Calvert Cliffs Nuclear Power Plant

1650 Calvert Cliffs Parkway
Lusby, Maryland 20657

CENG
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CALVERT CLIFFS
NUCLEAR POWER PLANT

May 4, 2011

U. S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: Document Control Desk

SUBJECT: Calvert Cliffs Nuclear Power Plant
Unit No. 1; Docket No. 50-317
Response to Request for Additional Information: Relief Request for Modifications to Pressurizer Heater Sleeve and Lower Level Nozzle Penetrations (RR-PZR-01)

REFERENCES:

(a) Letter from Mr. J. J. Stanley (CCNPP) to Document Control Desk (NRC) dated January 31, 2011, Relief Request for Modifications to Pressurizer Heater Sleeve and Lower Level Nozzle Penetrations (RR-PZR-01)

(b) Letter from Mr. D. V. Pickett (NRC) to Mr. G. H. Gellrich (CCNPP), dated April 12, 2011, Calvert Cliffs Nuclear Power Plant, Unit No. 1, Request for Additional Information Re: Relief Request No. RR-PZR-01 for Modifications to the Pressurizer Heater Sleeve and Lower Level Nozzle Penetrations (TAC No. ME5423)

In Reference (a), Calvert Cliffs Nuclear Power Plant, LLC submitted an American Society of Mechanical Engineers Code Relief Request (RR-PZR-01), to perform modifications to Calvert Cliffs Unit 1 pressurizer heater sleeve and lower level nozzle penetrations in order to mitigate the propensity for primary water stress corrosion cracking occurring. In Reference (b), the Nuclear Regulatory Commission requested additional information be submitted to support their review of Reference (a). Attachment (1) provides the responses to the Nuclear Regulatory Commission's request for additional information contained in Reference (b). Attachments (2) through (5) contain proprietary analyses. An affidavit for all of the proprietary analyses is contained in Attachment (6). The affidavit is signed by AREVA and sets forth, with specificity, the considerations listed in 10 CFR 2.390(b)(4). Accordingly it is requested that the information that is considered proprietary by AREVA be withheld from public discourse. There are no non-proprietary versions of the analyses available.

A047
NRR

Should you have questions regarding this matter, please contact Mr. Douglas E. Lauver at (410) 495-5219.

Very truly yours,

James J. Stanley
Manager-Engineering Services

JJS/KLG/bjd

Attachments:
(1) Response to Request for Additional Information: Alternative Modifications to Unit 1 Pressurizer Heater Sleeve and Lower Level Nozzle Penetrations (RR-PZR-01)
(2) CCNPP-1 PZR Heater Sleeve & Plug Weld Anomaly Analysis (Proprietary)
(3) CCNPP-1 PZR Instrument Nozzle Weld Anomaly Analysis (Proprietary)
(4) CCNPP-1 PZR Heater Sleeve As-Left J-Groove Weld Flaw Evaluation for IDTB Repair (Proprietary)
(5) CCNPP-1 PZR Instrument Nozzle As-Left J-Groove Weld Flaw Evaluation for IDTB Repair (Proprietary)
(6) AREVA Affidavit for Proprietary Information

cc: **Without Attachments (2) through (5)**
D. V. Pickett, NRC
W. M. Dean, NRC
Resident Inspector, NRC
S. Gray, DNR

ATTACHMENT (1)

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION: ALTERNATIVE MODIFICATIONS TO UNIT 1 PRESSURIZER HEATER SLEEVE AND LOWER LEVEL NOZZLE PENETRATIONS (RR-PZR-01)

ATTACHMENT (1)

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION: ALTERNATIVE MODIFICATIONS TO UNIT 1 PRESSURIZER HEATER SLEEVE AND LOWER LEVEL NOZZLE PENETRATIONS (RR-PZR-01)

By letter dated January 31, 2011, Calvert Cliffs Nuclear Power Plant, LLC [CCNPP] submitted for NRC [Nuclear Regulatory Commission] review and approval Relief Request RR-PZR-01 to perform modifications to Calvert Cliffs Unit 1 pressurizer heater sleeve and lower level nozzle penetrations to mitigate the potential for primary water stress-corrosion cracking. The section and page numbers cited in the RAI [Request for Additional Information] questions below refer to RR-PZR-01.

RAI Question 1:

Section 1, Page 1, states that the new heater sleeve and instrument nozzle will be made of stainless steel type 316/316L. (1) Provide the inside and outside diameters (or the nominal diameter and wall thickness) of the new sleeve; (2) Section 4, page 4, second paragraph, states that "...Stainless steel 316 base material with less than 0.03% maximum carbon content, and ER309 weld material with 0.03% maximum carbon content, both of which are resistant to PWSCC [primary water stress corrosion cracking], will be used for the modifications. The stainless steel material to be used is dual certified as it meets both the low carbon content requirement of the "T" grade and the mechanical properties of the "non-L" grade material..." Describe how stainless steel 316 is combined with stainless steel 316L to achieve a dual certified material and (3) Clarify the "T" grade.

CCNPP Response RAI 1:

(1) New heater sleeve is approximately 1.66" outside diameter and 1.23" inside diameter within the bore.

(2) Stainless steel material to be used is Type 316L (with a maximum carbon content of 0.03%) having the mechanical properties of Type 316.

(3) "T" grade should have been "L" grade.

RAI Question 2:

Cracking has occurred in stainless steel components resulting from contact with halogens (such as chlorides and fluorides) or being sensitized. (1) Discuss whether Regulatory Guide (RG) 1.44, "Control of the Use of Sensitized Stainless Steel," will be followed in welding of the new sleeve. If yes, discuss the measures to minimize sensitization in the new sleeve per RG 1.44. Provide justification for any deviations from RG 1.44; (2) Discuss measures to limit the contact with halogens; and (3) Discuss pressurized-water reactor operating experience using the stainless steel heater sleeves in pressurizers.

CCNPP Response RAI 2:

(1) Since the stainless steel base material and weld filler are limited to 0.03% maximum carbon content, base material sensitization is not a concern and RG 1.44 is not a specified requirement. Also, since ambient temperature temper bead welding is performed, the heat input will be low, providing further assurance that base material sensitization will not occur.

(2) Cleaning procedures to be used will restrict contact and contamination of halogens and other contaminants on replacement items.

(3) All the Westinghouse pressurizer heater sleeves (heater wells) are stainless steel (either 304 or 316).

Calvert Cliffs 1 is aware of only a single adverse operating experience incident where a stainless steel heater sleeve failed due to stress corrosion cracking and it occurred at Braidwood Unit 1 (NRC Information Notice 2006-27, ML062490396). Starting in 2006, 25 plants visually inspected about 2000 stainless steel heater sleeves with no signs of leakage.

RAI Question 3:

Section 2, page 1, cited Code Case N-638-1 as the applicable code case. The NRC has approved Code Case N-638-4 as documented in NRC RG 1.147, Revision 16. Discuss why Code Case N-638-4 was not used as the applicable code case in Request RR-PZR-01.

