evaluating minimum separation requirements for certain 1/4-inch diameter Hilti Kwik bolts (HKBs).
  - (2) Violation of one of the limitations cited in the applicable Design Basis Document (DBD)-CS-015, Revision 2.
  - (3) A note on drawing S-0910, sheet CA-1b was inconsistent with Procedure CCI-113.

In response to this violation, the applicant attributed the above discrepancies to engineering errors of oversight. To correct the problem, the applicant has revised the subject calculation to incorporate more conservative design assumptions for HKB installations. Also, the DBD has been revised to allow alternate methods of calculation provided written approval of the applicable section manager is obtained. Also, a sample of the calculations performed and checked by the personnel who performed the subject calculation was completed and no further discrepancies were noted.

The inconsistent note on drawing S-0910, sheet CA-1b was removed via DCA-78209, Revision 0. Further, a review was performed of all conduit support typical drawings to determine if other drawings authorized exceptions to

Specification 2323-SS-30. No further discrepancies were noted.

The NRC inspector reviewed Ebasco internal correspondence advising the seismic conduit engineers of this violation. This letter stressed the need to carefully make assumptions, adhere to restrictions for usage of equations in DBDs, and that drawing notes must take into account construction procedures. Also reviewed by the NRC inspector were DCA 78209, Revision 0, the documentation for the review of the calculations performed by the engineers involved in the subject calculation; Revision 8, to calculation TNE-CS-CA-CA-1a, support CA-1b; SWEC letter SWE-0602 approving the calculation method; and Revision 5 to DBD-CS-015. The results of this review indicate that all committed actions have been adequately completed and are responsive to the issue brought forward in this violation. This violation is closed.

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

- a. (Closed) Construction Deficiency (SDAR CP-84-12): A deficiency was identified regarding the temperature envelope requirements on the environmental qualification (EQ) of equipment outside containment for high energy line breaks (HELB).

Essential components for this event were identified by the Systems Interaction Program (SIP) for mitigation of HELBs outside containment. An EQ review of the components and cables located in the affected compartments was conducted. The results of this review demonstrated that all CPSES equipment and cables, which are required to function to mitigate the consequences of a Main Steam Line Break (MSLB) with a superheated steam release outside containment and to provide subsequent safe shutdown capability, are qualified with adequate margin to function during the event. Sufficient information is available to control room operators for event mitigation as well as confirmation of essential safety functions. Therefore, the applicant has concluded, in the event this issue had remained uncorrected, no condition adverse to safety would have existed.

The NRC inspector has reviewed the report and supporting data generated by SWEC to address this issue and concurs that this issue has been adequately evaluated. This construction deficiency is closed.



- b. (Closed) Construction Deficiency (SDAR CP-85-22): An engineering review of vendor documentation revealed that some valves may not perform their intended safety function under certain conditions. TU Electric modified the containment pressure relief isolation valves to limit the maximum opening position in response to Three Mile Island (TMI) Action Plan requirements. During review of a stress report, the question was raised as to whether or not the valves had been demonstrated to be operable during and after a seismic event.

TU Electric engaged Corporate Consulting and Development Company, Ltd., (CCL) to assist in the detailed evaluation. CCL has extensive experience in seismic qualification. CCL determined that all calculated stresses satisfy the stress limit commitments of the FSAR. TU Electric has concluded that no safety concern exists.

The NRC inspector has reviewed ER-SYS-1, Revision 0, dated September 16, 1985, titled "Evaluation of Active Valve Specification and Procurement," and agrees with the applicant's conclusion that a safety concern does not exist. This construction deficiency is closed.

- c. (Closed) Construction Deficiency (SDAR CP-85-33): During a review of the seismic/nonseismic interaction program, it was determined that equipment (masses) supported by two inch and less nonseismic piping had not been evaluated.

A field verification walkdown was initiated to evaluate this issue. The result of the walkdown identified one potential interaction of indeterminate effect involving a valve in the waste processing system which, if it were to fail, could damage a flex conduit feeding a transformer. Further evaluation of the function of the transformer indicated that only non-Class 1E lighting panels are fed from this transformer. Therefore, a safety-related problem does not exist.

The NRC inspector reviewed the seismic/Nonseismic Interaction Matrix for the Waste Processing System, valve XLV-5287, flex conduit 1 1/2C02011977, drawing 2323-E1-0942, and is satisfied that this issue has been properly addressed. This construction deficiency is closed.

