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SUBJECT: Responds to Generic Ltr 88-01, "NRC Position on IGSCC in BWR.  
 Austenitic Stainless Steel Piping."

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WASHINGTON PUBLIC POWER SUPPLY SYSTEM

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P.O. Box 968 • 3000 George Washington Way • Richland, Washington 99352

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July 26, 1988  
G02-88-164

Docket No. 50-397

U.S. Nuclear Regulatory Commission  
Attn: Document Control  
Mail Station P1-137  
Washington, DC 20555

Subject: NUCLEAR PLANT NO. 2  
SUPPLY SYSTEM'S RESPONSE TO NRC'S GENERIC LETTER 88-01

- References: 1) Letter G02-84-364, G. C. Sorensen to Mr. Darrell G. Eisenhut, dated May 30, 1984, "Supply System's Response to NRC's Generic Letter 84-11."
- 2) Letter G02-86-253, G. C. Sorensen to E. G. Adensam, dated March 24, 1986, "IHSI of Welds and Update of Status of IGSCC Mitigation."

This letter responds to Generic Letter 88-01, "NRC Position on IGSCC in BWR Austenitic Stainless Steel Piping" dated January 25, 1988. The Supply System has reviewed the austenitic stainless steel welds at WNP-2 against this Generic Letter and NUREG 0313, Revision 2, and will comply with the staff positions delineated in the Generic Letter to the extent described in this response.

The Supply System has kept the Commission appraised of its progress in mitigating IGSCC for non-conforming welds in References 1 and 2. The Supply System performed UT examinations for IGSCC detection during the first three refueling outages per Generic Letter 84-11. No IGSCC flaws have been detected.

This letter responds to the five specific items described on Page 3 of the Generic Letter.

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1. Measures Taken to Mitigate IGSCC

The following is a summary of the measures the Supply System has taken at WNP-2 to mitigate IGSCC. Details of these measures have been previously submitted to the Commission in References 1 and 2.

Pre-Operational

- o The core spray piping material outside the reactor pressure vessel (RPV) was changed from stainless steel to carbon steel. The piping inside the RPV is 304L.
- o The ten reactor recirculation (RRC) inlet nozzle safe-ends were replaced with 316L material.
- o Piping welds associated with the RRC safe-end change out were solution annealed and/or corrosion resistant clad (CRC).
- o Controls were placed on welding to reduce sensitization.
- o Induction Heating Stress Improvement (IHSI) was performed on 113 welds made of non-conforming material. These welds were not UT examined after IHSI, because they had not been in service and not subject to IGSCC.
- o The control rod drive recirculation line was deleted and the RPV nozzle capped with a carbon steel cap.
- o The RRC bypass lines were capped with CRC stainless steel caps.

Post-Operation

- o During the first refueling outage, the 35 remaining four-inch and greater non-conforming welds received IHSI. This occurred in April 1986, 16 months after commercial operation. The welds were UT examined by EPRI certified examiners before and after IHSI. No cracking was detected.
- o The two-inch RRC drain lines (15 welds) were replaced with 316L during the second refueling outage.



SUPPLY SYSTEM'S RESPONSE TO NRC'S GENERIC LETTER 88-01

Future Measures

o Repairs or Replacements

In the event it becomes necessary to repair or replace any additional stainless steel piping, the Supply System will incorporate appropriate state-of-the-art measures delineated in the NRC staff positions listed on page 2 of the Generic Letter.

o Hydrogen Water Chemistry (HWC).

The Supply System has reviewed the use of HWC at WNP-2 and has concluded that this method of IGSCC mitigation will not be implemented at WNP-2 at this time. The Supply System will continue to monitor industry experience with HWC as it has all IGSCC issues by continued participation in appropriate industry committees and workshops and by review of published literature.

o Reactor Coolant Chemistry.

The Supply System has adopted the BWR Normal Water Chemistry Guidelines, EPRI NP-4946-SR, for its chemistry control program at WNP-2.

2. Inservice Inspection Program

Response to Staff Position on Inspection Schedules.

The Supply System has reviewed the stainless steel piping welds at WNP-2 and has determined there are 202 welds within the scope of the Generic Letter. Fifty-four are Category A and 148 are Category B. Of the welds in Category B, 113 received Induction Heating Stress Improvement (IHSI) before operation and the remaining 35 received IHSI within two years of operation. Table 1 tabulates the 202 welds (first 9 entries) within the Generic Letter scope and defines the number to be examined as part of the augmented inspection program for IGSCC.

The Supply System takes exception to the requirement of note 1, Table 1 of the Generic Letter for welds receiving stress improvement prior to operation. The purpose of the UT examination is to detect IGSCC. Prior to operation, the welds are not subjected to the conditions conducive to IGSCC. Requiring a UT examination to detect IGSCC after a pre-service stress improvement (SI) would not increase the piping integrity or reliability.

At least 25% of the 148 Category B welds and 12% of the 54 Category A welds will be examined within the next six years. Within ten years of the next refueling outage at least 50% of the Category B welds and at least 25% of the Category A welds will be examined. This augmented ISI program will be implemented at the next scheduled refueling outage (Spring 1989). This schedule complies with the staff position on inspection schedules, except for post SI UT as described above.



