Progress Energy

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Serial: HNP-08-045
10 CFR 50.55a

U.S. Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
SECOND TEN-YEAR INTERVAL INSERVICE INSPECTION PROGRAM - FINAL DOCUMENTATION INCLUDING REQUESTS FOR RELIEF IN ACCORDANCE WITH 10 CFR 50.55a

Ladies and Gentlemen:

In accordance with the Code of Federal Regulations, Title 10, Part 50.55a, "Codes and Standards," Carolina Power and Light Company (CP&L) doing business as Progress Energy Carolinas, Inc. (PEC), submits the following relief requests for the Second Ten-Year Inservice Inspection (ISI) Interval for the Harris Nuclear Plant (HNP). These Relief Requests are applicable to HNP's Second Ten-Year Inservice Inspection Interval, in effect from February 2, 1998, through and including May 1, 2008.

Enclosures 1 through 8 are Relief Requests 2R1-018, 2R1-019, 2R1-020, 2R1-021, 2R1-022, 2R2-009, 2R2-010 and 2R2-011, respectively. Relief is requested in accordance with 10 CFR 50.55a(g)(5)(iii) from the applicable section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components."

HNP requests approval of these requests by May 01, 2009. Please note that the attached relief requests were all previously approved for HNP's First Ten-Year ISI Interval with the exception of RVNOZCI-N-05SE and RVNOZBI-N-03SE, as discussed in 2R1-018 (Enclosure 1).

Enclosures 9 and 10 contain additional inspection information relative to the close-out of this Second Ten-Year Interval for HNP.

This document contains no new regulatory commitments.

Please refer any question regarding this submittal to me at (919) 362-3137.

Sincerely,

D. H. Corlett
Supervisor – Licensing/Regulatory Programs
Harris Nuclear Plant

Progress Energy Carolinas, Inc.
Harris Nuclear Plant
P. O. Box 165
New Hill, NC 27562

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Enclosures:
1. Relief Request 2R1-018
2. Relief Request 2R1-019
3. Relief Request 2R1-020
4. Relief Request 2R1-021
5. Relief Request 2R1-022
6. Relief Request 2R2-009
7. Relief Request 2R2-010
8. Relief Request 2R2-011
9. Additional Information – Code Case N-481
10. Additional Information – RFO13

cc: Mr. J. D. Austin, NRC Senior Resident Inspector, HNP
Mr. Larry Jones, Harris Plant Authorized Nuclear Inservice Inspector
Mr. L. A. Reyes, NRC Regional Administrator, Region II
Ms. M. G. Vaaler, NRC Project Manager for HNP

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
10 CFR 50.55a RELIEF REQUEST: 2R1-018

Request for Relief for Limited Coverage for Welds in Examination Category B-F in Accordance with 10CFR50.55a(g)(5)(iii)
--Inservice Inspection Impracticality--

1.0 ASME CODE COMPONENTS AFFECTED

(a) Description:

Limited coverage for three Pressure Retaining Piping Welds in Examination Category B-F
Item Number: B5.130, "NPS 4 or Larger Dissimilar Metal Butt Welds"

(b) Function:

Pressure Retaining Dissimilar Metal (DM) Welds

(c) Class:

ASME Code Class 1

(d) Component Numbers:

RVNOZCI-N-05SE	Inlet Nozzle DM weld @ 95 deg.
RVNOZBI-N-03SE	Inlet Nozzle DM weld @ 215 deg.
RVNOZAI-N-01SE	Inlet Nozzle DM weld @ 335 deg.

(e) Previous 10-Year Interval Approval:

Relief Request R1-011 (SERIAL: HNP-97-217), submitted December 16, 1997, for Harris Nuclear Plant (HNP's) First 10-Year Inservice Inspection Interval. NRC approval letter (TAC NO. MA0433) and associated Safety Evaluation dated September 11, 1998, for Relief Request R1-011.

2.0 APPLICABLE CODE EDITION AND ADDENDA

American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, 1989 Edition with no Addenda.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
10 CFR 50.55a RELIEF REQUEST: 2R1-018

3.0 APPLICABLE CODE REQUIREMENT

ASME Section XI, IWB-2500, "Examination and Pressure Test Requirements," specifies: "(a) Components shall be examined and tested as specified in Table IWB-2500-1. The method of examination for the components and parts of the pressure retaining boundaries shall comply with those tabulated in Table IWB-2500-1...."

Table IWB-2500-1, "Examination Categories," Examination Category B-F (Pressure Retaining Dissimilar Metal Welds), requires that all welds (Notes 2, 3) in Item No. B5.130, Reactor Vessel NPS 4 or Larger Dissimilar Metal Butt Welds, meet the volumetric and surface examination requirements of Fig. No. IWB-2500-8.

In accordance with Note 2, the examinations may be performed coincident with the vessel nozzle examination required by Examination Category B-D for the reactor vessel nozzle safe ends. Per Note 3, included are dissimilar metal welds between combinations of: (a) carbon or low alloy steels to high alloy steels (b) carbon or low alloy steels to high nickel alloys (c) high alloy steels to high nickel alloys. Therefore, welds RVNOZCI-N-05SE, RVNOZBI-N-03SE, and RVNOZAI-N-01SE, all reactor vessel inlet nozzle DM welds, must meet these examination criteria.

HNP has adopted ASME Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 Welds," which is applicable when the entire examination volume or area cannot be examined due to interference by another component or part geometry. Under such circumstances, a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted provided that the reduction in coverage for that weld is less than 10 percent.

