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SUBJECT: Provides response to GL 94-03, "Integranular Stress Corrosion Cracking of Core Shrouds in BWRs."

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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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January 15, 1996
GO2-96-010

Docket No. 50-397

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

Gentlemen:

Subject: **WNP-2, OPERATING LICENSE NPF-21**
AMENDMENT TO GENERIC LETTER 94-03 RESPONSE

References:

1) NRC Generic Letter 94-03, dated July 25, 1995, "Intergranular Stress Corrosion Cracking of Core Shrouds in Boiling Water Reactors"

2) Letter GO2-94-202, dated August 24, 1994, JV Parrish (SS) to NRC, "Response to Generic Letter 94-03, Intergranular Stress Corrosion Cracking of Core Shrouds"

3) Letter GI2-95-114, dated May 8, 1995, NRC to JV Parrish (SS), "NRC Closeout of Generic Letter 94-03, Intergranular Stress Corrosion Cracking of Core Shrouds for the Washington Public Power Supply System Nuclear Project No. 2"

4) Letter, dated April 21, 1995, C Terry (BWRVIP) to NRC, "BWR Core Shroud Inspection and Evaluation Guidelines, Revision 1"

5) NRC letter, dated June 16, 1995, NRC to JT Beckham (BWRVIP), "Evaluation of BWR Core Shroud Inspection and Evaluation Guidelines, GENE-523-113-0894, Revision 1, dated March 1995, and BWRVIP Core Shroud NDE Uncertainty & Procedure Standard, dated November 22, 1994"

This letter provides the WNP-2 amended response to Generic Letter 94-03. In our original response (Reference 2) the Supply System stated that a follow-up inspection of the accessible circumferential stainless steel core shroud welds would be performed during the Spring 1996 (R-11) refueling outage. In section 3.0 of Reference 3 the staff concluded that "an inspection should be performed no later than the first outage after the plant surpasses eight on-line years

of operation." The staff went on in section 4.0 to state "the licensee indicated in their response that they may adjust their core shroud inspection schedule and scope per guidance from the BWRVIP. At present, the NRC has not approved the inspection guidelines proposed by the BWRVIP." The staff subsequently documented their endorsement of the BWRVIP guidelines in Reference 5 when they stated in section 4.0 "The subject reports and their supplements are intended to provide guidance to all BWR licensees for the assessment of their core shroud." As outlined below, the Supply System has determined, based on the guidance provided by References 4 and 5, that additional inspection of the core shroud should be scheduled for performance during the Spring 1998 (R-13) refueling outage.

This core shroud inspection rescheduling is supported by BWR (Boiling Water Reactor) inspection results for domestic BWR 5/6 plants, previous WNP-2 (BWR-5) core shroud inspections, low carbon stainless steel materials and the WNP-2 water chemistry history. Limited UT (Ultrasonic) inspections performed on two other BWR 5/6 core shrouds of the same vintage as WNP-2 have revealed no cracking. WNP-2 performed a limited inspection during the Spring 1994 (R-9) refueling outage and found no cracking.

Since the inception of power operation, WNP-2 water conductivity has averaged below the BWR Water Chemistry Guidelines Action Level 1 value of 0.30 μS/cm. The average conductivity for the first five operating cycles at WNP-2 was 0.242 μS/cm as reported in Reference 2 and the average conductivity for the second five cycles was 0.176 μS/cm. As stated by the staff in section 2.2 of Reference 3, "the [WNP-2] reactor coolant conductivity has been much better, on average, than other operating BWRs." As noted in Reference 2, WNP-2 has a low residual 304L stainless steel core shroud which was fabricated and installed at the vessel manufacture's shop as opposed to being installed in the field. Based on our water chemistry history, and the core shroud materials/fabrication history data and industry experience, the susceptibility of the WNP-2 core shroud to intergranular stress corrosion cracking (IGSCC) would be expected to be low, as outlined in Section 2.1 of Reference 4. This was confirmed by the results of the WNP-2 ultrasonic inspection of the H-3 weld (high fabrication stress) and the H-4 weld (high fluence) during the R-9 refueling outage, in which no evidence of surface or volumetric cracking was identified.