Response to Staff Position on Inspection Methods and Personnel.

The examinations performed under the scope of the Generic Letter will comply with the requirements of ASME Section XI as committed to by the "WNP-2 Inservice Inspection Program Plan." The applicable Edition and Addenda is the 1980 Edition, Winter 1980 Addenda. This Code requirement has been augmented by the requirement to qualify the detailed procedure, equipment and examination personnel by the formal program conducted in accordance with the NRC/EPRI/BWROG Coordination Plan at the EPRI NDE Center in Charlotte, North Carolina. This complies with the staff position on methods and personnel.

Response to Staff Position on Sample Expansion.

If one or more cracked welds are found in Category A, B or C during a sample inspection, an additional sample of welds will be examined during that outage. The sample will contain the approximate same number of welds as the original sample.

Unless there exists a technical reason to select a different distribution, the additional sample will be similar in distribution (pipe size, system and location) to the original sample. If additional cracked welds are found, all welds in that IGSCC category will be examined unless the sample was chosen on a technical basis. In that case all the IGSCC category welds that meet that technical basis will be examined. This complies with the staff position on sample expansion. Although WNP-2 does not have any Category E or F welds at this time, the Supply System will comply with the staff's position on increased sample provisions if the situation becomes applicable.

3. Technical Specification

The Supply System does not see a need to revise the WNP-2 Technical Specification as recommended. The WNP-2 Inservice Inspection Program Plan is a detailed, comprehensive document containing all inservice inspection requirements. This document contains Section XI requirements, augmented NRC requirements and Supply System augmented requirements. This document has been submitted for NRC review and approval has been received. The Inservice Inspection Program for Generic Letter 88-01 has been revised to include all augmented requirements as committed to by this response. The revised program will be submitted to the NRC upon acceptance of this response to Generic Letter 88-01.



4. Leak Detection

Response to Staff Position on Leak Detection.

The Supply System leakage criteria per Technical Specification 3.4.3.2 is in agreement with the staff position on leak detection for Category A and B welds. In the event Category D, E, F, or G welds develop at WNP-2, the leak detection criteria will be evaluated for compliance with the staff position.

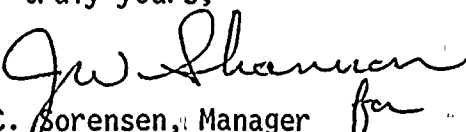
5. Reporting

Response to Staff Position on Reporting Requirements.

The Supply System will use ASME Section XI Section IWB-3600 of the 1986 Edition of ASME Boiler and Pressure Vessel Code for methods and criteria for crack evaluation and repair. The Commission will be notified if a flaw is found that does not meet Section XI, IWB-3500 criteria for continued operation without evaluation. Prior to resuming operation, an evaluation of the flaw justifying continued operation and/or the repair plans will be submitted to the Commission for approval. Resumption of operation will not be allowed until Commission approval has been granted. This complies with the staff position on reporting requirements.

The Supply System is well aware of the IGSCC problem and has taken positive measures toward dealing with this issue. IGSCC and related issues will continue to be closely monitored.

Very truly yours,

  
G. C. Sorensen, Manager  
Regulatory Programs

DPR/lw

cc: JB Martin - NRC RV  
NS Reynolds - BCP&R  
RB Samworth - NRC  
DL Williams - BPA/399  
NRC Site Inspector - 901A



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TABLE 1  
MITIGATION FOR IGSCC OF  
WNP-2 RCPP WELDS

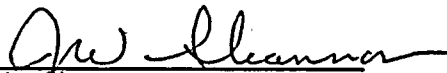
<u>Description</u>	<u>No. of Welds</u>	<u>Category</u>	<u>No. Scheduled for Examination every 10 years</u>
Butt welds - IHSI prior to operation	113	B	56
Butt welds - Solution heat treated 12-inch riser elbows	20	A	5
Sweepolets - Solution heat treated riser to header	8	A	2
Butt welds - Corrosion resistant clad, 12-inch riser to low carbon content safe-ends	10	A	2
Butt welds - RPV nozzle to low carbon 12-inch safe-end	10	A	3
Butt welds - RPV nozzle to low carbon 24-inch safe-end	2	A	1
Butt welds - Jet pump nozzle (N-9), low carbon	4	A	1
Sweepolet - IHSI within two years after operation	12	B	6
Butt welds - IHSI four-inch cross connect to RWCU within two years after operation	<u>23</u> 202	B	12
Butt welds - RRC two-inch system drain lines replaced with conforming material	15	N/A	less than four inch NPS. These welds are not in the scope of Generic Letter 88-01.

STATE OF WASHINGTON)  
COUNTY OF BENTON )

Subject: Generic Letter 88-01


I, J. W. Shannon, being duly sworn, subscribe to and say that I am the Deputy Managing Director for the WASHINGTON PUBLIC POWER SUPPLY SYSTEM, the applicant herein; that I have 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 7/26, 1988

  
J. W. Shannon  
Deputy Managing Director

On this day personally appeared before me J. W. Shannon 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 26 day of July 1988.

  
Notary Public in and for the STATE  
OF WASHINGTON

Residing at Richland, WA  
Dec 89



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