- d. (Closed) Construction Deficiency (SDAR CP-86-36): Large bore piping supports. This issue involves TU Electric's pipe support reverification program being conducted by SWEC. That program employs an expanded set of design and

installation criteria for the evaluation of the structural adequacy of existing pipe support installations. The engineering evaluation identified one instance which is reportable. On the seismic evaluation of stress problem 1-045T for the Chemical and Volume Control System (CVCS), the SWEC regualification indicated an overstress condition. The cause of the condition was SWEC's use of different response spectra than that contained in the original Gibbs and Hill (G&H) piping analysis.

The overstress condition in the CVCS, stress problem 1045T, were it to have remained uncorrected, could have adversely affected the safe operation of the plant in the event of an earthquake and was determined to be reportable. Corrective action is to add additional supports to relieve the overstress problem. Appropriate spectra will continue to be used for all stress problems in the regualification program, as was being used when the condition was identified.

The root cause of the overstress condition was the cumulative effects of multiple design changes under the SWEC regualification process. The scope of plant modifications resulting from this reverification program is of a magnitude such that other pipe support installations may be overstressed due to cumulative effects of regualification. TU Electric's CAP will identify and resolve similar conditions. The NRC staff has reviewed the CAP and documented the review conclusions in SSER-14.

On the basis of its review of the CAP design and interface controls, the staff concludes that the corrective actions are acceptable and satisfy the applicable requirements of 10 CFR 50, Appendix B, Criteria III and XVI. This conclusion is based on the following:

- . The applicant has satisfied the requirements of 10 CFR 50 Appendix B, Criterion III, with respect to establishing measures to ensure that the applicable regulatory requirements and the design basis are correctly translated into specifications, design drawings, and procedures by establishing design basis documents and implementing a complete design validation for piping and pipe supports important to safety. The design validation provides proper control of the design interface between the piping and pipe support groups and provides an adequate review of installed field designs and design changes.



- . The applicant has satisfied the requirements of 10 CFR 50, Appendix B, Criterion XVI, by establishing a program to correct design deficiencies and to preclude repetition of the underlying causes of the problems associated with the design of piping and pipe supports at the CPSES.

This construction deficiency is closed.

- e. (Closed) Construction Deficiency (SDAR CP-86-39): Cable tray C-Type clamp shim dimensions. The original design requirements specified the shim plates, when installed with "C-Type" clamps, to be flush with the tray web and extend a maximum of 1/2 inch beyond the outside of the web. This configuration is required to provide shimming under the full width of the tray flange.

Due to an error in transferring information from the original design change to the erection and inspection drawing, the shim plate tolerance of plus or minus 1/2 inch from the tray web was specified allowing the shim plate to be installed up to 1/2 inch inward from the web underneath the tray flange. As a result, some unacceptable clamp/shim configurations were installed and accepted.

A study documented SAG TUG 2.3494, Volume 1, Book 17 was performed indicating local stresses in the tray flange near the "C" clamp due to the maximum anticipated loading conditions were less than the allowable plastic limits given in the CPSES FSAR (Section 3.8.4.3.3) except for the T. J. Cope 4"x12" tray section.

A testing program conducted by CCL evaluated the T. J. Cope 4"x12" tray/clamp configuration. A 4"x36" tray was also included for testing for worst case loading conditions. Evaluation of these test results indicates that the potential condition of "C" clamps installed with a shim plate located 1/2 inch inward from the web is acceptable. These results have been documented in CCL Test Report A-738-87 and SAG TUG 1.8160 2.C.S.

The NRC inspector has reviewed the CCL Test Report A-738-87. All quality related aspects of the test program were conducted in accordance with CCL's Quality Assurance Program and the applicable requirements of ANSI N45.2-1972; 10 CFR 50, Appendix B; and 10 CFR 21. The report was approved and stamped by two registered professional engineers. The NRC inspector concurs that the deficiency is not safety significant and not reportable. This construction deficiency is closed.

