TU ELECTRIC

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January 12, 1990

W. J. Cahill
Executive Vice President

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D. C. 20555

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NOS. 50-445 AND 50-446
NRC INSPECTION REPORT NOS. 50-445/8978; 50-446/8978
RESPONSE TO NOTICE OF VIOLATION

Gentlemen:

TU Electric has reviewed the NRC's letter dated December 13, 1989, concerning the inspection conducted by Mr. H. Livermore during the period October 4 through November 7, 1989. This inspection covered activities authorized by NRC Construction Permits CPPR-126 and CPPR-127 for CPSES Units 1 and 2. Attached to the December 13, 1989, letter was a Notice of Violation.

TU Electric hereby responds to the Notice of Violation in the attachment to this letter.

Sincerely,

William J. Cahill, Jr.

CBC/dj
Attachment

c - Mr. R. D. Martin, Region IV
Resident Inspectors, CPSES (3)

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NOTICE OF VIOLATION, ITEM A
(445/8978-V-01; 446/8978-V-01)

A. Criterion V of Appendix B to 10 CFR Part 50 as implemented by Section 5.0 of the TU Electric Quality Assurance Manual requires that activities affecting quality shall be prescribed by and accomplished in accordance with documented instructions, procedures, or drawings.

Design Basis Document (DBD)-CS-074, paragraph 4.3.2, denotes all load combinations, plus test conditions, that would be imposed on the containment liner and penetrations.

Contrary to the above:

(1) The fracture mechanics analysis in SWEC Calculation 16345/6-CS(B)-007, Revision 0, performed for TU Electric to evaluate the construction deficiency relating to not impact testing materials greater than 5/8-inch in thickness which are attached to the containment liner (Significant Deficiency Analysis Report CP-87-22), did not include loads which would induce tensile stresses in the liner such as would occur during the structural integrity and leakage testing of the containment liner.

(2) The fracture mechanics analysis in SWEC Calculation 16345-CS(B)-472, Revision 0, performed in response to Deficiency Report (DR) C-87-5161 to demonstrate that liner indications up to 1/2-inch long in liner insert full penetration butt welds would not propagate and affect the liner integrity did not include liner loads which would induce tensile stresses in the liner.

RESPONSE TO NOTICE OF VIOLATION, ITEM A
(445/8978-V-01; 446/8978-V-01)

TU Electric accepts the violation and the requested information follows.

1. Reason for the Violation

Material Engineers prepared calculations 16345-CS(B)-007 and 16345-CS(B)-472 using stresses provided by Civil/Structural Engineers who were cognizant of the containment liner design. The calcualtion for the design of the containment liner, 16345-CS(B)-028, had determined that the liner stresses (strains) associated with the test condition were considerably lower than for other loading combinations. The overlay and insert plates were designed based on the worst stress (strain) in the liner and the worst stress (strain) from the attachment load, both of which occur from normal service or faulted conditions. Thus, the stresses which were provided to the Materials Engineers did not explicitly address the test loads because other load combinations were deemed to envelope the test condition.

The NRC Inspection Report also indicated that the fracture mechanics calculations did not consider loads which could induce tensile stresses in the liner such as during predicted accident containment pressures up to 50 psig. These loads are not considered because the calculation for the containment liner demonstrates that the liner is in a state of compression for all loading combinations except the test condition. This occurs because the thermal loads, which are present concurrently with the accident pressure loads, induce compressive stresses which are greater in magnitude than the tensile stresses associated with the pressures.

2. Corrective Steps Taken and Results Achieved

Design Basis Document (DBD)-CS-074, is applicable to the design of the containment liner, liner insert plates, overlay plates, hatches and penetrations. To assess whether other calculations associated with this DBD explicitly considered test load conditions, calculations for these commodities were reviewed. This review confirmed that test load conditions were specifically addressed for the containment liner, hatches and penetrations calculations. However, the insert and overlay plate calculations did not explicitly address test load conditions for the reasons indicated in the "Reason for the Violation." Thus, the corrective actions for this violation address the fracture mechanics calculations referenced above and the calculations for overlay plates and insert plates.

Calculation 16345-CS(B)-483 was prepared to evaluate the stresses associated with the containment Structural Integrity Test (SIT) and Integrated Leak Rate Test (ILRT) for overlay plate and insert plate attachments. This calculation confirmed the judgment that the insert plate stresses resulting from the test condition are bounded by the stress used as input for calculation 16345-CS(B)-472, Revision 0. The insert plate stresses determined by calculation 16345-CS(B)-483 are also less than the allowable stress for the test condition, hence the insert plates are qualified for the test condition.

