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United States Nuclear Regulatory Commission
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**REQUEST FOR ADDITIONAL INFORMATION
INSERVICE INSPECTION PROGRAM
RELIEF REQUEST HC-RR-B12
HOPE CREEK GENERATING STATION
FACILITY OPERATING LICENSE DPF-57
DOCKET NOS. 50-354**

**SUBJECT: REQUEST FOR ADDITIONAL INFORMATION RESPONSE - HOPE CREEK
GENERATING STATION RELIEF REQUEST HC-RR-B12 (TAC NO. MB8407)**

By letter dated April 14, 2003, PSEG Nuclear LLC (PSEG) submitted a request for relief from the required volumetric examination required by the American Society of Mechanical Engineers Code, Section XI, Table IWB-2500-1, Examination Category B-D, Item B3.100. The relief was requested pursuant to Title 10 of Code of Federal Regulations Section 50.55e(a)(3)(ii).

The Nuclear Regulatory Commission staff discussed the subject relief request with PSEG staff on June 18, 2003, and requested additional information be provided in response to their June 26, 2003 letter. Pursuant to that request, PSEG is submitting the enclosed response to the request for additional information.

Should you have any additional questions, please contact Mr. Howard Berrick at 856-339-1862.

Sincerely,


for G. Salamon
Manager – Nuclear Safety and Licensing

Enclosure

A047

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REQUEST FOR ADDITIONAL INFORMATION
HOPE CREEK GENERATING STATION RELIEF REQUEST HC-RR-B12

By letter dated April 14, 2003, PSEG Nuclear, LLC (PSEG) submitted a request for relief from the required volumetric examination required by the American Society of Mechanical Engineers (ASME) Code, Section XI, Table IWB-2500-1, Examination Category B-D, Item B3.100. The relief was requested pursuant to Title 10 of Code of Federal Regulations Section 50.55e(a)(3)(ii).

Specifically, the PSEG relief request proposes to perform an enhanced remote visual examination (EVT-1) technique of the surface M-N shown in ASME Section XI Figures IWB-2500-7 (a) through (d) as an alternative to ASME Section XI Table IWB-2500-1, Examination Category B-D, Item B3.100 requiring volumetric examination (Ultrasonic, UT) of the Inner Radius of Class 1 Reactor Pressure Vessel (RPV) Nozzles.

The enhanced remote visual examination will be performed upon the examination surface M-N to achieve essentially 40-60% coverage using 8x magnification video equipment to examine the inner radii. The resolution sensitivity for this remote examination will be established using a 1-mil diameter wire standard, similar to that used for other reactor pressure vessel internal examinations intended to detect cracking.

The NRC staff, in reviewing the submittal, has determined that the following information will be needed to complete the review:

NRC Inquiry #1:

Table 1 in the submittal includes the summary number and component identification of each nozzle to be examined. The type of nozzle to be examined is also important because nozzles subjected to large thermal gradients have a past history of thermal cracking. Describe the type (e.g., feedwater, recirculation inlet, jet pump instrumentation, etc.), of nominal inside diameter and material (e.g., carbon, nickel, etc.) of the nozzles included in the relief request.

PSEG Nuclear Response:

Table 1 below has been revised to include the requested information. The table now includes descriptions for the nozzle, nozzle dimensions and material composition.

Table 1									
Hope Creek RPV Nozzle Inner Radius Exams									
Summary Number	Component Identification	Estimated Coverage	Limitation Configuration	Material	Shell Thickness	Inner Bore Radius	Outer Blend Radius	Inside Bore Dimension	Outside Bore Dimension
100195	RPV1-N2A	50%	Thermal Sleeve/Jet Pump Riser 30° Recirculation Inlet Nozzle	SA508 Class 2	6.7"	1.772"	3.346"	11.496"	13.975"
100200	RPV1-N2B	50%	Thermal Sleeve/Jet Pump Riser 60° Recirculation Inlet Nozzle	SA508 Class 2	6.7"	1.772"	3.346"	11.496"	13.975"
100205	RPV1-N2C	50%	Thermal Sleeve/Jet Pump Riser 90° Recirculation Inlet Nozzle	SA508 Class 2	6.7"	1.772"	3.346"	11.496"	13.975"
100210	RPV1-N2D	50%	Thermal Sleeve/Jet Pump Riser 120° Recirculation Inlet Nozzle	SA508 Class 2	6.7"	1.772"	3.346"	11.496"	13.975"
100215	RPV1-N2E	50%	Thermal Sleeve/Jet Pump Riser 150° Recirculation Inlet Nozzle	SA508 Class 2	6.7"	1.772"	3.346"	11.496"	13.975"
100220	RPV1-N2F	50%	Thermal Sleeve/Jet Pump Riser 210° Recirculation Inlet Nozzle	SA508 Class 2	6.7"	1.772"	3.343"	11.496"	13.975"
100225	RPV1-N2G	50%	Thermal Sleeve/Jet Pump Riser 240° Recirculation Inlet Nozzle	SA508 Class 2	6.7"	1.772"	3.346"	11.496"	13.975"
100230	RPV1-N2H	50%	Thermal Sleeve/Jet Pump Riser 270° Recirculation Inlet Nozzle	SA508 Class 2	6.7"	1.772"	3.346"	11.496"	13.975"
100235	RPV1-N2J	50%	Thermal Sleeve/Jet Pump Riser 300° Recirculation Inlet Nozzle	SA508 Class 2	6.7"	1.772"	3.346"	11.496"	13.975"
100240	RPV1-N2K	50%	Thermal Sleeve/Jet Pump Riser 330° Recirculation Inlet Nozzle	SA508 Class 2	6.7"	1.772"	3.346"	11.496"	13.975"
100295	RPV1-N5A	40%	Thermal Sleeve and Sparger 120° Core Spray Inlet Nozzle	SA508 Class 2	6.9"	1.772"	3.071"	9.370"	11.496"
100300	RPV1-N5B	40%	Thermal Sleeve and Sparger 240° Core Spray Inlet Nozzle	SA508 Class 2	6.9"	1.772"	3.071"	9.370"	11.496"