CCNPP Response RAI 3:

Regulatory Guide 1.147, Revision 16 was published in October, 2010 and that was after the Design Specification had been issued.

RAI Question 4:

Section 4, page 4, discusses the five steps of sleeve modification. Step 2 states that "... Liquid penetrant (PT) examination of the machined area that is to be welded..." This inspection is needed to ensure that prior to modification, no flaws exist in the lower head penetration bore as a result of machining or existing degradation. Any flaws occurring on the bore surface of the lower head need to be repaired before installing the new sleeve. Discuss whether the entire machined area in the bore will be inspected with PT. If not, justify how the bore is demonstrated to be free of defects prior to sleeve installation.

CCNPP Response RAI 4:

The PT examination will be performed on the area to be welded and will include all new machined surfaces in the bore. The PT examination to be performed after welding is completed will extend across the weld face and extend 1/2" above the weld on the bore and 1/2" below the weld on the sleeves inside diameter. These exam areas are sufficient to assure suitability for welding and that flaw propagation into the weld will not occur.

Also, subsequent to original sleeve removal, a visual inspection will be performed to verify no damage has occurred in the bore.

RAI Question 5:

Section 4, page 4, Step 3 states that "...Welding the replacement stainless steel lower sleeve/nozzle to the pressurizer bottom head using stainless steel weld material. (Refer to Figure 2)..."

(1) Confirm that the welding in Step 3 refers to the weld joining the new sleeve to the bore and is located inside the bore, not the outside surface of the pressurizer bottom head.
(2) Specify the axial length of the inside weld per the design specification and identify the length in Figure 2.
(3) Discuss the verification procedure to ensure that the actual weld axial length satisfies the designed length.

CCNPP Response RAI 5:

(1) The sleeve to bore weld is entirely inside the bore.

(2) The Design Specification does not specify the axial length of the weld. The specific configuration is determined by the design organization and verified by stress analysis. The interface length of the weld in the bore is specified on the installation drawing and is approximately 13/16".

(3) The new lower sleeve is positioned with respect to the upper weld prep bevel and is independently verified by the quality control inspector.

RAI Question 6:

Section 4, page 4, Step 4 states that "...Machining the weld inner surface and adjacent area to provide a surface suitable for nondestructive examination (NDE)..." (1) Specify the exact axial length of the adjacent area that will be machined in Figure 2, and (2) Describe in detail the machining procedure, e.g., what is the thickness that will be removed, what is the quality control procedure, what is the surface finish requirement, and will there be any cold work imposed on the weld?

CCNPP Response RAI 6:

(1) The heater sleeve final machined length will extend from approximately 1" below the weld, across the weld face to approximately 3/4" above the weld.

(2) Approximately 1/32" thickness will be removed from the low alloy steel bore, approximately 1/8" thickness will be removed from the weld, and approximately 1/32" thickness will be removed from the lower heater sleeve during final machining after welding. The surface finish will be suitable for NDE. There will be some cold work induced due to the machining process but the level of cold work will be far below 20%. NUREG-0800 limits the yield strength of cold worked austenitic stainless steel to 90 ksi (kilo-pounds per square inch) (~20% CW) based upon concerns about susceptibility to stress corrosion cracking of higher strength materials. The machining is performed in accordance with an established procedure. Typical surface finishes are expected to be 125 RHR (roughness height reading) or better based on mockup results.

RAI Question 7:

Section 4, page 4, Step 5 states that "...PT and ultrasonic (UT) examination of the weld and adjacent area (Refer to Figure 2)..." Section 5.2, page 6, third paragraph, states that "...The PT area includes the new weld surface and the 1/2 inch minimum distance above and below the weld..." Provide the axial length of the heat affected zone and significant residual stress region in the new sleeve and the ferritic steel of the lower head to demonstrate that 0.5 inch is sufficient.

CCNPP Response RAI 7:

The heat affected zone depth is approximately 3/32" so it will extend beyond the weld face approximately 3/32" on both the top and bottom edges of the weld.

The residual tensile stresses are, as expected, most significant in the new weld with stresses ranging as high as 50 ksi to 65 ksi. However, both the axial and hoop residual stresses decay to approximately 10 ksi or less approximately 1/2" above the top of the weld in the low alloy steel bore and approximately 1/2" below the bottom of the weld in the new heater sleeve and the low alloy steel bore.

RAI Question 8:

Section 4. The final sleeve configuration after modification is not clearly depicted in Figure 2. It is not clear in Figure 2 whether there is a gap between the bottom of the old sleeve and the top of the new sleeve inside the bore even though Figure 3 seems to suggest that there is a gap. Also, it appears that there is no weldment at the junction of the bottom of the new sleeve and the outside surface of the pressurizer head shell. Submit a new figure or modify Figure 2 to document the final configuration after modification. The figure for the final sleeve configuration should include the following information: (1) the heating element joining the new sleeve, (2) the axial length of the gap between the old and new sleeve, (3) whether a weld exists at the junction of the outside surface of the pressurizer and the new sleeve, (4) the original J-groove weld with respect to the original sleeve, (5) the system pressure boundary weld, and (6) relevant dimensions (e.g., weld length).

CCNPP Response RAI 8:

See Sketch No. 1 below.

(1) The configuration is shown in Sketch No. 1 below.

