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United States Nuclear Regulatory Commission  
Document Control Desk  
Washington, DC 20555

HOPE CREEK GENERATING STATION  
FACILITY OPERATING LICENSE NO. NPF-57  
DOCKET NO. 50-354

**Subject: HOPE CREEK REACTOR VESSEL (N2G) RECIRCULATION INLET  
NOZZLE SAFE-END TO NOZZLE WELD JOINT WELD NON-  
DESTRUCTIVE EXAMINATION INFORMATION**

During a conference call between NRC NRR and Region I personnel and PSEG personnel conducted on October 31, 2007 a discussion was held concerning the Subject weld examinations. During that discussion NRC requested certain information concerning previous UT examinations of the weld.

Specifically NRC requested assurance that past examination results ensure the acceptability of the N2G recirculation inlet nozzle safe-end to nozzle weld joint. NRC also requested a comparison contrasting the N2G recirculation inlet nozzle safe-end to nozzle weld joint data to the same data for the N2A recirculation inlet nozzle safe-end to nozzle weld joint including the conclusions reached for both. This information is provided in the Attachment to this letter.

If you have any questions or require additional information, please contact Mr. Philip J. Duca at (856) 339-1640.

Sincerely,

A handwritten signature in cursive script that reads "George P. Barnes".

George P. Barnes  
Site Vice President – Hope Creek

Attachment

A047  
NRR

CC Mr. S. Collins, Administrator - Region I  
U. S. Nuclear Regulatory Commission  
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King of Prussia, PA 19406

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USNRC Senior Resident Inspector – Hope Creek (X24)

## **N2G RECIRCULATION INLET NOZZLE SAFE-END TO NOZZLE WELD JOINT NON-DESTRUCTIVE EXAMINATION INFORMATION**

The following information contained in this submittal is provided by request of the USNRC. The information contained will provide the basis for continued operation with no additional inspections required on the N2G Recirculation Inlet Nozzle.

1. The 2004 data from the nozzle side of the weld on N2G shows no issues with contact in the area of the reported flaw with the 45-degree Refracted Longitudinal (RL) search unit. The 45-degree RL examination was used to determine if flaws are inside surface connected.
  - The data from the examination conducted from the safe-end side does not show the indication, but the data is of reduced quality due to the effect of the weld crown. However, the procedure was fully qualified for a single side examination and the data collected from the nozzle side does not show evidence that quality was affected.
2. The N2G flaw was seen and reported in the 1995, 1999, 2000 and 2004 data sets with no change in depth or length that would be indicative of flaw growth.
3. The N2G flaw appears to be embedded in the 1995, 1999, 2000 and 2004 data sets with no connection to the inside surface. This is unlike N2A, which had an embedded flaw suspended over a signal response in the root area. The area between the embedded flaw and the root was masked by lift-off caused by excessive weld crown.
4. An independent review of the available data was performed by three different organizations, specifically PSEG, General Electric and EPRI. The independent conclusion reached by each party was that the N2G flaw as recorded in 1995, 1999, 2000 and 2004 has characteristics indicative of an embedded fabrication flaw and that there is no evidence present to suggest that it is connected to the inside surface. This conclusion is consistent with the conclusions that AREVA reached during their assessment prior to the 2007 outage, which stated there was no other suspected flaws present in dissimilar metal welds other than N2A.

### USNRC Question and PSEG Responses:

The question posed by the staff was what were the differences between the 1999/2000 N2A data and the 2004 N2G data?

- The equipment and analysis techniques used to examine N2G in 2004 were Performance Demonstration Initiative (PDI) qualified; the exams on N2A in 1999 and 2000 were not.
- Personnel qualification requirements for N2G UT examiners in 2004 required ASME Section XI Appendix VIII Supplement 10 endorsement (PDI). Personnel qualification requirements for N2A UT examiners in 1999 and 2000 required PDI Intergranular Stress Corrosion Cracking (IGSCC) endorsement in accordance with USNRC Generic Letter 88-01

