UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 11, 1993

Docket No. 50-397

Mr. G. C. Sorensen, Manager
Regulatory Programs
Washington Public Power Supply System
3000 George Washington Way
P. O. Box 968
Richland, Washington 99352

Dear Mr. Sorensen:

SUBJECT: REVIEW OF INSPECTION REPORT ON A FLAW IN REACTOR RECIRCULATION PIPING AT WNP-2 (TAC NO. M86491)

We have completed our review of the information provided in your letter dated May 21, 1993 regarding the reinspection results and analysis of a flaw in recirculation piping weld 20RRC(6)-8. Based on the inspection results and analysis, the Supply System requested NRC approval for the restart of WNP2 from the current refueling outage (R-8) with the weld 20RRC(6)-8 in the as-is configuration.

The flaw in weld 20RRC(6)-8 was found during the 1991 refueling outage (R-6) and was initially reported to have a depth of 0.15 inch (about 1 inch in wall thickness) and a length of 4.5 inches. Reexamination of the same weld at the 1992 refueling outage (R-7) found the depth of the flaw had increased from 0.15 inch to 0.17 inch with no change in length dimension. During the current refueling outage (R-8), the Supply System reexamined the subject weld and reported that there was no significant change in the flaw size. The flaw size was reported to be 0.175 inch in depth and 3.6 inches in length. The shorter length (3.6 inch) reported in this outage was based on a reference gain recommended by EPRI for IGSCC length detection. The previously reported flaw length (4.5 inches) was determined based on the signal disappearing from the baseline. The Supply System also reported that in all examinations the UT signals did not exhibit IGSCC characteristics. In summary, the inspection results have shown that there was no significant flaw growth in weld 20RRC(6)-8 during the last two fuel cycles.

The the Supply System performed a fracture mechanics analysis of the flaw using the NASCRAC code. The results of the licensee's analysis showed that it would take about six years of operation to reach the maximum Code allowable depth of 0.62 inches. Additional information regarding the licensee's analysis was obtained during a conference call held on June 1, 1993, and supplemental materials were faxed to NRC on June 2, 1993. The supplemental materials showed that the licensee's analysis was based on a model assuming a semi-elliptical circumferential surface crack in a cylinder, which is less conservative than that recommended in NUREG-0313, Revision 2. The staff performed an independent calculation of the crack growth using influence functions as recommended in NUREG-0313, Revision 2, which was based on a model

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assuming a 360 degrees circumferential crack. The results of the staff's calculations showed that a crack depth of 0.62 inches will be reached after about 4 years of operation. In view of the uncertainties in stress analysis and UT examinations, the staff feels it is prudent to use a more conservative model in the flaw evaluation.

Based on a review of the licensee's inspection results and our independent crack growth calculations, the staff concludes that WNP-2 can return to safe operation until the next refueling outage as the structural integrity of weld 20RRC(6)-8 would be maintained. Based on the different results obtained between the code used by the Supply System and the code used as discussed in NUREG-0313, Revision 2, we request that the Supply System reevaluate their code, and use a model that provides equivalent results to the model in NUREG-0313 that assumes a 360 degree circumferential crack.

Sincerely,

James W. Clifford

James W. Clifford, Senior Project Manager
Project Directorate V
Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

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Sincerely,

Original signed by:

James W. Clifford, Senior Project Manager
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Division of Reactor Projects III/IV/V
Office of Nuclear Reactor Regulation

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Washington Public Power Supply System

WPPSS Nuclear Project No. 2
(WNP-2)

cc:

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