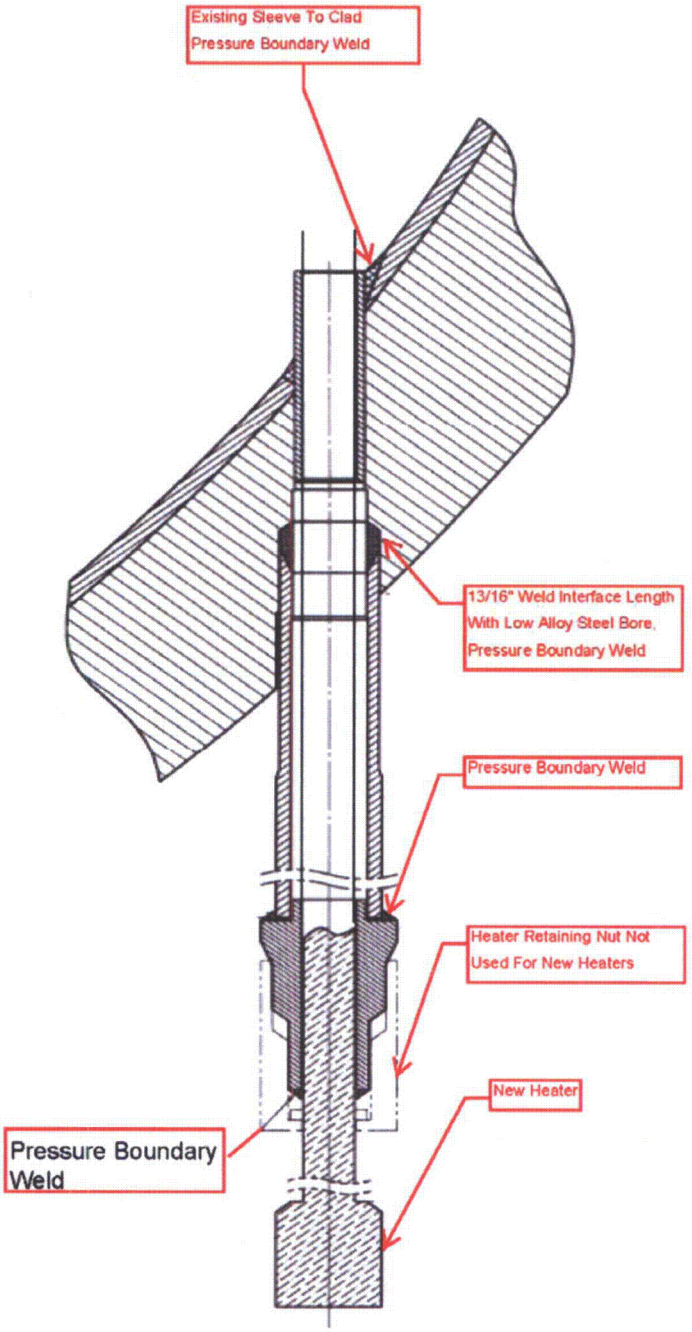
(2) The inside diameter of the new weld and bottom sleeve is greater than the outside diameter of the remaining portion of the original sleeve. The axial distance between the bottom end of the original heater sleeve and the top of the weld is approximately 1". The heater sleeve penetration counter bore diameter is approximately 1.75" and extends up to the high hillside intersection of the bore and outer surface of the bottom head. The final bore diameter is approximately 1.67" and extends upward into the bottom head approximately 3" at the penetration at the periphery of the heater sleeve penetration pattern. The sketch in the relief request is not to scale.

(3) There is no weld between the sleeve/lower instrument nozzle and the outer surface of the pressurizer bottom head.

(4) See Sketch No. 1 below.

(5) See Sketch No. 1 below.

(6) See Sketch No. 1 below.



Sketch No. 1, Final Heater Sleeve Configuration

RAI Question 9:

Section 4. Figure 1 shows various bore diameters after machining without explanation: (1) Explain why there are two different machined diameters in the bore and show their diametrical and axial dimensions; and (2) Include the location of the original J-groove weld in Figure 1.

CCNPP Response RAI 9:

(1) The lower counter bore diameter is needed to facilitate subsequent location and machining of the new bore with the tight clearance fit between the outer diameter of the sleeve and the bore diameter. Also, the bore and sleeve positioning and alignment are important to assure subsequent installation of the heater through the sleeve and into the support plates within the vessel.

(2) The original J-groove sleeve to pressurizer bottom head weld is located on the inner surface of the bottom head. See Sketch No. 1 above and Sketch No. 2 below. The axial distance between the bottom end of the original heater sleeve and the top of the weld is approximately 1". The heater sleeve penetration counter bore diameter is approximately 1.75" and extends up to the high hillside intersection of the bore and the outer surface of the bottom head. The final bore diameter is approximately 1.67" and extends upward into the bottom head approximately 3" at the penetration at the periphery of the heater sleeve penetration pattern.

RAI Question 10:

Provide a diagram/figure that shows the existing configuration of the sleeve, heating element, and weld(s) with respect to the pressurizer lower head before modification.

CCNPP Response RAI 10:

See Sketch No. 2 below.

RAI Question 11:

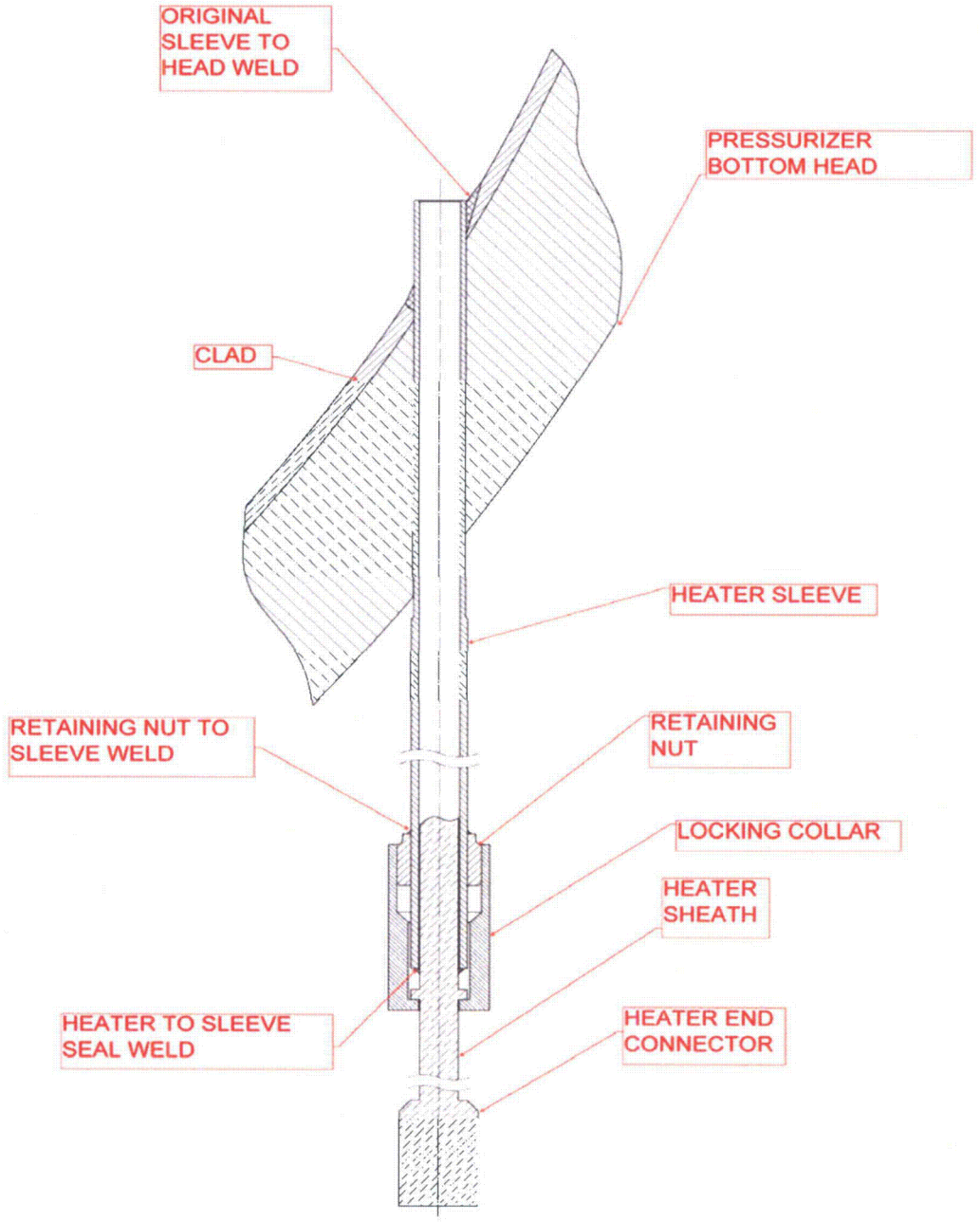
Section 4. (1) Discuss whether the new sleeve will be roll-expanded when it is inserted into the bore before welding. If not, discuss how the sleeve can be held in place before welding and how the crevice between the new sleeve and the bore can be minimized to prevent the potential crevice corrosion; and (2) In the lower part of Figure 2, explain why an empty space/annulus region exists between the new sleeve outer wall and the bore.