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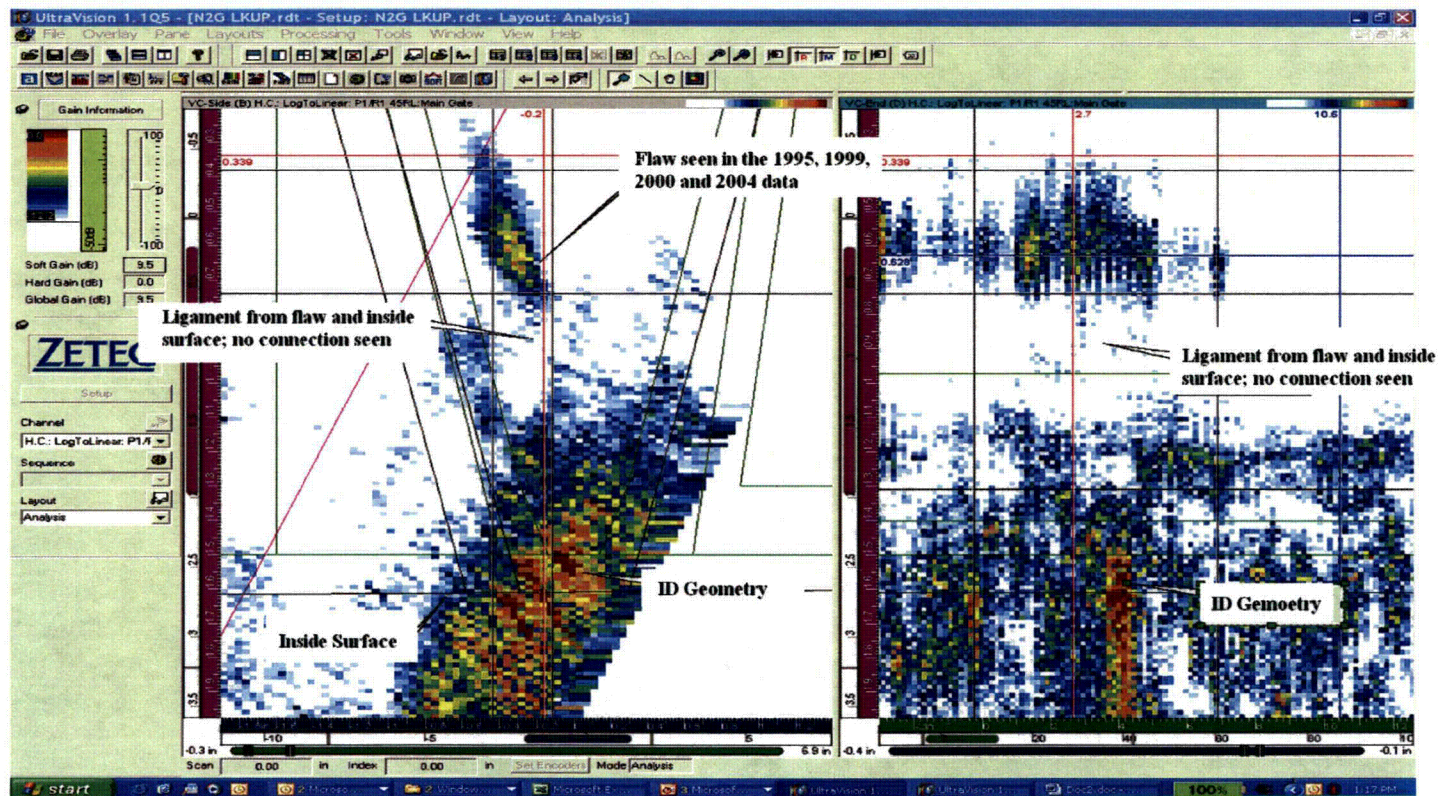
(NRC Position On Intergranular Stress Corrosion Cracking (IGSCC) In BWR Austenitic Stainless Steel Piping."