4.0 IMPRACTICALITY OF COMPLIANCE

In accordance with the guidelines of 10 CFR 50.55a(g)(5)(iii), relief is requested since the subject pressure retaining dissimilar metal welds would have to be redesigned and modified for HNP to achieve 100 percent volumetric coverage. The specific welds are inaccessible for inspection due to physical obstructions and geometric surface conditions, restricting complete examination coverage and resulting in the impracticality of performing 100 percent volumetric examination on these welds. Design modifications to the Reactor Pressure Vessel (RPV) would be required to gain access for such examination.

This design restriction makes compliance with the ASME XI, IWB-2500, Code required examination coverage requirements impractical. To meet these ASME Code requirements, reactor vessel modifications or the replacement of components would be needed.

5.0 BURDEN CAUSED BY COMPLIANCE

The HNP reactor vessel is a typical 3-loop Westinghouse Pressurized Water Reactor design. The Code requires 100 percent volumetric examination of all inlet nozzle dissimilar metal reactor vessel welds. However, volumetric examination for the subject welds at HNP is restricted due to geometric surfaces (inner diameter surface counter-bore and root configuration) which limit accessibility and make the 100 percent volumetric examination impractical for these areas.

To gain additional coverage, the RPV nozzles would require design modifications. However, this type of change would be difficult due to the cramped operating space and the personnel exposure to residual radiation common in operating nuclear power plants. Based on the location inaccessibility and the potential for radiation exposure, meeting this 100 percent volumetric inspection requirement would be an undue burden for HNP.

6.0 PROPOSED ALTERNATIVE AND BASIS FOR USE

HNP is proposing to volumetrically examine the pressure retaining welds RVNOZCI-N-05SE, RVNOZBI-N-03SE and RVNOZAI-N-01SE to the maximum extent possible using Ultrasonic (UT) Examination in accordance with the Inservice Inspection Program schedule. A significant portion of the subject welds were examined, obtaining 84 percent to 88 percent coverage for each cold leg elbow to nozzle weld as required by the Code.

To supplement the UT, areas of limitation were fully scanned using eddy current testing (ET), which is effective in detecting surface breaking flaws. This combination of UT and ET further validates that the proposed alternative provides an acceptable level of quality and safety, since these completed examinations would have detected any existing patterns of degradation.

6.1 Elbow to Nozzle (Inlet Nozzle DM weld @ 95 degrees) RVNOZCI-N-05SE

a) UT examinations performed with examination personnel and examination procedures qualified to ASME Code, Appendix VIII, as administered by the EPRI Performance Demonstration Initiative (PDI), achieved 100 percent coverage of the DM weld in the axial direction and 69.15 percent of the DM weld in the circumferential direction, resulting in a combined UT coverage total of 84.58 percent.

b) In addition to the UT examination of the inlet nozzle dissimilar metal weld, HNP

performed a supplemental ET examination. This weld is a DM Alloy 82/182 material, which is susceptible to Primary Water Stress Corrosion Cracking (PWSCC). The ET examination of the wetted surface would detect any onset of PWSCC. The results, which showed no indications of such PWSCC onset, provide an equivalent level of assurance to the original requirement that the DM weld does not contain any surface breaking flaws.

c) The normal Visual (VT-2) Examination is performed in conjunction with system leakage testing each refueling outage. This assures that any leakage would be detected prior to gross piping failure.

6.2 <u>Elbow to Nozzle (Inlet Nozzle DM weld @ 215 Degrees RVNOZBI-N-03SE</u>

a) UT examinations performed with examination personnel and examination procedures qualified to ASME Code, Appendix VIII, as administered by the EPRI PDI, achieved 100 percent coverage of the DM weld in the axial direction and 76.67 percent of the DM weld in the circumferential direction, resulting in a combined UT coverage total of 88.34 percent.

b) In addition to the UT examination of the inlet nozzle dissimilar metal weld, HNP performed a supplemental ET examination. This weld is a DM Alloy 82/182 material, which is susceptible to PWSCC. The ET examination of the wetted surface would detect any onset of PWSCC. The results, which showed no indications of such PWSCC onset, provide an equivalent level of assurance to the original requirement that the DM weld does not contain any surface breaking flaws.

c) The normal VT-2 Examination is performed in conjunction with system leakage testing each refueling outage. This assures that any leakage would be detected prior to gross piping failure.

6.3 <u>Elbow to Nozzle (Inlet Nozzle DM weld @ 335 Degrees) RVNOZAI-N-01SE</u>

a) UT examinations performed with examination personnel and examination procedures qualified to ASME Code, Appendix VIII, as administered by the EPRI PDI, achieved 100 percent coverage of the DM weld in the axial direction and 70.29 percent of the DM weld in the circumferential direction, resulting in a combined UT coverage total of 85.15 percent.

b) In addition to the UT examination of the inlet nozzle dissimilar metal weld, HNP performed a supplemental ET examination. This weld is a DM Alloy 82/182 material, which is susceptible to PWSCC. The ET examination of the wetted

surface would detect any onset of PWSCC. The results, which showed no indications of such PWSCC onset, provide an equivalent level of assurance to the original requirement that the DM weld does not contain any surface breaking flaws.

c) The normal VT-2 Examination is performed in conjunction with system leakage testing each refueling outage. This assures that any leakage would be detected prior to gross piping failure.

6.4 Conclusion

HNP requests approval of the presented alternative to ASME Section XI, IWB-2500, Table IWB-2500-1 requirements for welds RVNOZCI-N-05SE, RVNOZBI-N-03SE and RVNOZAI-N-01SE.