Table 1 (cont'd)									
Hope Creek RPV Nozzle Inner Radius Exams									
Summary Number	Component Identification	Estimated Coverage	Limitation Configuration	Material	Shell Thickness	Inner Bore Radius	Outer Blend Radius	Inside Bore Dimension	Outside Bore Dimension
100320	RPV1-N8A	60%	Instrumentation Lines 112.5°- Jet Pump Instrumentation Nozzle	SA508 Class 2	6.85"	1.377"	1.968"	3.819"	5.197"
100325	RPV1-N8B	60%	Instrumentation Lines 292.5°- Jet Pump Instrumentation Nozzle	SA508 Class 2	6.85"	1.377"	1.968"	3.819"	5.197"
100400	RPV1-N17A	50%	Thermal Sleeve/ Collar & Bolt Assembly 45° LPCI Inlet Nozzle	SA508 Class 2	6.7"	1.772"	3.386"	11.378	13.976"
100401	RPV1-N17B	50%	Thermal Sleeve/ Collar & Bolt Assembly 135° LPCI Inlet Nozzle	SA508 Class 2	6.7"	1.772"	3.386"	11.378	13.976"
100402	RPV1-N17C	50%	Thermal Sleeve/ Collar & Bolt Assembly 225° LPCI Inlet Nozzle	SA508 Class 2	6.7"	1.772"	3.386"	11.378	13.976"
100403	RPV1-N17D	50%	Thermal Sleeve/ Collar & Bolt Assembly 315° LPCI Inlet Nozzle	SA508 Class 2	6.7"	1.772"	3.386"	11.378	13.976"

NRC Inquiry #2:

The licensee states the estimated coverage of each nozzle in Table 1 of its submittal. The list fails to state specific information about which area of the nozzle will be inaccessible to examination (e.g. top, side, bottom). The severity of thermal fatigue is dependent upon the circumferential location, thermal gradient and thermal sleeve leakage. Describe the portion of each nozzle that will be inaccessible to examination, providing a sketch if possible.

PSEG Nuclear Response:

In the original request PSEG stated that certain Hope Creek RPV Nozzle Inner radius exams contained configurations that impeded complete 100 percent visual examination coverage of the nozzle inner radius area surface M-N Hope Creek's Low Pressure Core Injection, Core Spray and Recirculation Systems inlet nozzles, and Jet Pump Instrumentation nozzles.

The enhanced remote visual examination will be performed upon the examination surface M-N to achieve essentially 40-60% coverage using 8x magnification video equipment to examine the inner radii. The resolution sensitivity for this remote examination will be established using a 1-mil diameter wire standard, similar to that used for other reactor pressure vessel internal examinations intended to detect cracking.

The area of the nozzle that is inaccessible is portrayed in Figure 1 below and should be considered to be 360° around the circumference of the nozzle inner radii area and limited to the approximate surface area shown within between M-N.