- The weld crown geometry in N2A was characterized as 1/32" out of tolerance prior to surface conditioning in 2007. Based on the 2007 reviews and quality checks of the 2004 examination data for N2G, the crown geometry did not appear to affect coupling.
- Prior to the implementation of Supplement 10, it was a common industry practice to use flat (non-contoured) search units. While the search units used in 1999 and 2000 were contoured, the small size of the search units would not have allowed adequate focusing to the inside surface based on information subsequently learned as a result of PDI qualification activities. During these examinations smaller search units were selected in an effort to maximize contact and lessen the effects of the weld crown on the examination. However, it is now known that this may have affected sensitivity on the inside surface. In contrast, the search units used for the 2004 examination were of a sufficient size to allow adequate focusing on the inside surface of the component and were ASME Section XI Appendix VIII Supplement 10 demonstrated.
- During the review of the 2004 examination data for N2G, the data collected from the nozzle side of the weld showed no issues with contact in the area of the flaw and also showed no evidence that the flaw was connected to the inside surface, unlike the data on the N2A nozzle. The data collected from the nozzle side on N2G showed that the flaw had a defined upper and lower extremity and no evidence that the data may have been compromised below it. (See figures following). The safe-end side data for N2G does not show the flaw, but the data is of reduced quality due to the effect of the crown. However, the procedure was qualified for conducting a single sided examination. The data that was collected from the nozzle side (i.e., single side) did not show evidence that it was detrimentally affected.

The included graphics show differences between N2A and N2G as displayed by the UT software.