CCNPP Response RAI 11:

(1) Roll expansion is not performed. The heater sleeve is held in place using a positioning tool.

The radial clearance and crevice between the replacement outer sleeve outer surface and the bore is not exposed to reactor coolant so crevice corrosion is not a concern.

(2) As described in Response 9.(1) above, the counter bore is initially machined to facilitate machining the bore that interfaces with the replacement sleeve.



Sketch No. 2, Existing Configuration

RAI Question 12:

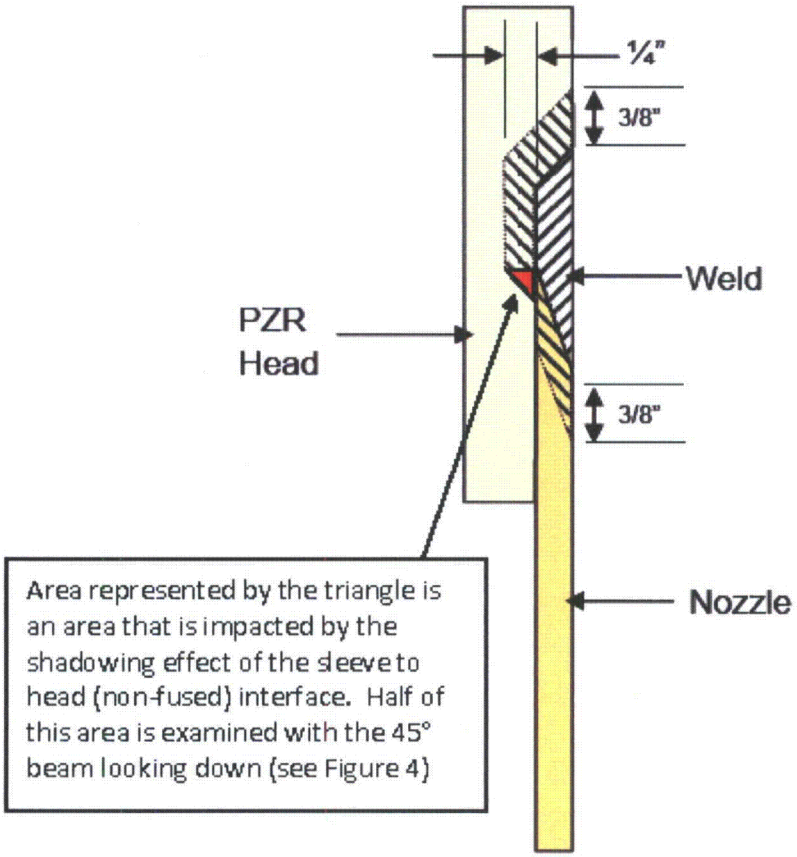
Section 5.2, page 6, mid-page, states that "…The UT is qualified to detect flaws in the new weld and base metal interface beneath the new weld… The volume of interest for UT includes the new weld, the bottom head low alloy steel base material heat affected zone, and the sleeve/nozzle to weld interface and will be covered to the maximum extent practical…" (1) Discuss to which ASME [American Society of Mechanical Engineers] Code Section and subarticles is the UT qualified, and (2) Section 5.3, page 7, 6th paragraph states that the weld configuration precludes examination of a small portion of the ferritic steel

heat affected zone that is shadowed by the interface of the OD of the nozzle. Provide the specific examination coverage (percentage of the required examination volume) of the small portion of the ferritic steel heat affected zone that cannot be examined. Provide the examination coverage of the heat affected zone that can be examined.

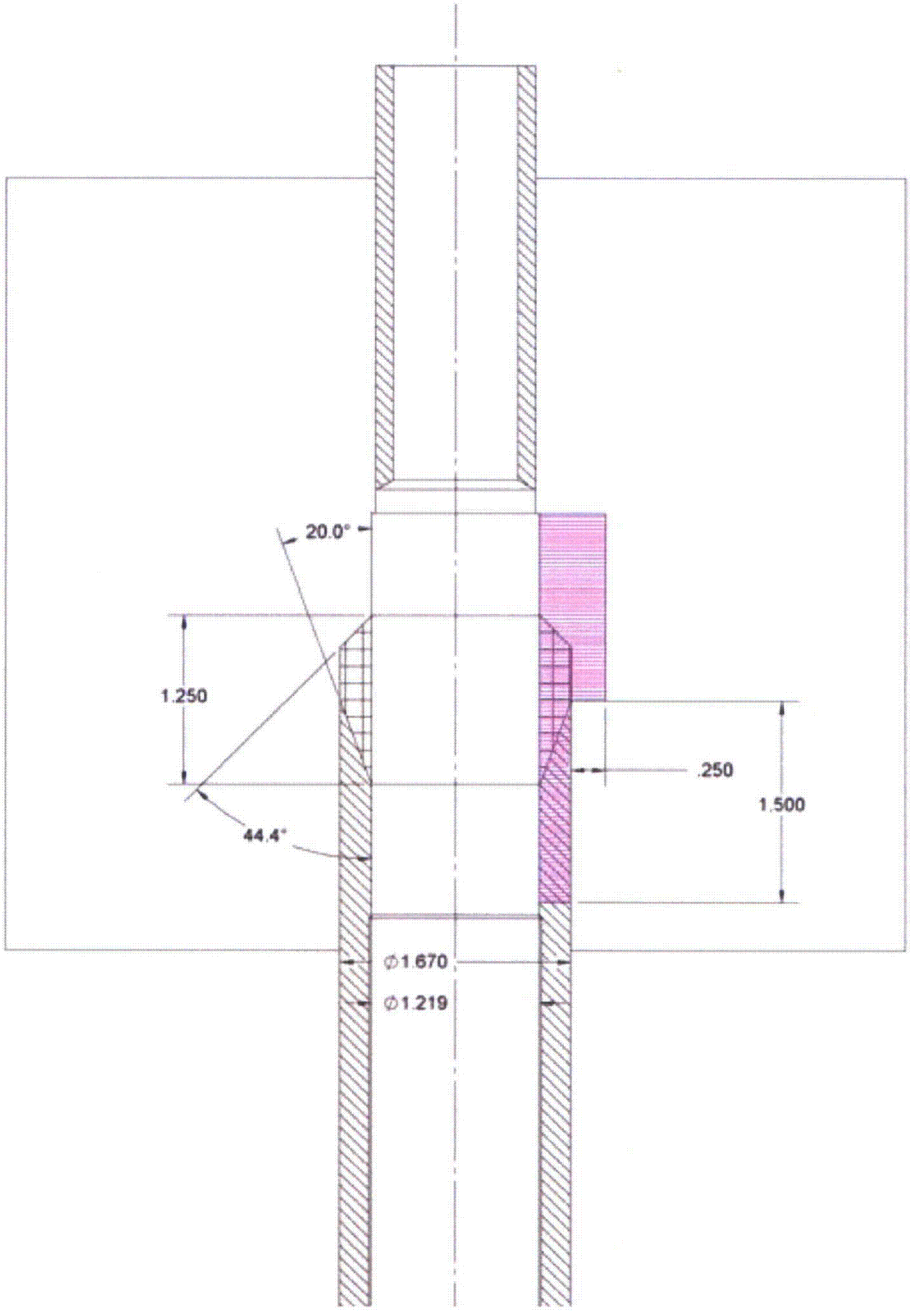
CCNPP Response RAI 12:

(1) Code Case N-638-1 requires that a volumetric examination be conducted in accordance with Section XI, Appendix I. Appendix I, I-2400 directs the ultrasonic examination to be performed in accordance with ASME Section V, Article 4 as supplemented by Table I-2000-1. The examination procedure meets these requirements.

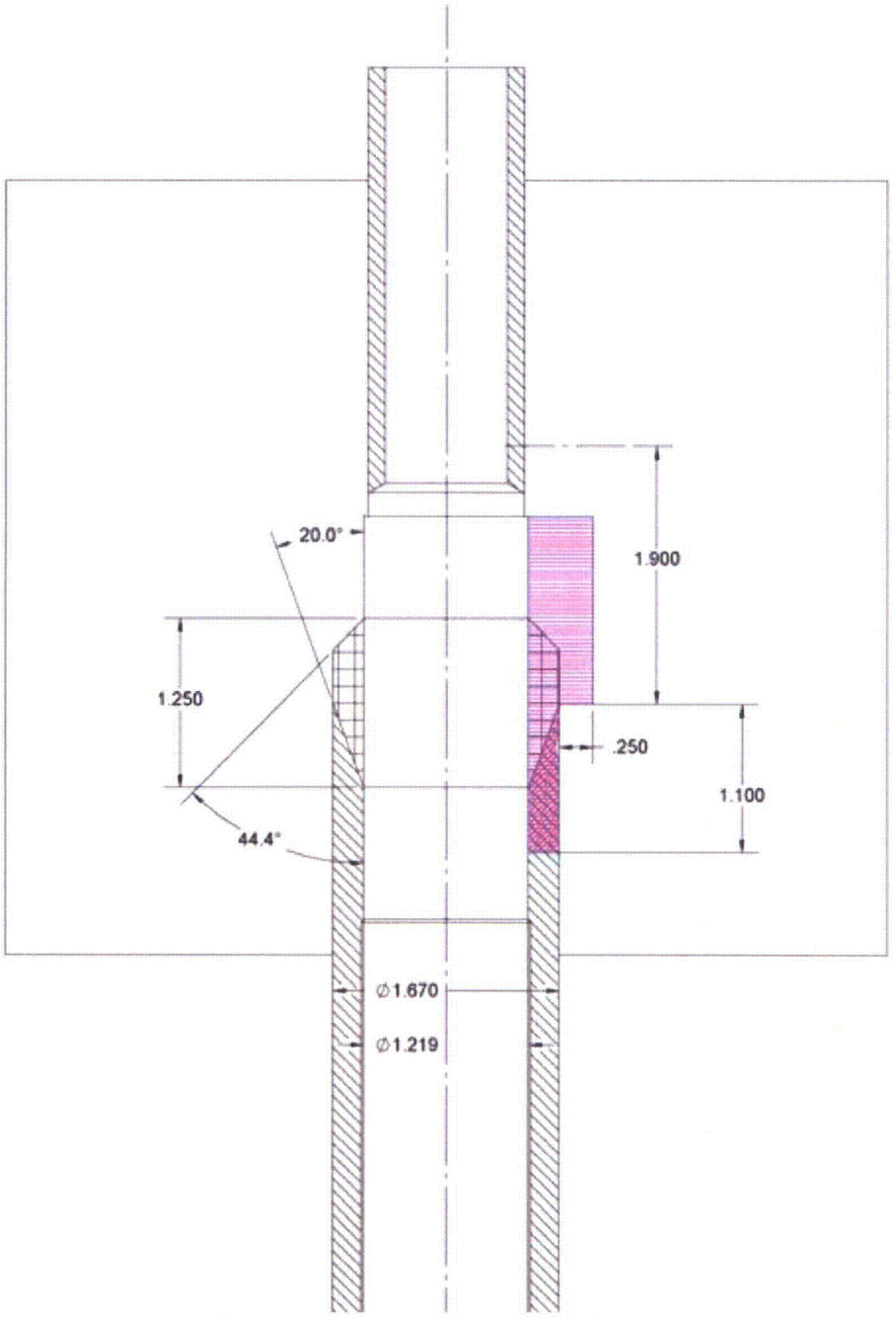
(2) Although the heat affected zone is estimated to be approximately 3/32" deep, the examination procedure conservatively establishes the examination volume to include the weld and adjacent base metal areas identified in Sketch No. 3 below. Sketch No. 5 below also identifies the area affected by the shadowing effect of the non-fused sleeve interface. This area is partially covered by the 45° beam looking downward. The resulting area that cannot be examined by any of the examination angles is estimated to be less than 5% of the total examination volume. The examination coverage provided by each of the UT transducers is provided in Sketch Nos. 4 through 8 below and, as shown, adequately cover the specified examination zone.