- f. (Closed) Construction Deficiency (SDAR CP-86-72): Small bore piping supports. This issue involves TU Electric's pipe support reverification program being conducted by SWEC. That program involves an expanded set of design and installation criteria for the evaluation of the structural adequacy of existing pipe support installations. This issue was originally tracked under SDAR CP-86-36. TU Electric's letter TXX-6042 dated October 15, 1986, notified the NRC of the division of the issue into two parts to segregate small bore piping and pipe supports from large bore piping and supports. SDAR CP-86-36 became "Large Bore Piping and Supports" and SDAR CP-86-72 was assigned to "Small Bore Piping and Supports."

The issue was determined to be reportable due to an overstress condition for a pipe support in the Chemical and Volume Control System. TU Electric's CAI will identify and resolve similar conditions with respect to the design of pipe supports.

The NRC staff has reviewed the CAP and concludes that the corrective actions are acceptable (Reference closure of SDAR CP-86-36 in this report). This construction deficiency is closed.

- g. (Closed) Construction Deficiency (SDAR CP-87-10): Prior to October 1986, document and design control programs for design modifications were inadequate for systems which had been transferred to the operating staff.

This deficiency was the result of inadequate procedures governing the engineering change notice (ECN), field change request (FCR), and sketch processes. This issue is limited to design modifications for systems "turned-over" prior to October 31, 1986.

This issue represents a deficiency in design and document control which required extensive evaluation. Had the conditions remained uncorrected, subsequent review, system maintenance, and operations could have been compromised. TU Electric determined that the condition was reportable.

CAR 87-027 was issued to address concerns with Design Modification (DM) control on systems turned over from construction to operations prior to October 31, 1986.

A root cause was determined to be inadequate procedures that governed ECN and FCR processes. The procedures did not require a central log for design changes or other assurances that applicable documents reflect the current



design. As prescribed in the site-initiated CAR issued to document this deficiency, the improperly controlled documents have been indexed and entered into the project design change database. Further deficiencies of this nature will be precluded by the implementation of NEO 3.03, "Preparation, Review, and Disposition of Plant Design Modifications."

The NRC inspector has reviewed the corrective and preventative actions prescribed by CAR 87-027, including Procedure NEO 3.03, and concludes that TU Electric has taken appropriate actions with respect to the reportable deficiency. This construction deficiency is closed.

- h. (Closed) Construction Deficiency (SDAR CP-87-18): Errors identified during a review of the vendor qualification documentation for the Component Cooling Water (CCW) Heat Exchanger indicated additional analysis was required. Initial evaluation indicated that nozzle loading conditions exceeded specification requirements and the nozzles could be overstressed.

Reanalysis of the heat exchanger using as-built piping nozzle loads was performed. Calculations IMT-CA-EQ-0119-MS-49 for Unit 1 and IMT-CA-EQ-0154-MS-49 for Unit 2 demonstrate that the heat exchangers are acceptable with the as-built piping loads.

The NRC inspector has reviewed the calculations for the heat exchangers and is satisfied that they are adequate as installed. This construction deficiency is closed.

- i. (Closed) Construction Deficiency (SDAR CP-87-34): During evaluation of the loads generated at equipment nozzles in the pipe stress analysis, the proper interface may not have been consistently identified between the pipe stress analysis organization (SWEC-PSAS) and the equipment supplier. One hundred thirty-one equipment nozzles were identified as affected by this condition

SWEC performed an engineering evaluation which indicated that in all cases the revised loads resulting from the correct interface were within acceptable limits.

The NRC inspector reviewed the evaluation performed by SWEC and concurs that this issue is adequately resolved. This construction deficiency is closed.

- j. (Closed) Construction Deficiency (SDAR CP-87-59): Improper application of construction aids. Vendor supplied cable tray fittings, intended for use solely as construction alignment aids for cable trays, were

utilized in the system analyses of cable tray hangers and cable trays as structural members which would provide tray continuity.

The root cause of the deficiency was the failure of the design documents associated with installation of the cable tray fittings to conform to the criteria and bases stated in the FSAR. The condition represents a significant deficiency in final design and was deemed reportable.

TU Electric's letter TXX-6750 dated September 21, 1987, with respect to corrective action states, in part, "T-1W and T-11W fittings have been determined to be inadequate. In each instance where these fittings have been employed, Nonconformance Reports (NCRs) will be issued and the fittings replaced with field fabricated fittings through Design Change Authorizations or other approved CPSES program documents. Any deficiencies concerning rung spacing will be documented and corrected during fitting replacement."

