TU ELECTRIC

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June 21, 1991

William J. Cahill, Jr.
Executive Vice President

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

SUBJECT: COMANCHE PEAK STEAM ELECTRIC STATION (CPSES)
DOCKET NO. 50-445 AND 50-446
AUXILIARY FEEDWATER SYSTEM CHECK VALVES
SDAR CP-89-015 (SUPPLEMENTAL REPORT)

REF: TU Electric letter logged TXX-90253 from William J. Cahill, Jr. to NRC dated July 27, 1990.

Gentlemen:

In the referenced letter, TU Electric committed to replace the swing arms in all Borg Warner/International Pump, Inc. (BWIP) check valves in Unit 1 and Common systems during the first three refueling outages. Since that time, additional material testing and analyses of the swing arms has been performed by Southwest Research Institute (SwRI). In light of the testing and analyses performed by SwRI, TU Electric has concluded that the installed swing arms are suitable for long term service and there is no significant safety benefit associated with accelerated replacement.

Representatives from TU Electric met with the NRC Staff in Rockville, Maryland on June 12, 1991. The purpose of the meeting was for TU Electric to discuss the additional material testing and analyses performed by SwRI and to request that relief from the original commitment be granted soon enough to be incorporated into the planning stages of the first refueling outage for Unit 1. This letter summarizes the relief requested and the reasons for the request.

When the failure of the swing arm in the Service Water System occurred in 1989, APTECH Engineering Services, Inc. was contracted to perform testing and analyses of the failed swing arm and other intact swing arms. TU Electric had concluded from APTECH's analyses that the swing arms were acceptable for service, but contracted SwRI to perform more comprehensive testing and analyses. These tests and analyses are described in SwRI's final report, a copy of which is enclosed.

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TU Electric has reviewed the testing and analyses performed by SwRI and has documented that evaluation in engineering report, ER-ME-057, "Testing and Analysis of Commercial-Grade Swing Arms in Borg-Warner Swing Check Valves," a copy of which is also enclosed. In summary, there are five reasons why TU Electric has concluded that the currently installed arms are acceptable for long term service:

1. The installed arms have been inspected for surface flaws in accordance with a comprehensive screening process. Swing arms which did not meet the acceptance criteria of the screening have been removed from service.

2. The fracture toughness of the swing arms, based on a statistically representative sample of sixteen arms, exceeds the stress intensity generated by the worst observed flaw during a design basis check valve closure. Conservatisms used in determining the values that were compared included: postulation that the flaw is at the location of highest stress, in the worst orientation, and surface connected; fracture toughness at a calculated lower bound which was well below any actual measured fracture toughness; application of a dynamic correction factor (approximately 20% reduction) to the fracture toughness to account for the high strain rate during a valve closure; and use of calculated bending stresses during a valve closure that are estimated to exceed actual accident loads by a significant margin.

3. APTECH concluded that the residual stress observed in the one failed swing arm, which was estimated to have been 40-95 ksi tension, contributed significantly to the failure of this swing arm. Only negligible residual stresses, ranging from 0 to 4 ksi, were present in the sixteen swing arms examined by SwRI.

4. The Service Water System has the environment most likely to promote stress corrosion cracking. All of the swing arms in the Service Water System have been replaced with upgraded, investment cast swing arms to provide additional margin against stress corrosion.

5. APTECH reviewed the Nuclear Plant Reliability Data System (NPRDS) for failures. NPRDS documented approximately 600 BWIP check valves in service, totaling 7 million hours of operation, with no similar failures.

In addition to the material testing and analyses demonstrating that the installed swing arms are acceptable for long term service, there are additional reasons for not replacing the swing arms on an accelerated schedule. The additional reasons are:

1. In previous letters, TU Electric described in detail hardware modifications and procedural enhancements which assure that BWIP check valves are reassembled with correct tolerances. Installing new swing arms alters the internal geometry, requiring recalculation of bonnet height, and retesting of the check valves. The check valves are performing very well as currently installed and tested.

2. The plant systems must be aligned in other-than-normal configurations to perform the swing arm replacements during the refueling outages. TU Electric would prefer to reduce the number of plant manipulations and avoid other-than-normal system configurations.

3. The disc/stud assembly that attaches the disc to the swing arm has a welded nut to ensure component integrity. This weld may be ground out and rewelded only three times due to potential sensitization of the stud. Some of the remaining BWIP check valves have been reworked such that this weld is at this limit. Replacement of the swing arm would also necessitate replacement of the stud.

4. The upgraded investment cast swing arms are not significantly different metallurgically from the original swing arms. Since all the Service Water System swing arms have already been replaced with upgraded swing arms to take advantage of the additional margin against stress corrosion cracking, further replacements do not significantly increase plant reliability or safety.

5. Some of the remaining valves are in radiation areas; therefore, consistent with plant ALARA procedures and NRC guidance, suspending accelerated replacement will prevent unwarranted personnel radiation exposure.

In summary, the material testing and analyses have demonstrated that the swing arms currently installed are suitable for long term service. Replacement of the swing arms involves a considerable amount of outage resources with no measurable increase in plant safety or reliability. For these reasons, TU Electric is requesting to replace the swing arms when required by normal maintenance practices rather than at the accelerated rate originally committed.

TU Electric recognizes that a final decision by the NRC on this issue may not be feasible prior to Unit 1's first refueling outage. In order to minimize the expenditure of resources, plant manipulations, and personnel exposure, TU Electric requests that pending final resolution, the NRC consider an interim decision which revises the commitment schedule such that the accelerated replacement need not commence until the second refueling outage.

Sincerely,

William J. Cahill, Jr.

By: D R Woodlan

D. R. Woodlan
Docket Licensing Manager

DNB/dnb
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