**N2G RECIRCULATION INLET NOZZLE SAFE-END TO NOZZLE WELD JOINT  
NON-DESTRUCTIVE EXAMINATION INFORMATION**

# Evaluation of N2G 2004 Data

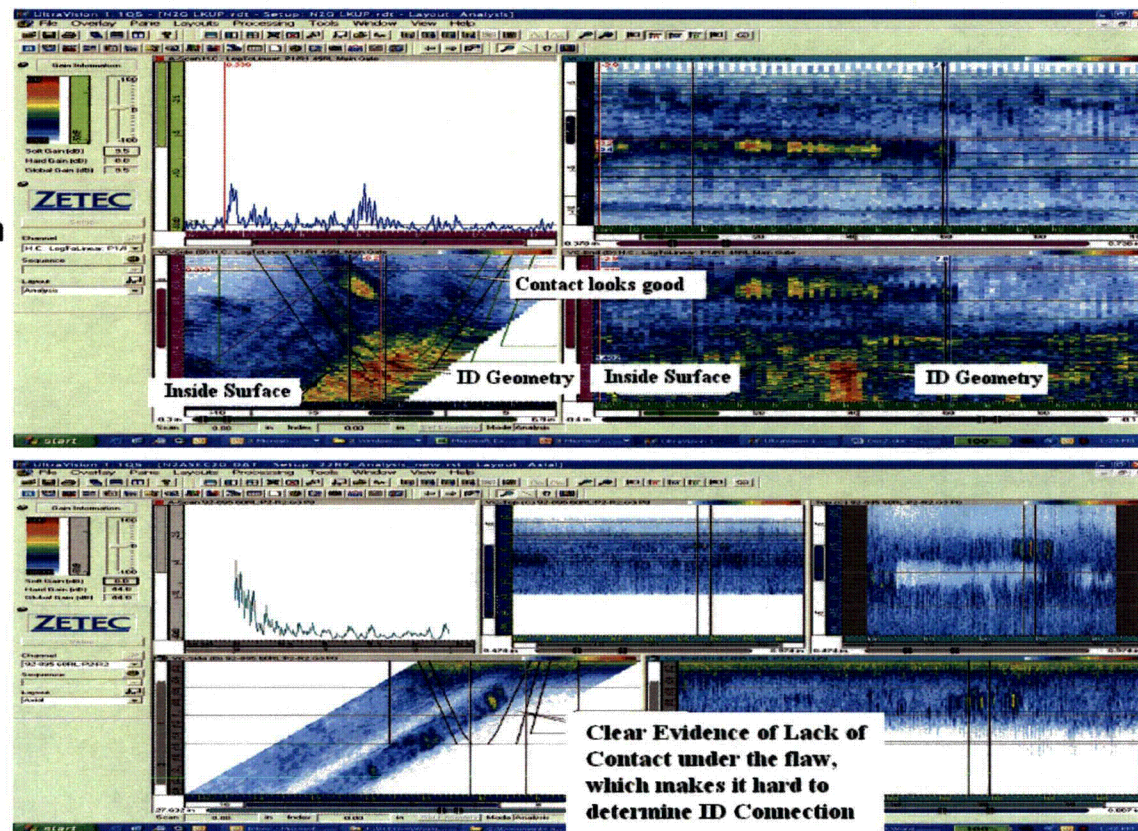




**N2G RECIRCULATION INLET NOZZLE SAFE-END TO NOZZLE WELD JOINT  
NON-DESTRUCTIVE EXAMINATION INFORMATION**

# Evaluation of N2G 2004 Data

Data collected on  
N2G from nozzle  
side of weld



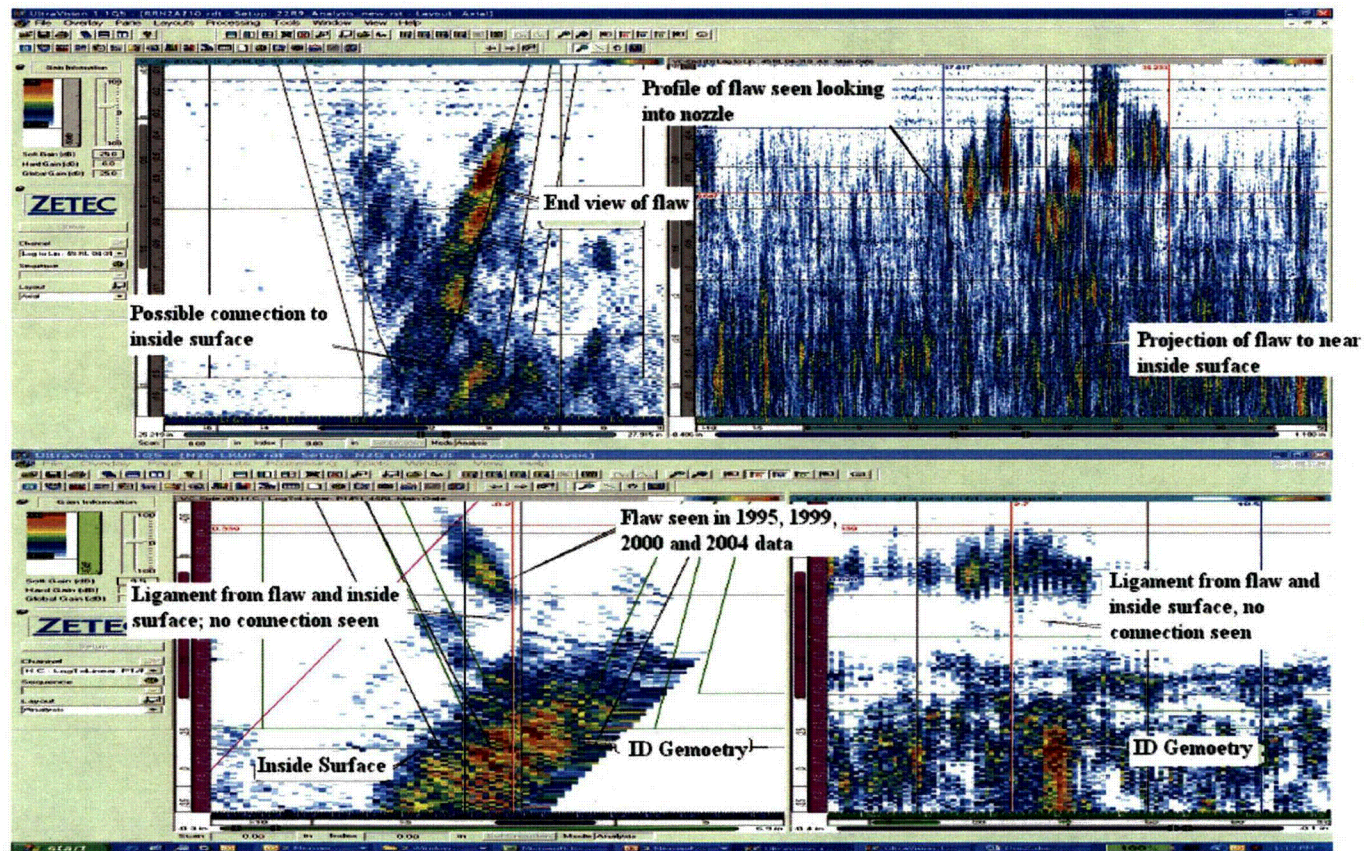
Example of  
Examination with  
Poor contact



N2G RECIRCULATION INLET NOZZLE SAFE-END TO NOZZLE WELD JOINT WELD NON-DESTRUCTIVE  
EXAMINATION INFORMATION

# Comparison of Flaw in N2A with Flaw in N2G

N2A



N2G