As documented in Sections 6.1, 6.2 and 6.3 of this Request, the examinations performed for welds RVNOZCI-N-05SE, RVNOZBI-N-03SE and RVNOZAI-N-01SE during the reactor vessel examination and the associated system leakage testing provide reasonable assurance of the continued structural integrity of the subject RPV welds. To supplement the UT, areas of limitation were fully scanned using ET, which is effective in detecting surface breaking flaws. This combination of UT and ET further validate that the proposed alternative provides an acceptable level of quality and safety.

7.0 DURATION OF PROPOSED ALTERNATIVE

This relief request is applicable to the Second Ten-Year Inservice Inspection Interval for HNP, in effect from February 2, 1998, through and including May 1, 2008.

8.0 PRECEDENT

A similar request for relief, HNP First Inspection Interval Relief Request R1-011B Part 3, was approved on September 11, 1998, for Inlet Nozzle weld RVNOZA1-N-01SE:

NRC Docket No. 50-400
TAC No. MA0433

8.1 Changes in Circumstances

During the first interval, these examinations were performed by a different vendor using different equipment, resulting in different coverage limitations. In addition, the second interval UT Examinations were performed with examination personnel and examination procedures qualified to ASME Code, Appendix VIII, as administered by the EPRI PDI.

The circumstances and basis for the previous NRC approval have not changed from the first 10-year approval to the current second 10-year request. It is noted that during the referenced Relief Request for the First 10-year Inspection Interval, the subject welds were described as "Nozzle to Safe-end" welds. Recent research indicates that although it was plant knowledge that these were not safe-ends, the description was used in accordance with standard industry nomenclature.

The following changes in technology with regard to the inspection or testing have been incorporated:

UT Examinations were performed with examination personnel and examination procedures qualified to ASME Code, Appendix VIII, as administered by the EPRI PDI.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
10 CFR 50.55a RELIEF REQUEST: 2R1-019

Request for Relief for Limited Coverage for Welds in Examination Category B-A in Accordance with 10CFR50.55a(g)(5)(iii)
--Inservice Inspection Impracticality--

1.0 ASME CODE COMPONENTS AFFECTED

(a) Description:

Limited coverage for two Pressure Retaining Welds in Reactor Vessel
Examination Category B-A
Item Number: B1.11, "Circumferential Shell Welds"
Item Number: B1.21, "Circumferential Head Welds"

(b) Function:

Pressure Retaining Welds in Reactor Vessel

(c) Class:

ASME Code Class 1

(d) Component Numbers:

STHW-RV-04	Lower Shell to Lower Circumferential Weld
CHW-RV-17	Lower Head Circumferential Weld

(e) Previous 10-Year Interval Approval:

Relief Request R1-011 (SERIAL: HNP-97-217), submitted December 16, 1997, for Harris Nuclear Plant (HNP's) First 10-Year Inservice Inspection Interval. NRC approval letter (TAC NO. MA0433) and associated Safety Evaluation dated September 11, 1998, for Relief Request R1-011B (Part 1).

2.0 APPLICABLE CODE EDITION AND ADDENDA

American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, 1989 Edition with no Addenda.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
10 CFR 50.55a RELIEF REQUEST: 2R1-019

3.0 APPLICABLE CODE REQUIREMENT

ASME Section XI, IWB-2500, "Examination and Pressure Test Requirements," specifies: "(a) Components shall be examined and tested as specified in Table IWB-2500-1. The method of examination for the components and parts of the pressure retaining boundaries shall comply with those tabulated in Table IWB-2500-1 ...."

Table IWB-2500-1, "Examination Categories," Examination Category B-A (Pressure Retaining Welds in Reactor Vessel), requires that all welds (Note 2) in Item No. B1.11, Circumferential Shell Welds, meet the volumetric examination requirements of Fig. No. IWB-2500-1. Note 2 in this Table identifies that the examination include essentially 100 percent of the weld length. Therefore, weld STHW-RV-04, a Lower Shell to Lower Circumferential Weld, must meet these examination criteria.

Table IWB-2500-1 also requires that the accessible length of all welds (Note 2) in Item No. B1.21, Circumferential Head Welds, meet the volumetric examination requirements of Fig. No. IWB-2500-3. Note 2 identifies that the inspection include essentially 100 percent of the weld length. Therefore, weld CHW-RV-17, a Lower Head Circumferential Weld, must meet these examination criteria.

HNP has adopted ASME Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 Welds," applicable when the entire examination volume or area cannot be examined due to interference by another component or part geometry. Under such circumstances, a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted provided that the reduction in coverage for that weld is less than 10 percent.

4.0 IMPRACTICALITY OF COMPLIANCE

In accordance with the guidelines of 10 CFR 50.55a(g)(5)(iii), relief is requested since the Reactor Pressure Vessel (RPV) would have to be redesigned and modified for HNP to achieve 100 percent volumetric coverage. The specific welds are inaccessible for inspection due to physical obstructions and geometric surface conditions, restricting complete examination coverage and resulting in the impracticality of performing 100 percent volumetric examination on these welds. Design modifications to the RPV would be required to gain access for such examination.

This design restriction makes compliance with the ASME XI, IWB-2500, Code required examination coverage requirements impractical. To meet these ASME Code requirements, reactor vessel modifications or the replacement of components would be needed.

5.0 BURDEN CAUSED BY COMPLIANCE

The HNP reactor vessel is a typical 3-loop Westinghouse Pressurized Water Reactor design. Located within the reactor vessel are obstructions that limit the amount of ultrasonic examination coverage that can be achieved for certain welds. The examination of the reactor vessel for the Second Ten-Year Inservice Inspection Interval, conducted during the period of April 17, 2006 through April 20, 2006, confirmed that the required "essentially 100 percent" examination coverage was not achievable due to physical obstructions and geometric surface conditions that made 100 percent volumetric examination impractical for these welds.