The NRC inspector has reviewed CAR 87-031, which provides corrective action instructions, and concludes that appropriate control of corrective actions has been established. DCA 58483, Revision 2, has been issued to provide detailed instructions for installation and removal of the deficient cable tray connectors. This construction deficiency is closed.

- k. (Closed) Construction Deficiency (SDAR CP-87-77): Cable tray weld documentation. Weld documentation for cable trays normally consists of the inspection report with the QC inspector signature, the welders identification symbol and weld application information. However, during a review of these documentation packages, it was determined that some of the above information was missing from 21 items.

TU Electric's evaluation of the deficiencies concludes that all fillet welds on cable tray fittings were performed with one approved procedure, Specification 10046. The welders were qualified in accordance with specification WES-031 for manual shielded metal arc welding using E7018 electrodes. This being the case, and since welder identification has no detrimental impact on the structural integrity of the hardware, welder traceability to each individual fillet weld is not considered necessary.

Based on the results of TU Electric's evaluation, the missing documentation problem does not represent a



significant deficiency in the design or construction of the plant. Had this documentation problem not been discovered, no condition adverse to safe operations would have existed.

The NRC inspector concurs that the missing cable tray weld documentation is not safety significant and is not reportable. This construction deficiency is closed.

1. (Closed) Construction Deficiency (SDAR CP-87-78): Cable tray welding procedures. All of the requirements for inspection in accordance with the AWS D1.1 Code were not included in the inspection procedures used to inspect and document cable tray welding.

TU Electric has determined that the inadequate procedures by themselves do not meet the criteria for reportability under 10 CFR 50.55(e), but do represent a secondary cause of weld deficiencies reported on SDAR CP-87-138.

SDAR CP-87-138 provides a reportability evaluation and describes corrective action taken to resolve the welding deficiencies for which the procedural deficiencies were a contributing factor.

The NRC inspector concurs with TU Electric evaluation for reportability of this deficiency and has reviewed SDAR CP-87-138 which was deemed reportable. NRC inspection of SDAR CP-87-138 concludes that appropriate corrective and preventive action have been taken. This construction deficiency is closed.

- m. (Closed - Unit 1 only) Construction Deficiency (SDAR CP-87-90): The physical arrangement of the residual heat removal (RHR) pump suction relief valves inlet piping prevents the valves (1-8708 A and B) from meeting their design basis relieving requirements. This condition is due to the excessive elevation (over 22 feet) and distance (over 100 feet) of the valves from the RHR suction piping. An increase in pump suction pressure, when combined with relief valve inlet line losses, elevation head between the relief valves and the RHR pumps, and pump head, could cause the pump discharge piping pressure to exceed the ASME Code allowable value (design plus 10% per NC-7311b) by as much as 15 percent. This condition does not meet the requirements of paragraphs NC-7141c and NC-7311b of the ASME Code, Section III. Valve chattering could also occur due to the rapid reduction in the valve inlet pressure as soon as the valve lifts. This condition was caused by a design error.

To preclude repetition of this problem DBD ME-260, "Residual Heat Removal System," which contains criteria governing these relief valve installations was issued as a guide for future plant modifications.

Corrective actions were to relocate the subject valves to comply with the ASME Code. The NRC inspector has reviewed the DBD and the calculation for the revised installation as well as reviewing the new piping configuration and is satisfied that the actions taken will fully resolve this issue. This construction deficiency is closed for Unit 1.

- n. (Closed) Construction Deficiency (SDAR CP-87-138):  
Welding slag inclusions. Deficient cable tray welds were identified while performing inspection of coated welds per STIR-SWEC-M-002, "Reinspection of Coated Welds." Eleven cable tray welds were identified as having slag inclusions the full length of the weld. The specific cases identified were evaluated by engineering and one of those was determined to be safety significant. However, because an adequate basis could not be established to conclude that no safety significant weld deficiencies existed in the total population, TU Electric determined that the issue was reportable.

A root cause analysis concluded that the weld deficiencies identified were the result of inadequate technical requirements and poor workmanship. A secondary cause was inadequate inspection procedures. These deficiencies are considered generic to the total population of field fabricated cable tray fitting welds.