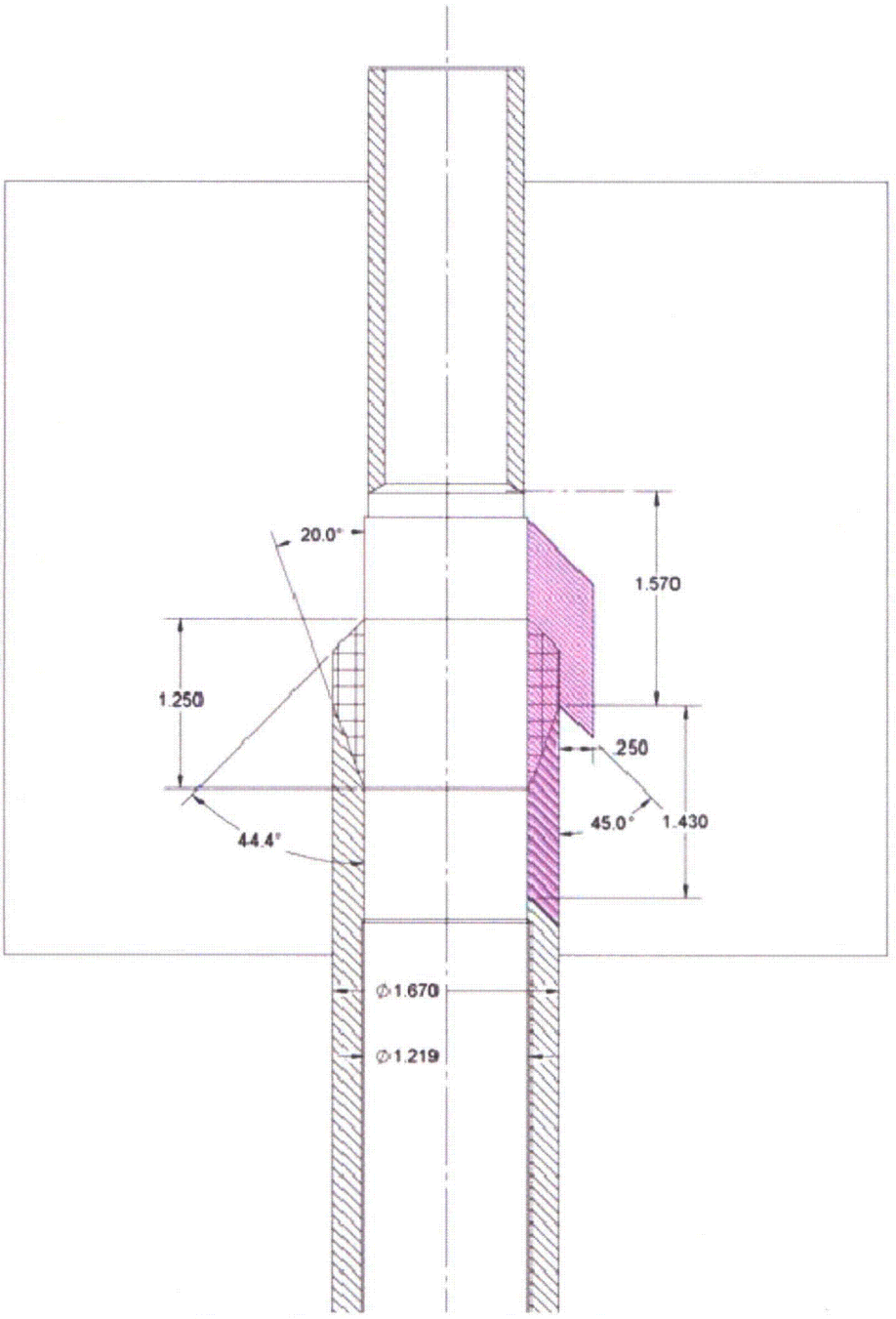
Sketch No. 3, Examination Volume



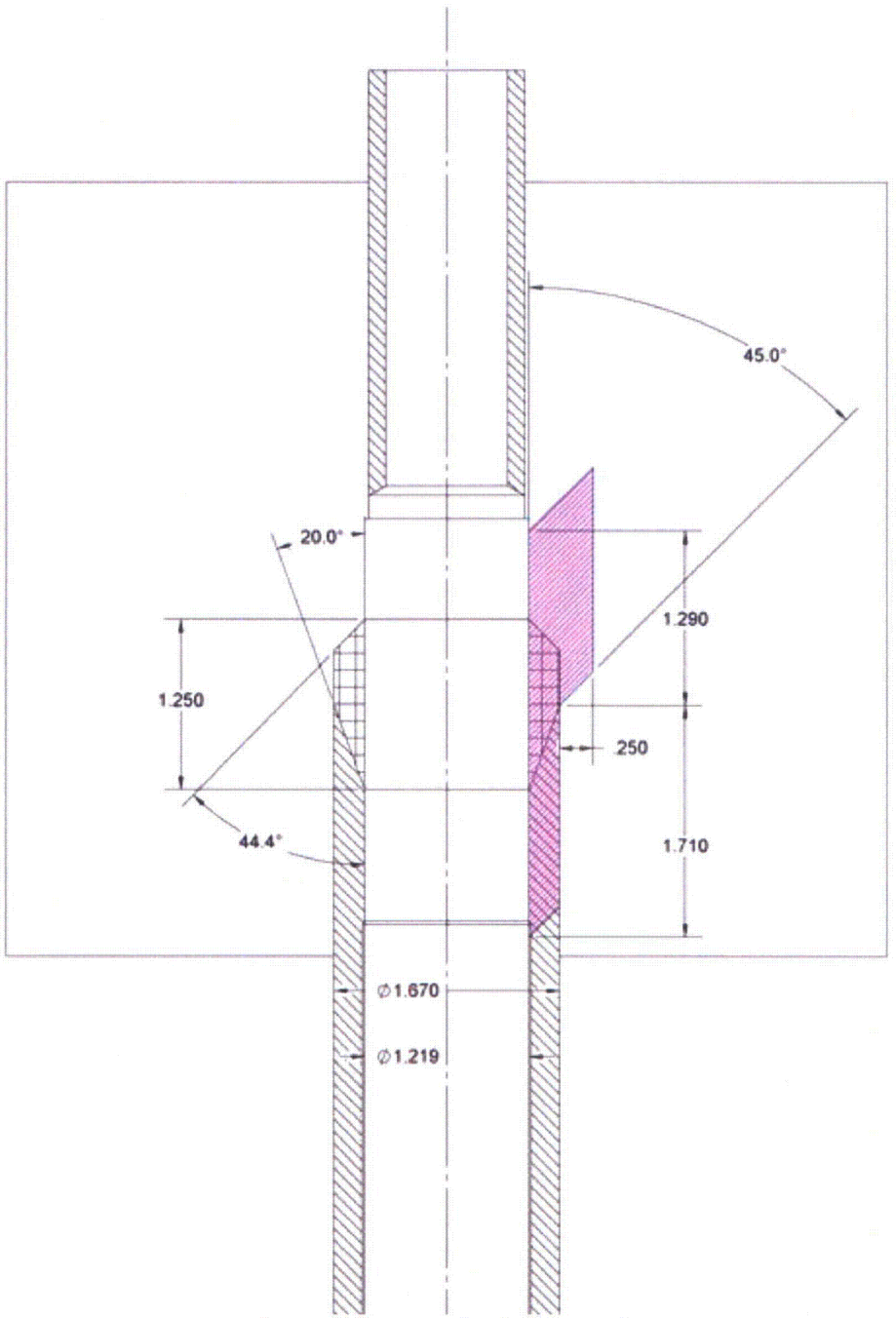
Sketch No. 4, 0° Coverage



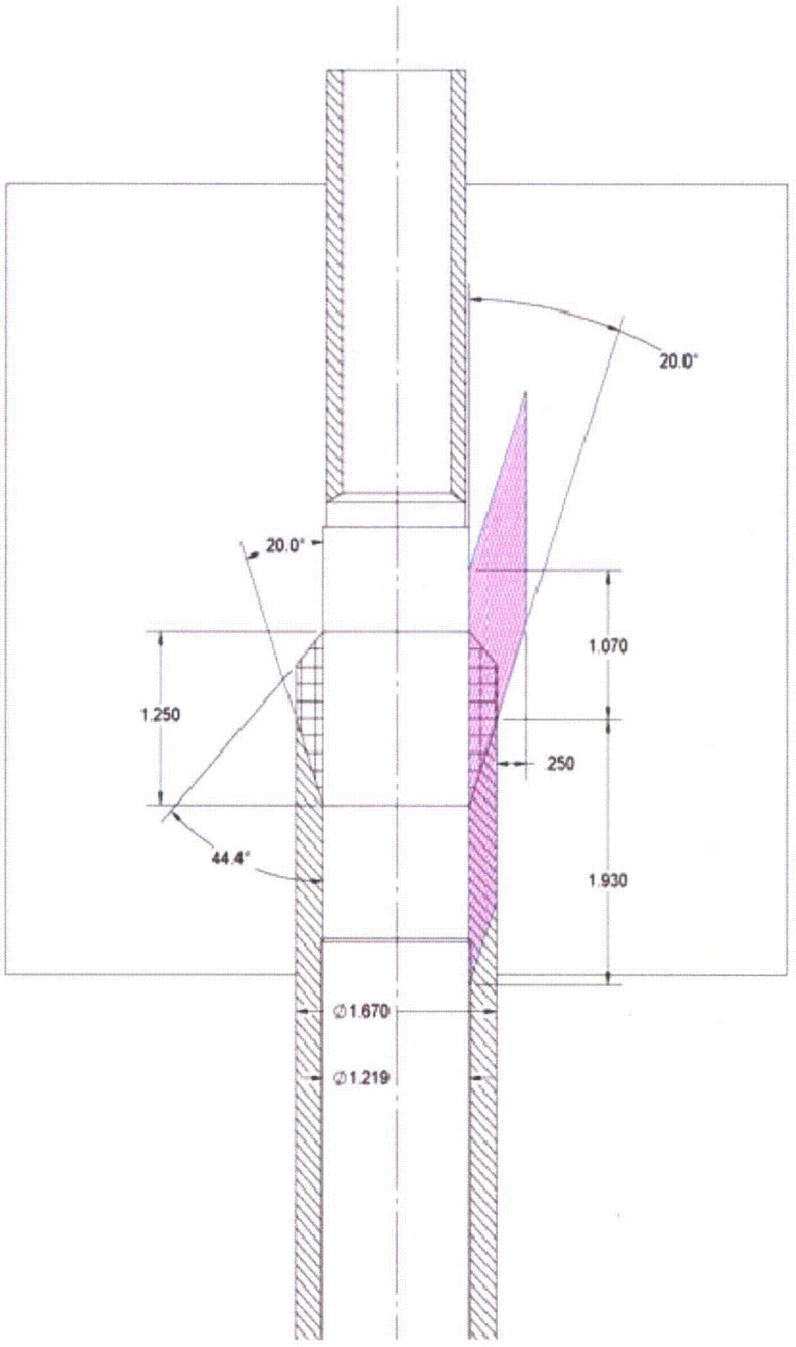
Sketch No. 5, 45°L Circ. Beam Coverage



Sketch No. 6, 45°L Down Beam Coverage



Sketch No. 7, 45°L Up Beam Coverage



Sketch No. 8, 70°L Up Beam Coverage

RAI Question 13:

Section 5.3, page 7, sixth paragraph states that "…The UT transducers and delivery tooling are capable of scanning from the bore of the nozzles with inside diameters near 1.20 inches…" Clarify this sentence. The staff understands that the UT can be performed from the inside the bore but it is not clear what is meant by "near 1.20 inches."

CCNPP Response RAI 13:

The nominal inner diameter of the sleeve and weld after final machining is approximately 1.23" and that is near 1.20".

RAI Question 14:

Section 5.4, page 8, first paragraph stated that "... Mock-up testing has verified that the anomalies may exist and do not exceed 0.05 inches in length..." (1) Discuss the smallest size of indications that the UT is qualified to detect and size; (2) Describe how mock-up testing concludes that the anomaly does not exceed 0.05 inches in length; and (3) If after sleeve installation the UT detects a triple point anomaly that exceeds 0.05 inches, the proposed fracture mechanics calculation assuming a flaw size of 0.05 inches may be invalid. The relief request may also be invalid. Discuss corrective actions if the UT detects a triple point anomaly that exceeds 0.05 inches.

CCNPP Response RAI 14:

(1) The ultrasonic examination technique uses an immersion probe from the nozzle bore containing six transducers to generate refracted beam angles of 0°L, 45°L, and 70°L in the weld material. The 45°L beams are generated in four directions; two axial and two circumferential, each looking in opposing directions. The 70°L beam is only applied in one axial direction looking up. The transducer frequency is 7.5 MHz and results in a short wavelength beam capable of detecting small flaws with high resolution. The selection of the beam angles is based on detecting and characterizing the most probable welding manufacturing flaws likely to exist with this welding process.

Data acquisition and analysis is performed using UltraVision software. Scanning is performed using an automated scanner to move the probe in a raster pattern to examine the area of interest that includes the weld and heat affected zones. Scans are performed in the circumferential direction while indexing in the axial direction. The index increment is 0.015" and the sample interval in the circumferential direction is 1.04° (0.011") to provide high resolution of the examination area.