The limitations for Reactor Vessel Lower Head to Lower Shell Circumferential Weld STHW-RV-04 are the four core support lugs integrally attached to the reactor vessel.

The limitations for Reactor Vessel Lower Head Circumferential Weld CHW-RV-17 are the peripherally located Bottom Mounted Instrumentation (BMI) tubes integrally attached to the reactor vessel.

To gain additional coverage, the Reactor Vessel would require design modifications. The type of change needed would be the removal of core support lugs, which is not a possibility, and the relocation of BMI tubes, also not possible. Therefore, it would be an undue burden for HNP to attain the required 100 percent volumetric inspection.

6.0 PROPOSED ALTERNATIVE AND BASIS FOR USE

HNP is proposing to volumetrically examine the RPV pressure retaining welds STHW-RV-04 and CHW-RV-17 to the maximum extent possible using Ultrasonic (UT) Examination in accordance with the Inservice Inspection Program schedule. A significant portion of the subject welds were examined. Coverage amounts of 83.90 percent for weld STHW-RV-04 and 81.77 percent for weld CHW-RV-17 were obtained. In addition, the welds are subject to visual (VT-2) system leakage testing during each refueling outage.

6.1 Reactor Vessel Lower Head to Lower Shell Circumferential Weld (STHW-RV-04)

a) Weld STHW-RV-04 is situated just below the four core support lugs, which are fixed in-place. This circumferential weld was completely scanned between the core lugs and the accessible areas below the lugs. The scan boundaries were maximized by visually assisted positioning of the exam head so that scan starts and stops were as close to the support lugs as tool configuration allowed, which achieved the maximum coverage. UT examinations performed with examination personnel and examination procedures qualified to ASME Code, Appendix VIII,

as administered by the EPRI Performance Demonstration Initiative (PDI), achieved the following examination coverage percentages:

BEAM DIRECTION	45 DUAL		45 SINGLE		45 SHEAR	
	WELD	VOLUME	WELD	VOLUME	WELD	VOLUME
CCW	75.56	84.41	82.04	84.41	82.04	84.41
CW	75.56	84.41	82.04	84.41	82.04	84.41
UP	79.11	79.11	79.11	79.11	100	97.46
DOWN	79.11	79.11	79.11	79.11	100	97.46

The coverage achieved was the maximum extent of coverage practical with the obstructions in place, with results representative of the entire weld. Final examination coverage is calculated at 83.90 percent.

b) The normal VT-2 examination is performed in conjunction with system leakage testing each refueling outage. This assures that any leakage would be detected prior to gross failure.

6.2 Reactor Vessel Lower Head Circumferential Weld (CHW-RV-17)

a) Weld CHW-RV-17 is located at the elevation of the periphery of the lower head penetrations. The weld was scanned in numerous individual segments between and around the penetrations. The scan boundaries were maximized by visually assisted positioning of the exam head so that scan starts and stops were as close to the BMI's as tool configuration allowed, achieving the maximum coverage. UT examinations performed with examination personnel and examination procedures qualified to ASME Code, Appendix VIII, as administered by the EPRI PDI, achieved the following examination coverage percentages:

BEAM DIRECTION	45 DUAL		45 SINGLE		45 SHEAR	
	WELD	VOLUME	WELD	VOLUME	WELD	VOLUME
CCW	88.15	88.15	88.15	88.15	88.15	88.15
CW	88.15	88.15	88.15	88.15	88.15	88.15
UP	75.38	75.38	75.38	75.38	75.38	75.38
DOWN	75.38	75.38	75.38	75.38	75.38	75.38

The coverage achieved was the maximum extent practical with the obstructions in place and is representative of the entire welds. Final examination coverage is calculated at 81.77 percent.

b) The normal VT-2 examination is also performed in conjunction with system leakage testing each refueling outage. This assures that any leakage would be detected prior to gross failure.

6.3 Conclusion

HNP requests approval of the presented alternative to ASME Section XI, IWB-2500, Table IWB-2500-1 requirements for welds STHW-RV-04 and CHW-RV-17.

As documented in Sections 6.1 and 6.2 of this Request, the examinations performed for welds STHW-RV-04 and CHW-RV-17 during the reactor vessel examination and the associated leakage testing provide reasonable assurance of the continued structural integrity of the subject RPV welds and ensure an acceptable level of quality and safety.

7.0 DURATION OF PROPOSED ALTERNATIVE

This relief request is applicable to the Second Ten-Year Inservice Inspection Interval for HNP, in effect from February 2, 1998, through and including May 1, 2008.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
10 CFR 50.55a RELIEF REQUEST: 2R1-019

8.0 PRECEDENT

A similar request for relief, HNP First 10-Year Inservice Inspection Interval Relief Request R1-011B (Part 1), was approved on September 11, 1998, for welds STHW-RV-04 and CHW-RV-17:

NRC Docket No. 50-400
TAC No. MA0433

8.1 Changes in Circumstances

During the first interval, these examinations were performed by a different vendor using different equipment, resulting in different coverage limitations. In addition, the second interval UT Examinations were performed with examination personnel and examination procedures qualified to ASME Code, Appendix VIII, as administered by the EPRI PDI.

The circumstances and basis for the previous NRC approval have not changed from the first 10-year approval to the current second 10-year request.