A 100% inspection of cable tray fitting welds is being conducted as part of the Post-Construction Hardware Validation Program (PCHVP) under Field Verification Methods (FVM) CPE-EB-FVM-CS-084, CPE-EB-FVM-CS-048, and CPE-EB-FVM-CS-019. The identification of any deficient cable tray fittings from these FVMs are being documented and processed utilizing NCRs and DCAs. Hardware modifications will be completed in conjunction with the PCHVP.

In order to prevent recurrence of this deficiency, the following engineering, construction, and inspection procedures have been issued or revised.

- (1) DBD-CS-082 "Cable Tray and Cable Tray Hanger Design Basis Document"
- (2) ECP-10 "Cable Tray and Hangers Installation-Unit 1"



- (3) ECF-10A "Cable Tray and Hangers Installation-Unit 2"
- (4) NQA3.09-10.01 "Requirements for Visual Weld Inspections"

NRC inspection of the FVMs associated with cable tray welding and review of procedure revisions concludes that TU Electric has satisfactorily implemented appropriate corrective and preventive actions for the construction deficiency. This item is closed.

5. Piping Systems and Supports (50090)

During this inspection period, the NRC inspector made several inspection tours of the Unit 1 areas to review the installation of pipe supports. These inspections led to several findings. These findings appear to be the result of inadequacies in the inspection program. The discrepancies identified by the NRC inspector are listed below:

- a. MS-1-00J-001-C72S - NPSI Component Support BBD-18, a welded beam attachment, has one of its ears bent out. This condition will increase the stress in the load pin. After identification by the NRC inspector, SWEC initiated NCR 89-01780 to evaluate the installed condition.
- b. FW-1-018-718-C72K - The NPSI clamp used in conjunction with a size 100 Pacific Scientific shock arrestor for this support does not have the plus or minus five degrees of angular rotation perpendicular to the axis of the pipe. It appears that the clamp in question is fabricated incorrectly. The distance between the ears of this clamp is 2 3/4 inches and the NPSI catalog states that this dimension should be 3 1/8 inches. While in this particular application there may not be a need for the full range of angular movement, this misfabrication could have generic implications.
- c. CT-1-038-418-C62S - The type "F" spring (used to support the pipe from below) on this support appears to be manufactured incorrectly. The load column upon which the pipe rests, which transfers the load to the spring assembly, is visibly skewed beyond the limits of the governing Specification ASTM-A-125.
- d. CS-1-002-700-C52S - One of the spring load couplings does not have a sight hole to enable inspection for proper thread engagement of the hanger rod.
- e. CC-1-258-003-C53R - The spherical bearing in the paddle of the sway strut on this support is almost completely dislodged from its intended position. This could cause

premature failure of the sway strut assembly; or if the spherical bearing were to become totally dislodged, the sway strut would no longer be able to perform its intended function.

- f. RC-1-135-004-C51K - The clamp for the size 10 snubber on this support appears to be manufactured incorrectly. The distance between the ears of the clamp is below the minimum specified in the Inspection Procedure AQP-11.3. In this instance, there may not be a functional impact; however, an NCR should have been written so that the generic implications could have been evaluated.
- g. CC-1-207-020-C53R - The strut on this support utilizes a 3/4-inch pin for the connection of the paddle to the clamp. The distance between the ears of the clamp as measured by the NRC inspector is 1 9/16 inch; the maximum allowed by the applicable QC procedure is 1 1/2 inch. This condition will increase the stress in the load pin beyond the amount analyzed by the manufacturer.
- h. FW-1-096-002-C62K - On this support, the clearance from the top of the pipe clamp to the body of the snubber appears to be inadequate. The NRC inspector measured this distance to be approximately 1/16 inch. This condition will restrict the angular rotation of the snubber along the axis of the pipe to less than the plus or minus five degrees. NPSI allows the application of snubbers with this type of clamp to be plus or minus 90 degrees from vertical along the axis of the pipe. As fabricated, this would not be physically possible. This condition appears to be caused by an excessively large distance from the centerline of the load pin to the edge of the pipe clamp. The QC inspection procedure gives the minimum value for this attribute but does not give a maximum value. Therefore, it appears that the pipe clamp is manufactured or designed incorrectly, and the inspection procedure is not adequate for identifying this condition.
- i. FW-1-096-002-C62R - The sway strut on this support utilizes a 3/4-inch load pin to connect the strut to the pipe clamp. According to the inspection procedure, the distance between the ears of the pipe clamp for this size sway strut should be a maximum of 1 1/2 inch. For this support, the NRC inspector measured this dimension to be 1 5/8 inch. Again, this condition could cause the stress in the load pin to be higher than the manufacturer has calculated.
- j. MS-1-340-001-C52S - The eyenut attaching the hanger rod on this support to the pipe clamp is bound against the



top of the clamp. In this condition, the thermal movement of the pipe will cause bending stresses in the hanger rod that have not been evaluated. This appears to have been caused by misfabrication of the pipe clamp.