As outlined in section 2.1 of Reference 4, IGSCC is unlikely in plants with less than 9.5 on-line years, although plants where significant core shroud cracking has been identified are generally those where stringent water chemistry requirements have not been adhered to throughout the life of the plant. Since the susceptibility of the WNP-2 core shroud welds to IGSCC is low from the viewpoints of material properties and water chemistry, the value of 9.5 on-line years is taken as the threshold at which IGSCC might be expected to be first detectable at WNP-2. WNP-2 will be at approximately 8.6 on-line years at the Spring 1996 (R-11) outage, 9.4 on-line years at the Spring 1997 (R-12) outage, and 10.2 on-line years at the Spring 1998 (R-13) outage. However, performing an inspection too early in the life of WNP-2 would not be expected to provide a reliable indication of the future susceptibility of IGSCC occurring.

Because the Spring 1994 (R-9) outage inspection of the welds identified no cracking of the most susceptible welds, and the average water conductivity has been below the BWR Water Chemistry Guidelines Action Level throughout plant life thereby limiting the driving force for IGSCC, significant cracking is not expected in either the welds inspected during the R-9 outage or in the less susceptible welds that would be covered under the program recommended by Reference 4. Therefore, rescheduling the limited core shroud inspection from the Spring 1996 (R-11) outage to the Spring 1998 (R-13) outage, which will be the first outage following the 9.5 year threshold, is technically justified.

The Supply System has concluded that continued safe operation of WNP-2 through the Spring 1998 (R-13) outage will occur without additional core shroud inspections. This conclusion is based on: 1) results of the core shroud inspections performed at WNP-2 and other domestic BWR 5/6 plants, 2) 304L metal used for shroud fabrication, 3) core shroud fabrication and installation technique, 4) plant water chemistry history, 5) low susceptibility to significant cracking, 6) low projected crack propagation rates, and 7) training provided to the operations personnel to make them aware of the potential for core shroud cracking. The Supply System has reviewed the safety assessment provided as Attachment 1 to Reference 2 and concluded that the conclusions therein regarding safe operation are valid through the Spring 1998 (R-13) outage. Therefore, the core shroud limited inspection recommended by Reference 4 is being rescheduled for the Spring 1998 (R-13) refueling outage.

Should you have any questions or desire additional information regarding this matter, please call me or Mr. Dave Swank at (509) 377-4563.

Sincerely,

J. V. Parrish (Mail Drop 1023)
Vice President, Nuclear Operations

JAD/lm

cc: LJ Callan - NRC RIV
KE Perkins, Jr. - NRC RIV, Walnut Creek Field Office
NS Reynolds - Winston & Strawn
JW Clifford - NRC
DL Williams - BPA/399
NRC Sr. Resident Inspector - 927N

STATE OF WASHINGTON)
)
COUNTY OF BENTON)

Subject: Amendment to Generic Letter
94-03 Response

I. J. V. PARRISH, being duly sworn, subscribe to and say that I am the Vice President, Nuclear Operations for the WASHINGTON PUBLIC POWER SUPPLY SYSTEM, the applicant herein; that I have the full authority to execute this oath; that I have reviewed the foregoing; and that to the best of my knowledge, information, and belief the statements made in it are true.

DATE 15 JAN, 1996

J. V. Parrish, Vice President
Nuclear Operations

On this date personally appeared before me J. V. PARRISH, to me known to be the individual who executed the foregoing instrument, and acknowledged that he signed the same as his free act and deed for the uses and purposes herein mentioned.

GIVEN under my hand and seal this 15 day of January 1996.

Notary Public in and for the
STATE OF WASHINGTON

Residing at Benton County

My Commission Expires 4/28/98