The following changes in technology with regard to the inspection or testing have been incorporated:

UT Examinations were performed with examination personnel and examination procedures qualified to ASME Code, Appendix VIII, as administered by the EPRI PDI.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
10 CFR 50.55a RELIEF REQUEST: 2R1-020

Request for Relief for Limited Coverage for Welds in Examination Category B-A in Accordance with 10CFR50.55a(g)(5)(iii)
--Inservice Inspection Impracticality--

1.0 ASME CODE COMPONENTS AFFECTED

(a) Description:

Limited coverage for two Pressure Retaining Welds in Reactor Vessel
Examination Category B-A
Item Number: B1.30, "Shell to Flange Weld"
Item Number: B1.40, "Head to Flange Weld"

(b) Function:

Pressure Retaining Welds in Reactor Vessel

(c) Class:

ASME Code Class 1

(d) Component Numbers:

FTSW-RV-01	Vessel Flange to Upper Shell Weld
FTHW-RV-18	Vessel Flange to Head Weld

(e) Previous 10-Year Interval Approval:

Relief Request R1-011 (SERIAL: HNP-97-217), submitted December 16, 1997, for Harris Nuclear Plant (HNP's) First 10-Year Inservice Inspection Interval. NRC approval letter (TAC NO. MA0433) and associated Safety Evaluation dated September 11, 1998, for Relief Request R1-011.

Relief Request R1-004 (SERIAL: NLS-88-026), submitted January 28, 1988, for HNP's First 10-Year Inservice Inspection Interval, based on the Preservice Inspection Program (PSI). NRC approval letter (TAC NO. 67180) and associated Safety Evaluation dated September 30, 1988, for Relief Request R1-004.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
10 CFR 50.55a RELIEF REQUEST: 2R1-020

2.0 APPLICABLE CODE EDITION AND ADDENDA

American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, 1989 Edition with no Addenda.

3.0 APPLICABLE CODE REQUIREMENT

ASME Section XI, IWB-2500, "Examination and Pressure Test Requirements," specifies: "(a) Components shall be examined and tested as specified in Table IWB-2500-1. The method of examination for the components and parts of the pressure retaining boundaries shall comply with those tabulated in Table IWB-2500-1...."

Table IWB-2500-1, "Examination Categories," Examination Category B-A (Pressure Retaining Welds in Reactor Vessel), requires that all welds (Notes 2, 4) in Item No. B1.30, Shell-To-Flange Weld, meet the volumetric examination requirements of Fig. No. IWB-2500-4. Note 2 in this Table specifies that the examination include essentially 100 percent of the weld length. Therefore, weld FTSW-RV-01, Vessel Flange to Upper Shell Weld, must meet these examination criteria.

Table IWB-2500-1 also requires that all welds (Note 2) in Item No. B1.40, Head-to-Flange Weld, meet the volumetric and surface examination requirements of Fig. No. IWB-2500-5. Note 2 identifies that the inspection include essentially 100 percent of the weld length. Therefore, welds FTHW-RV-18 Vessel Flange to Head Weld, must meet these examination criteria.

HNP has adopted ASME Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 Welds," applicable when the entire examination volume or area cannot be examined due to interference by another component or part geometry. Under such circumstances, a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted provided that the reduction in coverage for that weld is less than 10 percent.

4.0 IMPRACTICALITY OF COMPLIANCE

In accordance with the guidelines of 10 CFR 50.55a(g)(5)(iii), relief is requested since the Reactor Pressure Vessel (RPV) welds would have to be redesigned and modified for HNP to achieve 100 percent volumetric coverage. The specific welds are inaccessible for inspection by physical obstructions and geometric surface conditions, restricting complete examination coverage and resulting in the impracticality of performing 100 percent volumetric examination on these welds. Design modifications to the RPV would be required to gain access for such examination.

This design restriction makes compliance with the ASME XI, IWB-2500, Code required examination coverage requirements impractical. To meet these ASME Code requirements, reactor vessel modifications or the replacement of components would be needed.

5.0 BURDEN CAUSED BY COMPLIANCE

The HNP reactor vessel is a typical 3-loop Westinghouse Pressurized Water Reactor design with obstructions located within the reactor vessel which physically prevent the amount of Ultrasonic (UT) Examination coverage that can be achieved for certain welds. This design configuration makes compliance with the ASME Code-required examination coverage requirements impractical. Plant modifications or replacement of components would be needed to permit complete coverage per the ASME Code requirements, imposing a significant burden on HNP.

The limitation that reduces the amount of UT examination coverage for Vessel Flange to Upper Shell Weld FTSW-RV-01 is the vessel configuration at the flange. The examination of the reactor vessel for the Second Ten-Year Inservice Inspection Interval, conducted during the period of April 17, 2006 through April 20, 2006, confirmed that the required "essentially 100 percent" volumetric examination coverage of FTSW-RV-01 per Fig. No. IWB-2500-4 was not achievable due to nonconductive geometric surface conditions that prevent sufficient sound propagation into the weld examination volume at specific locations.

Attempting to perform supplemental examinations from the outside surface would require extensive surface preparation and result in unwarranted dose without a commensurate increase in the level of reliability, quality or safety. Although the UT examinations were performed to the maximum extent practical, the examination of welds for the Second Ten-Year Inservice Inspection Interval did not achieve the required "essentially 100 percent" examination coverage.

The limitations for the Vessel Flange to Head Welds FTHW-RV-18 are due to the component configuration (flange directly adjacent to the weld) and the vessel head lifting lugs. Although the UT examinations were performed to the maximum extent practical, the examination of welds for the Second Ten-Year Inservice Inspection Interval conducted during April of 2000 did not achieve the required "essentially 100 percent" examination coverage.

To gain additional coverage, the Reactor Vessel would require design modifications which are not possible. Therefore, it would be an undue burden for HNP to attain the required 100 percent volumetric inspection.