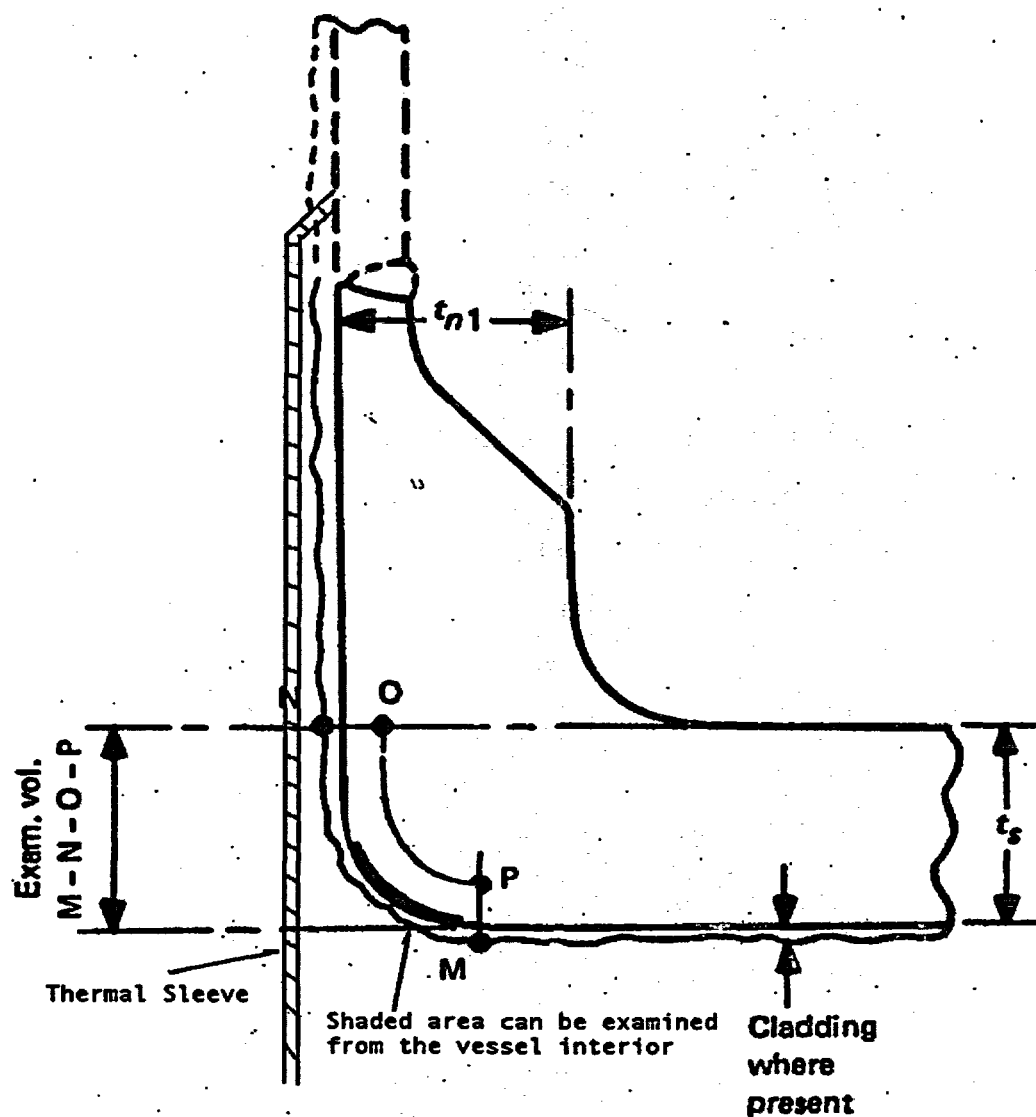


Figure 1

NRC Inquiry # 3:

In the alternative, the licensee states that the resolution sensitivity will be established using a 1-mil diameter wire standard that is similar to that used for other reactor pressure vessel internal examinations intended to detect cracking without stating which standards are being referenced. Explain the qualification process that will be used to demonstrate the 1-mil width sensitivity and the equipment used for the examination.

PSEG Nuclear Response:

The qualification process used to demonstrate the 1-mil width sensitivity is as follows: PSEG¹ will fabricate a Sensitivity, Resolution and Contrast Standard (SRCS) that is representative of the surface texture (reflectivity, color and finish) of the item to be examined. Targets of sufficient length to demonstrate the required resolution across the entire field of view of the camera system are affixed or embedded into the SRCS. At least one such target will be oriented in the horizontal direction and another target oriented in the vertical direction. The target is a wire of less than or equal to 1- mil width.

Equipment resolution and sensitivity is demonstrated prior to performing examinations. Resolution and sensitivity of the examination equipment and technique is considered adequate when the system is capable of discerning the required target (that is, the 1-mil diameter wire standard).

The requirements for the video equipment used in the examination will be consistent with BWRVIP-03, Revision 3, *Reactor Pressure Vessel and Internals Examination Guidelines, Section 2.5 Generic Standards for Visual Inspection of Reactor Pressure Vessel Internals, Components and Associated Repairs*. Parameters considered in the nozzle inner radii visual exams include lighting, depth of field, field of view, magnification, and speed of camera movement.

¹ PSEG Nuclear will contract an ISI vendor to perform the ISI inspections.