The angle beam transducers are calibrated on nominal 0.021" (10%) deep inner diameter and outer diameter notches. The straight beam transducer is calibrated on 0.050" diameter flat bottom holes distributed throughout the weld volume and adjacent base metal. These responses establish the primary reference level [100% DAC (distance amplitude correction)]. Indications providing responses of greater than 20% DAC are evaluated for acceptance. Representative mockups have been fabricated and notches as small as 0.025" located at the triple point have been demonstrated to be detected and characterized.

(2) Mock-up coupons were routinely cross-sectioned and metallographically examined in the areas of the weld identified by UT as the location of maximum signal amplitude. The triple point anomalies were thus measured at these locations and then correlated to the UT data. Sufficient quantities of mock-ups were metallographically examined to statistically verify the accuracy of the UT data prior to process qualification. During process qualification, there were no triple point anomalies found to be greater than 0.05" by either metallographic examination or UT.

(3) The weld in the case cited would be removed and replaced.

RAI Question 15:

Discuss whether a full scale mock-up was or will be prepared to qualify the sleeve modification procedures, including machining, welding, and inspections. If yes, describe the qualification of modification procedures. If not, discuss how the sleeve modification can be ensured to achieve acceptable results.

CCNPP Response RAI 15:

A full scale mock-up was prepared and used to demonstrate all activities associated with the repair. The entire process from start to finish was demonstrated using this mock-up as it would be implemented in the field. The process included all machining, welding, and non-destructive examinations utilizing all equipment and tooling that will be used to implement the repair. The engineering drawings and modification procedures were used as the basis to control the work to ensure acceptable results were demonstrated and achieved. The repair process was demonstrated in all of the various sleeve locations. The modification process was validated on ten coupons.