6.0 PROPOSED ALTERNATIVE AND BASIS FOR USE

HNP is proposing to volumetrically UT examine the RPV pressure retaining welds FTSW-RV-01 and FTHW-RV-18 to the maximum extent possible in accordance with the Inservice Inspection Program schedule. In addition, these welds are subject to visual (VT-2) system leakage test during each refueling outage.

6.1 Vessel Flange to Upper Shell Weld (FTSW-RV-01)

a) Weld FTSW-RV-01 is located at the upper shell to flange. The configuration of the vessel at this weld limits the amount of achievable coverage. UT examinations performed with examination personnel and examination procedures qualified to Regulatory Guide 1.150 and ASME Code, Appendix VIII, as administered by the EPRI Performance Demonstration Initiative (PDI), achieved the following examination coverage percentages:

BEAM DIRECTION	45 DUAL		45 SINGLE		45 SHEAR		MANUAL EXAMINATIONS (0, 6 in, 6 out, 12, 16)	
	WELD	VOL	WELD	VOL	WELD	VOL	WELD	VOL
CCW	100	50	100	50	100	50		
CW	100	50	100	50	100	50		
UP	100*	100*	100*	100*	100*	100*		
DOWN	100*	100*	100*	100*	100*	100*	100*	100*

* Combination of manual and automated scanning

The coverage that was achieved was the maximum extent of coverage practical with the configuration and obstructions in place, with results representative of the entire weld. Final examination coverage is calculated at 87.50 percent.

b) The normal VT-2 Examination is performed in conjunction with system leakage testing each refueling outage. This assures that any leakage would be detected prior to gross failure.

6.2 Vessel Flange to Head Weld (FTHW-RV-18)

a) Weld FTHW-RV-18 is located on the vessel head at the flange. The configuration of the head at this weld limits the amount of achievable coverage. A manual UT examination performed with examination personnel and examination procedures qualified to ASME Code, Section XI and Regulatory Guide 1.150 achieved the following percentages:

BEAM DIRECTION	0 SINGLE	45 AND 60
COVERAGE	65	
CIRCUMFERENTIAL SCAN		65
AXIAL SCAN		85

The coverage achieved was the maximum extent of practical with the configuration and obstructions in place and representative of the entire welds. Final examination coverage is calculated at 71.70 percent.

b) The normal VT-2 Examination is performed in conjunction with system leakage testing each refueling outage. This assures that any leakage would be detected prior to gross failure.

c) The required Magnetic Particle Testing Examination is also performed in accordance with the ASME Code Section XI.

6.3 Conclusion

HNP requests approval of the presented alternatives to ASME Section XI, IWB-2500, Table IWB-2500-1 requirements for welds FTSW-RV-01 and FTHW-RV-18.

As documented in Sections 6.1 and 6.2 of this Request, the examinations already performed for welds FTSW-RV-01 and FTHW-RV-18 during the second ten-year interval examinations and the associated system leakage testing each refueling outage provide reasonable assurance of the continued structural integrity of the subject RPV welds and ensure an acceptable level of quality and safety.

7.0 DURATION OF PROPOSED ALTERNATIVE

This relief request is applicable to the Second Ten-Year Inservice Inspection Interval for HNP, in effect from February 2, 1998, through and including May 1, 2008.

8.0 PRECEDENT

A similar request for relief, HNP First 10-year Inservice Inspection Interval Relief Request R1-011B, was approved on September 11, 1998, for FTSW-RV-01:

NRC Docket No. 50-400
TAC No. MA0433

A similar request for relief, HNP First 10-year Inservice Inspection Interval Relief Request R1-004, was approved on September 30, 1998, for FTHW-RV-18:

NRC Docket No. 50-400
TAC No. 67180

8.1 Changes in Circumstances

During the first interval, these examinations were performed by a different vendor using different equipment, resulting in different coverage limitations. In addition, the second interval UT Examinations were performed with examination personnel and examination procedures qualified to ASME Code, Appendix VIII, as administered by the EPRI PDI.

The circumstances and basis for the previous NRC approval have not changed from the first 10-year approval to the current second 10-year request.

The following changes in technology with regard to the inspection or testing have been incorporated:

UT Examinations were performed with examination personnel and examination procedures qualified to ASME Code, Appendix VIII, as administered by the EPRI PDI.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
10 CFR 50.55a RELIEF REQUEST: 2R1-021

Request for Relief for Limited Coverage for Welds in Examination Category B-D in Accordance with 10CFR50.55a(g)(5)(iii)
--Inservice Inspection Impracticality--

1.0 ASME CODE COMPONENTS AFFECTED

(a) Description:

Limited coverage for six Pressure Retaining Welds in Pressurizer Vessel Examination Category B-D, Full Penetration Welds of Nozzles in Vessels – Inspection Program B
Item Number: B3.110, "Pressurizer Nozzle-to-Vessel Welds"

(b) Function:

Full Penetration Welds of Nozzles in Vessels

(c) Class:

ASME Code Class 1

(d) Component Numbers:

NTHW-08	Pressurizer Nozzle to Head Weld
NTHW-09	Pressurizer Nozzle to Head Weld
NTHW-10	Pressurizer Nozzle to Head Weld
NTHW-11	Pressurizer Nozzle to Head Weld
NTHW-12	Pressurizer Nozzle to Head Weld
NTHW-13	Pressurizer Nozzle to Head Weld

(e) Previous 10-Year Interval Approval:

Relief Request R1-006 (SERIAL: NLS-88-026), submitted January 28, 1988, for Harris Nuclear Plant (HNP's) First 10-Year Inservice Inspection Interval. NRC approval letter (TAC NO. 67180) and associated Safety Evaluation dated September 30, 1988, for Relief Request R1-006.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
10 CFR 50.55a RELIEF REQUEST: 2R1-021

2.0 APPLICABLE CODE EDITION AND ADDENDA

American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, 1989 Edition with no Addenda.