Calculation 16345-CS(B)-483 also demonstrates that the stresses in the liner due to the presence of overlay plates and test loads are within the test allowables. However, it does not demonstrate that the attachment weld stresses are bounded by the inputs used in calculation 16345-CS(B)-007, Revision 0. This condition was discussed with the NRC inspector and in lieu of performing additional finite element and fracture mechanics analyses, Amendment 78 to the FSAR includes a change (Licensing Document Change Request SA-89-764) to utilize exemptions from Charpy Impact Testing which are contained in the 1986 ASME Code. This edition of ASME Section III, Division 2, recognizes that if the service temperatures are above the Nil Ductility Transition Temperature (NDTT) by specified amounts, impact testing is not necessary. For the non-impact tested materials used at CPSES the governing service metal temperature specified by Subsection CC-2500 of the 1986 Code is 70°F.

The mean temperature during the 1983 Structural Integrity Test (SIT) and Integrated Leak Rate Test (ILRT) was 69°F, and during the 1989 ILRT the mean temperature was in excess of 80°F. The 1°F temperature difference between the 1983 tests and the 1986 Code requirement is deemed to be negligible. This conclusion is justified because the containment has successfully passed two ILRT's indicating the liner integrity has been maintained. In addition the fracture mechanics calculation (16345-CS(B)-007) demonstrates that potential defects in the attachment plates, if they exist, would not compromise liner integrity for all other design loading conditons. Actions have been taken to assure that future SIT/ILRT's will be conducted at ambient temperatures greater than 70°F. Since calculation 16345-CS(B)-007 was developed to assess the adequacy of non-impact tested materials attached to the liner, the above FSAR change eliminates the need to consider the test condition in the calculation.

Engineering has also prepared Calculation Change Notice (CCN) -006 against calculation 16345-CS(B)-027, Revision 0. This CCN specifically addresses the test conditions for overlay plate attachment welds and demonstrates that the stresses in the weld are within the code allowables. Based on this CCN it is concluded that the overlay plates are qualified for the test conditions.

3. Corrective Steps Taken to Avoid Further Violations

The fracture mechanics calculations identified by the NRC inspector were developed to resolve unique issues associated with the containment liner. Calculation 16345-CS(B)-483 has confirmed that test loads were enveloped by the load combinations considered for other DBD-CS-074 calculations, with the exception of calculation 16345-CS(B)-007 as discussed above, therefore TU Electric believes that this calculation weakness is isolated.

Civil/Structural engineering personnel responsible for performing design calculations have been reminded to explicitly address all load combinations required by the governing DBD in calculations.

As part of the TU Electric Corrective Action Program (CAP) the Technical Audit Program (TAP) included audits and surveillances to assess the design and hardware validation efforts. Extensive audit and surveillance activities were focused on the preparation and validation of engineering analyses and calculations in order to (1) verify establishment of the overall technical adequacy of the as-built design, (2) verify implementation of applicable design procedure or methodology, and (3) demonstrate compliance with specified design and licensing commitments and criteria. Calculations and analyses were examined for: validity and traceability of design inputs and loads; interfaces; proper application of design methodology (and/or procedure), correctness of analysis (including applicability, qualification, and use of computer programs/models utilized in the analysis); reasonableness of results in comparison to inputs; and adequacy of supporting documentation.

Based on the satisfactory results of the TAP audits and surveillances, TU Electric believes that further corrective measures are not necessary.

4. Date of Full Compliance

Full compliance has been achieved.

NOTICE OF VIOLATION, ITEM B
(445/8978-V-02)

B. Criterion III of Appendix B to 10 CFR Part 50 requires, in part, that measures shall be established to assure that applicable regulatory requirements and the design basis for those structures, systems, and components to which this Appendix applies are correctly translated into specifications, drawings, procedures, and instructions. The design control measures are required to provide for verifying or checking the adequacy of design. Design changes are required to be subject to design control measures.

Contrary to the above:

1. DCA 71228, Revisions 0 and 1, improperly authorized the removal of lugs from a pipe spool in the Chemical Volume and Control System piping system which were an integral part of the design of a pipe whip restraint.

2. Subsequently, five additional revisions, Revisions 2 through 6, to DCA 71228 were required to achieve a satisfactory design to correct the improper removal of the lugs.

RESPONSE TO NOTICE OF VIOLATION, ITEM B
(445/8978-V-02)

TU Electric accepts the violation and the requested information follows:

(Parts 1 and 2 of the violation are addressed separately in the following response.)

1. Reason for Violation

Part 1 The subject lugs were designed to prevent the associated section of Chemical and Volume Control System (CVCS) piping from slipping through a pipe whip restraint during a postulated high energy line break. The configuration of lugs and whip restraint is unique to this installation. Design Change Authorization (DCA) 71228 Revisions 0 and 1 were issued to remove the lugs to resolve an interference problem with a pipe support. Due to the unique configuration, engineering personnel who originated DCA 71228 Revisions 0 and 1 incorrectly concluded that the lugs were part of an abandoned pipe support.