RAI Question 16:

Section 5.4, page 8, seventh paragraph states that "...Based on evaluation procedures and acceptance criteria contained in Article IWB-3612 and Appendix C of ASME Section XI, results of fracture mechanics analyses demonstrate that a 0.05 inch weld anomaly in either a repaired heater sleeve or instrumentation nozzle is acceptable for a 40-year design life..." Submit the flaw evaluation for the triple point anomaly.

CCNPP Response RAI 16:

Attachments (2) and (3) contain the flaw evaluations for the pressurizer heater sleeve weld anomaly and the instrument nozzle weld anomaly analyses respectively. Since these documents are proprietary, an affidavit declaring that the analyses contain information that is considered proprietary by AREVA is contained in Attachment (6).

RAI Question 17:

Section 5.5, page 9. Submit the flaw evaluation of the J-groove weld between the original sleeve and pressurizer lower head nozzle penetration.

CCNPP Response RAI 17:

Attachments (4) and (5) contain the flaw evaluations for the pressurizer heater sleeve J-groove weld and instrument nozzle J-groove weld analyses respectively. Since these documents are proprietary, an affidavit declaring that the analyses contain information that is considered proprietary by AREVA is contained in Attachment (6).

RAI Question 18:

Discuss the inservice inspection of the new sleeve and new weld, including the frequency and method.

CCNPP Response RAI 18:

The inservice inspection requirements for the new heater sleeves and welds will consist of performing a Class 1 pressure test each refueling outage. This inspection will be conducted in conjunction with the

existing pressure test of reactor coolant system pressure boundaries. This pressure test is performed while the unit is in Mode 3 with the unit at normal operating temperature and pressure.

RAI Question 19:

Discuss the design qualification of the proposed repair or submit the design calculations and specifications. Specifically, discuss how the new sleeve and the new weld satisfy the design requirements of the ASME Code, Section III. This discussion should explain how the new sleeve and weld support the loading so that the new sleeve and the associated heater element will not be ejected from the pressurizer penetration.

CCNPP Response RAI 19:

The configuration complies with Figure NB-4244(d)-2(d). Furthermore, it is demonstrated that the repair configuration is qualified for the applicable ASME Section III, NB-3200 (P, P+Q and fatigue). For the ASME qualification, a detailed 3D Finite Element models consists of a segment of the pressurizer bottom head and its cladding, remnant of the original nozzle and its weld and finally, replacement nozzle and its connection to the head. Thermal and pressure transients will be applied to the models. Thermal analyses are performed to calculate the thermal distributions at key locations in the models for each transient event. Following an assessment of the results of the thermal analyses, elastic structural analyses are performed. The analyses mentioned above demonstrate that the new sleeve and heater will not be ejected.

ATTACHMENT (6)

AREVA AFFIDAVIT FOR PROPRIETARY INFORMATION

AFFIDAVIT

COMMONWEALTH OF VIRGINIA)
) ss.
CITY OF LYNCHBURG)

1. My name is Gayle F. Elliott. I am Manager, Product Licensing, for AREVA NP Inc. (AREVA NP) and as such I am authorized to execute this Affidavit.

2. I am familiar with the criteria applied by AREVA NP to determine whether certain AREVA NP information is proprietary. I am familiar with the policies established by AREVA NP to ensure the proper application of these criteria.

3. I am familiar with the AREVA NP information contained in Calculation Summary Sheets (CSS) 32-9116472-003, entitled "CCNPP-1 PZR Instrument Nozzle As-Left J-Groove Weld Flaw Evaluation for IDTB Repair," dated March 2011, 32-9116473-003, entitled "CCNPP-1 PZR Instrument Nozzle Weld Anomaly Analysis," dated March 2011, 32-9116467-003, entitled "CCNPP-1 PZR Heater Sleeve As-Left J-Groove Weld Flaw Evaluation for IDTB Repair," dated March 2011, 32-9116468-003, entitled "CCNPP-1 PZR Heater Sleeve and Plug Weld Anomaly Analysis," dated March 2011 and referred to herein as "Documents." Information contained in these Documents has been classified by AREVA NP as proprietary in accordance with the policies established by AREVA NP for the control and protection of proprietary and confidential information.

4. These Documents contain information of a proprietary and confidential nature and are of the type customarily held in confidence by AREVA NP and not made available to the public. Based on my experience, I am aware that other companies regard information of the kind contained in these Documents as proprietary and confidential.

5. These Documents have been made available to the U.S. Nuclear Regulatory Commission in confidence with the request that the information contained in these Documents be withheld from public disclosure. The request for withholding of proprietary information is made in accordance with 10 CFR 2.390. The information for which withholding from disclosure is requested qualifies under 10 CFR 2.390(a)(4) "Trade secrets and commercial or financial information."

6. The following criteria are customarily applied by AREVA NP to determine whether information should be classified as proprietary:

(a) The information reveals details of AREVA NP's research and development plans and programs or their results.

(b) Use of the information by a competitor would permit the competitor to significantly reduce its expenditures, in time or resources, to design, produce, or market a similar product or service.

(c) The information includes test data or analytical techniques concerning a process, methodology, or component, the application of which results in a competitive advantage for AREVA NP.

(d) The information reveals certain distinguishing aspects of a process, methodology, or component, the exclusive use of which provides a competitive advantage for AREVA NP in product optimization or marketability.

(e) The information is vital to a competitive advantage held by AREVA NP, would be helpful to competitors to AREVA NP, and would likely cause substantial harm to the competitive position of AREVA NP.

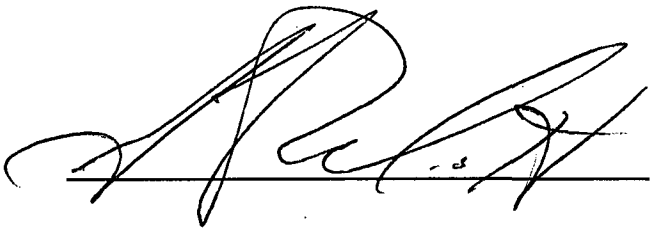
The information in these Documents is considered proprietary for the reasons set forth in paragraphs 6(b) and 6(c) above.

7. In accordance with AREVA NP's policies governing the protection and control of information, proprietary information contained in these Documents have been made

available, on a limited basis, to others outside AREVA NP only as required and under suitable agreement providing for nondisclosure and limited use of the information.

8. AREVA NP policy requires that proprietary information be kept in a secured file or area and distributed on a need-to-know basis.

9. The foregoing statements are true and correct to the best of my knowledge, information, and belief.



SUBSCRIBED before me this 20th
day of April, 2011.

Sherry L. McFaden
NOTARY PUBLIC, COMMONWEALTH OF VIRGINIA
MY COMMISSION EXPIRES: 10/31/14
Reg. # 7079129

SHERRY L. MCFADEN
Notary Public
Commonwealth of Virginia
7079129
My Commission Expires Oct 31, 2014