3.0 APPLICABLE CODE REQUIREMENT

ASME Section XI, IWB-2500, "Examination and Pressure Test Requirements," specifies: "(a) Components shall be examined and tested as specified in Table IWB-2500-1. The method of examination for the components and parts of the pressure retaining boundaries shall comply with those tabulated in Table IWB-2500-1 ...."

Table IWB-2500-1, "Examination Categories," Examination Category B-D (Full Penetration Welds of Nozzles in Vessels – Inspection Program B), requires that all nozzles (Note 1) in Item No. B3.110, Pressurizer Nozzle-to-Vessel Welds, meet the volumetric examination requirements of Fig. No. IWB-2500-7 (Note 4).

Note 1 in this Table identifies that the examination includes nozzles with full penetration welds to vessel shell (or head) and integrally cast nozzles, but excludes manways and handholes either welded to or integrally cast in vessel. According to Note 4, the examination volumes shall apply to the applicable Figure shown in Figs. IWB-2500-7(a) through (d). Therefore, nozzle welds NTHW-08/-09/-10/-11/-12/-13, Pressurizer Nozzle to Head Weld, must meet these examination criteria.

HNP has adopted ASME Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 Welds," applicable when the entire examination volume or area cannot be examined due to interference by another component or part geometry. Under such circumstances, a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted provided that the reduction in coverage for that weld is less than 10 percent.

4.0 IMPRACTICALITY OF COMPLIANCE

In accordance with the guidelines of 10 CFR 50.55a(g)(5)(iii), relief is requested since the subject pressurizer nozzle welds would have to be redesigned and refabricated for HNP to achieve 100 percent volumetric coverage. Per the applicable section of the ASME B&PV Code Section XI, nozzle-to-vessel welds require volumetric examination from two sides of the weld for 100 percent completion. However, due to nozzle configurations of these components, Ultrasonic (UT) examinations are limited to scanning primarily on the shell-side of the nozzle welds. The shell-side examination of the surge nozzle is additionally limited due to permanent heater obstructions. Volumetric

examinations in limited areas will be accomplished as a best effort attempt to cover as much of the Code-required area or volume as possible.

Due to this design restriction, it is impractical for HNP to comply with the ASME XI, IWB-2500, Code required examination coverage. For these Code requirements to be met, pressurizer vessel modifications or the replacement of components would be needed.

5.0 BURDEN CAUSED BY COMPLIANCE

The HNP is a typical 3-loop Westinghouse Pressurized Water Reactor design with nozzle to vessel weld design configuration which physically prevents the amount of UT Examination coverage that can be achieved for certain welds. This design configuration makes compliance with the ASME Code-required examination coverage requirements impractical.

Plant modifications or replacement of components would be needed to permit complete coverage per the ASME Code requirements, imposing a significant burden on HNP. Nozzle to vessel welds are not conducive to the two-sided volumetric examinations due to nozzle configuration. Although obstructions, as part of the component design, prevent access to the full weld volume to perform 100 percent volumetric examination, a significant percentage of the Code-required examination was performed. Completion of the remainder of the inspections would require redesign and refabrication of the components.

6.0 PROPOSED ALTERNATIVE AND BASIS FOR USE

HNP is proposing to volumetrically UT examine the pressure retaining nozzle to vessel welds NTHW-08/-09/-10/-11/-12/-13 to the maximum extent possible in accordance with the Inservice Inspection Program schedule. A significant portion of the subject welds were examined, obtaining greater than 65 percent coverage for each nozzle to vessel weld.

The normal Visual (VT-2) Examination is performed in conjunction with system leakage testing each refueling outage. This assures that any leakage would be detected prior to gross nozzle failure.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
10 CFR 50.55a RELIEF REQUEST: 2R1-021

6.1 Pressurizer Nozzle to Head Weld (NTHW-08)

a) Weld NTHW-08 is the surge nozzle weld located at the bottom of the Pressurizer centered within the 78 Pressurizer heaters. UT examinations performed with examination personnel and examination procedures qualified to ASME Code, Section XI, achieved the following examination coverage percentages:

Beam Direction	Coverage Achieved
0 degree	79.6 %
Parallel direction 45° shear and 60° shear	79.6 %
Axial direction	38.7 %

The combined UT examination coverage total is 66 percent.

b) The normal VT-2 Examination is also performed in conjunction with system leakage testing each refueling outage. This assures that any leakage would be detected prior to gross nozzle failure.

6.2 Pressurizer Nozzle to Head Weld (NTHW-09)

a) Weld NTHW-09 is the spray nozzle weld located top dead center of the Pressurizer. The design configuration of this nozzle to vessel weld makes compliance with the ASME Code-required examination coverage requirements impractical. UT examinations performed with examination personnel and examination procedures qualified to ASME Code, Section XI, achieved the following examination coverage percentages:

BEAM DIRECTION AXIAL COVERAGE	TOTAL COVERAGE		BEAM DIRECTION CIRCUMFERENTIAL COVERAGE	TOTAL COVERAGE	
	45 DEG	60 DEG		45 DEG	60 DEG
TOWARD HEAD BASE MATERIAL	24.89 %	14.62 %	HEADSIDE WELD	100 %	100 %
TOWARD HEAD WELD	12.51 %	15.21 %	HEADSIDE BASE MATERIAL	100 %	100 %
TOWARD NOZZLE BASE MATERIAL	87.24 %	90.08 %	NOZZLE SIDE WELD	100 %	100 %
TOWARD NOZZLE WELD	100 %	100 %	NOZZLE SIDE BASE MATERIAL	18.18 %	18.18%

Total weld volume coverage 0 degrees 66.31 percent
Total weld volume coverage 45 degrees 67.85 percent
Total weld volume coverage 60 degrees 67.26 percent

The coverage that was achieved was the maximum extent of coverage practical with the configuration and obstructions in place and results are representative of the entire weld. Final examination coverage is calculated at 67.14 percent.

b) The normal VT-2 examination is also performed in conjunction with system leakage testing each refueling outage. This assures that any leakage would be detected prior to gross nozzle failure.