Part 2 Revisions 2 and 3 to DCA 71228 were issued to correct the improper authorization to remove pipe lugs described in part 1 of this violation. Although Revisions 2 and 3 corrected the lug removal problem, they did not adequately address the pipe support interference which had caused Revisions 0 and 1 to be issued.

Revision 4 to DCA 71228 was issued to resolve the pipe support interference problems which had not been adequately addressed by Revisions 2 and 3.

Revision 5 to DCA 71228 was issued to correct a minor discrepancy (approximately 0.02 inch) in the size specified for the weld attaching the lug to the pipe.

Revision 6 to DCA 71228 was issued to facilitate installation of the lugs.

In summary, TU Electric considers that revisions 4, 5, and 6 to DCA 71228 do not represent examples of inadequate design control. TU Electric acknowledges that the engineering personnel involved did not adequately assure that Revisions 2 and 3 to DCA 71228 met the design objective of installing the pipe whip restraint while eliminating interference with the pipe support.

2. Corrective Steps Taken and Results Achieved

Part 1 The required lugs have been reinstalled on the CVCS piping.

Part 2 Revisions 4 and 5 to DCA 71228 were issued to correct the inadequacies in Revisions 2 and 3.

3. Corrective Steps Which Will Be Taken to Avoid Further Violations

Part 1 Due to the unique configuration of the whip restraint there are no generic implications for this part of the violation and therefore no preventative action is considered necessary.

Part 2 With one exception, the engineering personnel who were involved with Revisions 2 and 3 to DCA 71228 were also involved with Revisions 4 and 5. These personnel are therefore aware of the specific inadequacies of Revisions 2 and 3. To provide added emphasis on the need for adequate design control, those personnel who were involved in Revisions 2 and 3 and are still on site have been made aware of this violation.

4. Date When Full Compliance Will Be Achieved

Full compliance has been achieved for both Parts 1 and 2 of this violation.

NOTICE OF VIOLATION, ITEM C
(445/8978-V-03)

C. Criterion V of Appendix B to 10 CFR Part 50 states, in part, that activities affecting quality shall be prescribed by documented procedures of a type appropriate to the circumstances, and shall be accomplished in accordance with these procedures.

Section 6.2 of TU Electric Procedure ECE 5.01, Revision 0, "Design Control Program - General" requires that, "Design activities shall be accomplished in accordance with governing design control procedures such that design inputs are correctly translated into design documents . . . ."

Contrary to the above, numerous errors (over fifty) such as the incorrect identification and description of a type of pipe whip restraints were found in Specification 2323-SS-16B, Revision 2, and DCA 74249, Revision 7.

RESPONSE TO NOTICE OF VIOLATION, ITEM C
(445/8978-V-03)

TU Electric accepts the violation and the requested information follows.

1. Reason for Violation

A review of DCA 74249, Revision 7 and Specification 2323-SS-16B, Revision 2 conducted in response to the NRC Inspector's concerns identified a number of errors in the revised pages of Attachment 1 to Appendix E of the specification 2323-SS-16B, Revision 2. This attachment provides a tabulation of Unit 1 pipe whip restraints that are covered by the specification and identifies the active or inactive status, location, bounding problem number, type, applicable drawing, and gap data for each restraint. The attachment encompasses approximately 2300 attributes; approximately 85 errors were identified.

These errors occurred through oversight or lack of attention to detail on the part of the engineering personnel preparing and reviewing Specification 2323-SS-16B, Revision 2, and DCA 74249, Revision 7.

2. Corrective Steps Taken and Results Achieved

DCA 74249 has been revised to correct the identified errors.

The identified errors generally occurred in three categories of attributes; restraint number (e.g. MS-1-001-907-C77W should have been identified as MS-1-001-907-C67W), restraint type (e.g. MS-1-007-901-T57W was listed as type H but should have been listed as type B), and bounding problem number (e.g. the problem number for restraint SI-1-091-901-C47W was listed as 1-017 but should have been listed as 1-017C). These attributes are provided in the specification as general information and are not used in the performance of field work on restraints. Also, the restraint numbers and bounding problem numbers consist of several unique identifiers. For these reasons TU Electric considers that existing programs and procedures would preclude these documentation discrepancies from causing inadequate restraint installations.

3. Corrective Steps Which Will be Taken to Avoid Further Violations

The Chief Engineer has issued a memo to engineering personnel reiterating the responsibilities and procedure requirements regarding DCA preparation and review, and emphasizing the need for attention to detail during the DCA preparation and review process.

4. Date When Full Compliance Will be Achieved

Full compliance has been achieved.