- k. CC-1-269-700-C53A - One of the joints on this pipe anchor assembly was observed to have a fit-up gap which exceeded 1/16 inch. Review of the records for this anchor did not reveal any documentation that the weld size had been increased in accordance with the requirements of the weld procedure specification.
- l. MS-1-344-700-C52K - The NRC inspector observed that the spherical bearing in the paddle end of this snubber was completely dislodged. This condition could increase the dead band, the distance where the snubber would not resist any load, for this snubber to the point where it would be, in effect, inoperable.
- m. RC-1-018-038-C51K - This support is a size 3 mechanical snubber which utilizes a 3/4-inch load pin; according to AQP-11.3 the maximum distance between the ears of the pipe clamp for this size snubber is 1 1/2-inch. On this support, the NRC inspector measured this dimension to be 1 5/8 inch.
- n. FW-1-098-701-C62K - This restraint assembly utilizes two sway struts. On each of the sway struts the jam nut that locks the strut body in position were loose.
- o. MS-1-RB019-005-2 - The clamp ears on the assembly appear to be bent to less than the 5/8 inch specified as the minimum dimension between the ears of this size clamp. This could cause the angle of rotation to be reduced to less than plus or minus 5 degrees.
- p. CT-1-014-001-S22S - The spring on this support is mounted on a section of structural tubing with the hanger rod passing through a hole drilled in the tube. The NRC inspector observed that the threaded hanger rod was in contact with the tube at the edge of the hole. This may impair the function of the support, or may put bending stresses, which have not been evaluated, in the hanger rod if the thermal movement is in the direction of the existing interference.
- q. SI-1-070-006-S22R - The cotter pin on the pipe clamp load pin has not been spread.
- r. BR-X-106-064-S43R - The baseplate on this support is not grouted properly and violates perimeter contact

requirement. There appears to be some distortion due to welding.

- s. CS-1-908-702-S42R - The jam nut that locks the sway strut body in position is not tightened properly.
- t. SI-1-060-006-S42R - The ears of the sway strut clamp are not parallel to each other and the load pin is not parallel to the clamp bolt.
- u. CS-1-106-717-C42R - Cotter pin used to keep the load pin in place is missing.
- v. CS-1-106-723-C42R - Cotter pin used to keep the load pin in place is missing.

The above failures to properly inspect pipe supports or provide adequate inspection guidance constitute a violation of Criterion V (445/8912-V-03) and represent a significant weakness in the pipe support inspection program.

6. Plant Area Tours (50090, 49063, 37051)

At various times during the inspection period, the NRC inspectors conducted independent and planned regular backshift and weekend inspections of the Unit 1 reactor containment, safeguards, auxiliary, electrical control, and diesel generator buildings. Selected accessible rooms in all of these buildings were inspected to observe current work activities with respect to major safety-related equipment, electrical cable/trays, mechanical components, piping, welding, coatings, Hilti bolts, and removal of debris from seismic gap between buildings.

The NRC inspector observed some decline in the general housekeeping. TU Electric construction management were alerted to this observation. Specifically, the inspector observed papers and sunflower seeds inside structural tubing in the reactor building, as well as loose bolts, nuts, load pins and other hardware items in various locations.

7. Exit Meeting (30703)

An exit meeting was conducted March 7, 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.



During the exit meeting on March 7, 1989, TU Electric management expressed disagreement with our characterization of one of the violations written on the attached Notice of Violation. In the applicant's opinion, the errors detected by the NRC in SWEC's calculations for piping and pipe supports do not constitute a violation of Criterion III of 10 CFR 50, Appendix B. This Criterion states, in part, ". . . design control measures shall provide for verifying or checking the adequacy of design . . . ." Implicit in the requirement to establish these measures is that they be effectively implemented. Based on the extremely high rate of relatively obvious errors, it is our opinion that the implementation of the governing procedures for design control was inadequate.