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January 26, 1990

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Executive Vice President

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

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSSES)
DOCKET NOS. 50-445 AND 50-446
REQUEST FOR ADDITIONAL INFORMATION
FSAR SECTION 3.8.1.2.5

Gentlemen:

On January 15, 1990, TU Electric notified the NRC of a change to the FSAR via TXX-90011 (pages 32 through 34 of the Attachment, FSAR Change Request Number 89-587). This change involved adding an exception to the ASME-ACI 359 document for liquid penetrant or magnetic particle examination of full penetration attachment welds (section 5523.1). As a result of subsequent discussions with the NRC staff regarding this change, the following additional information is provided.

The insert plates for the containment liner, which contain the full penetration attachment welds, were fabricated by CB&I in their shop to the requirements of Gibbs & Hill Specification 2323-SS-14. Although CB&I complied with the specification requirements (which only required visual inspection of the welds), the welds were not inspected in accordance with the code as specified in the FSAR. ASME-ACI 359 section CC-5523.1, states that all full penetration welds shall be examined by either magnetic particle or liquid penetrant examination and that all linear indications shall be removed and repaired. This condition was noted in NRC Inspection Report 50-445/89-33; 50-446/89-33. Additionally, Amendment 68 of the FSAR stated that only indications with major dimensions greater than 1/16" are considered relevant.

As a corrective action for the programmatic deficiency (lack of NDE), a multi part program was established to determine the acceptability of the installed components. This program consisted of 1) performing a review of the quality of CB&I's weld process, 2) performing an inspection of a portion of the welds to establish objective evidence of the frequency and type of indications, 3) performing a fracture mechanics and design stress analysis to determine a limiting linear flaw, 4) assessing the statistical confidence level for the overall weld quality of the unexamined welds based on the inspections, 5) verifying that the analysis is correct by reperforming a magnetic particle test on the three indications previously identified (and discussed further below), after the next Integrated Leak Rate Test (ILRT) (as physical confirmation of the analysis).

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As discussed in TXX-90011, a review of the quality of CB&I's weld process was performed and a portion of the liner plate welds was examined using the magnetic particle technique. The welds can be considered a homogeneous population by reason of their physical configuration, mode of fabrication and fabricator. The welds for all the liner plates in question were made in a shop environment using the same welding procedures. In addition, these welds have the same material properties and level of quality. Also, the fabricator's QA Welding Supervisor visually inspected these welds. Therefore, these inspections provide a reasonable assessment of the overall quality of the welds. CB&I is an established vendor with a long and successful history of service to the nuclear industry in this area.

A portion of the accessible welds was examined by the magnetic particle method. The examinations found three relevant indications (1/8", 1/4", and 1/2" in length). A conservative fracture mechanics analysis determined the critical crack size would be 1" in length based on the weld joint configuration, materials, stress state, cyclic loading, and worst location of postulated defects. The magnetic particle inspection and results were discussed in NRC Inspection Report 50-445/89-48; 50-446/89-48. NRC Inspection Report 50-445/89-53; 50-446/89-53 verified that QA was involved in the original visual inspections for the insert plate attachment welds.

A calculation was performed to provide a statistical confidence level of the overall quality of the welding process based on the inspections above. The calculation concluded that the inspections provided a high confidence level that the unexamined attachment welds in the balance of the liner plates will not have indications greater than 1/2" in length. Since the conservative analysis has determined that the critical flaw is 1" in length which is twice the largest observed indication, the probability of a flaw exceeding 1" in length is extremely small. The sample size is adequate when considering the guidelines of MIL-STD-105D, April 29, 1963, "Sampling Procedure and Tables for Inspection by Attributes." For large populations, the standard typically uses sample sizes which are very small percentages of the total population. Based on the basic quality of the welding process as performed by CB&I, and as confirmed by the inspections performed above, TU Electric is confident that the overall weld quality for these insert plates is adequate to assure performance of the liner's structural and leak tight functions.

The completed pressure tests (one Structural Integrity Test (SIT) and two ILRT's) provide additional evidence that the welds are adequate to assure performance of the liner's structural and leak tight functions. It should be noted that the SIT and ILRT's cause the containment liner to be in a state of tensile stress which would tend to open any potential flaws. During normal operating and accident conditions, the liner is in a state of compression due to the containment internal temperatures causing the liner to expand against the reinforced concrete. This compressive stress inhibits the opening of

flaws, thus the SIT and ILRT's represent a condition that can be used to assess the impact of any welding problems and appropriately form a bound for the loadings used in the fracture mechanics analysis. The satisfactory completion of these tests provides strong evidence the welds are adequate to assure the liner will perform it's structural and leak tight functions.

In addition, to provide added assurance and objective evidence that the analyses are correct, TU Electric will perform a magnetic particle examination of the three indications discovered by the above inspections to verify that the liner's structural integrity and leak tight function have not been degraded. This magnetic particle examination will be made after the next three ILRT's and then every second ILRT so that the effect of the bounding condition load from the ILRT can be assessed.

TU Electric has determined that there is reasonable assurance that the insert plate welds are of an acceptable quality to adequately assure performance of the safety function of the containment liner. This conclusion is based on 1) the quality welding process implemented by CB&I for the welds, 2) the inspections described above, 3) a calculation establishing that linear indications less than or equal to 1" are acceptable, 4) a calculation performed to estimate a statistical confidence level for the overall weld quality of the unexamined welds based on the inspections, 5) the satisfactory completion of the SIT and two ILRT's, and future magnetic particle examinations of the three existing indications.

The results of the above analysis and inspection resolves the deficiencies regarding the subject CB&I insert plates. Modification/additions to the liner plates (including CB&I plates) performed after June 1989, will be in accordance with the existing licensing commitments.

Should you have any questions regarding this submittal, please contact Carl Corbin at (214) 812-8859.

Sincerely,

William J. Cahill, Jr.

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