6.3 Pressurizer Nozzle to Head Welds (NTHW-10, NTHW-11 and NTHW-12)

a) Welds NTHW-10, NTHW-11 and NTHW-12 are the three safety nozzle welds located off center on the top of the Pressurizer. The design configuration of these nozzle to vessel welds makes compliance with the ASME Code-required examination coverage requirements impractical. UT examinations performed with examination personnel and examination procedures qualified to ASME Code, Section XI, achieved the following examination coverage percentages:

BEAM DIRECTION AXIAL COVERAGE	TOTAL COVERAGE		BEAM DIRECTION CIRCUMFERENTIAL COVERAGE	TOTAL COVERAGE	
	45 DEG	60 DEG		45 DEG	60 DEG
TOWARD HEAD BASE MATERIAL	24.89 %	14.62 %	HEADSIDE WELD	100 %	100 %
TOWARD HEAD WELD	12.51 %	15.21 %	HEADSIDE BASE MATERIAL	100 %	100 %
TOWARD NOZZLE BASE MATERIAL	87.24 %	90.08 %	NOZZLE SIDE WELD	100 %	100 %
TOWARD NOZZLE WELD	100 %	100 %	NOZZLE SIDE BASE MATERIAL	18.18 %	18.18%

Total weld volume coverage 0 degrees 66.31 percent
Total weld volume coverage 45 degrees 67.85 percent
Total weld volume coverage 60 degrees 67.26 percent

The coverage that was achieved was the maximum extent of coverage practical with the configuration and obstructions in place and the results are representative of the entire weld. Final examination coverage is calculated at 67.14 percent.

b) The normal VT-2 examination is also performed in conjunction with system leakage testing each refueling outage. This assures that any leakage would be detected prior to gross nozzle failure.

6.4 Pressurizer Nozzle to Head Weld (NTHW-13)

a) Weld NTHW-13 is the relief nozzle weld located off center on the top of the Pressurizer. The design configuration of this nozzle to vessel weld makes compliance with the ASME Code-required examination coverage requirements impractical. UT examinations performed with examination personnel and examination procedures qualified to ASME Code, Section XI, achieved the following examination coverage percentages:

BEAM DIRECTION AXIAL COVERAGE	TOTAL COVERAGE		BEAM DIRECTION CIRCUMFERENTIAL COVERAGE	TOTAL COVERAGE	
	45 DEG	60 DEG		45 DEG	60 DEG
TOWARD HEAD BASE MATERIAL	24.89 %	14.62 %	HEADSIDE WELD	100 %	100 %
TOWARD HEAD WELD	12.51 %	15.21 %	HEADSIDE BASE MATERIAL	100 %	100 %
TOWARD NOZZLE BASE MATERIAL	87.24 %	90.08 %	NOZZLE SIDE WELD	100 %	100 %
TOWARD NOZZLE WELD	100 %	100 %	NOZZLE SIDE BASE MATERIAL	18.18 %	18.18 %

Total weld volume coverage 0 degrees 66.31 percent
Total weld volume coverage 45 degrees 67.85 percent
Total weld volume coverage 60 degrees 67.26 percent

The coverage that was achieved was the maximum extent of coverage practical with the configuration and obstructions in place and results are representative of the entire weld. Final examination coverage is calculated at 67.14 percent.

b) The normal VT-2 examination is also performed in conjunction with system leakage testing each refueling outage. This assures that any leakage would be detected prior to gross nozzle failure.

Note: Due to the same configuration for each of the nozzle-to-head welds, the examination completion percentages are identical for NTHW-09/-10/-11/-12/-13.

6.5 Conclusion

HNP requests approval of the presented alternatives to ASME Section XI, IWB-2500, Table IWB-2500-7 requirements for welds NTHW-08/-09/-10/-11/-12/-13.

As documented in Sections 6.1, 6.2, 6.3 and 6.4 of this Request, the examinations performed for pressurizer nozzle welds NTHW-08/- 09/-10/-11/-12/-13 during the second ten-year interval examinations and the associated system leakage testing provide reasonable assurance of the continued structural integrity of the subject welds.

7.0 DURATION OF PROPOSED ALTERNATIVE

This relief request is applicable to the Second Ten-Year Inservice Inspection Interval for HNP, in effect from February 2, 1998, through and including May 1, 2008.

8.0 PRECEDENT

A similar request for relief, HNP First 10-Year Inservice Inspection Interval Relief Request R1-006, was approved on September 30, 1988, for NTHW-08/-09/-10/-11/-12/-13:

NRC Docket No. 50-400
TAC No. 67180

8.1 Changes in Circumstances

The circumstances and basis for the previous NRC approval have not changed from the first 10-year approval to the current second 10-year request.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
10 CFR 50.55a RELIEF REQUEST: 2R1-022

Request for Relief for Limited Coverage for Welds in Examination Category B-B in Accordance with 10CFR50.55a(g)(5)(iii)
--Inservice Inspection Impracticality--

1.0 ASME CODE COMPONENTS AFFECTED

(a) Description:

Limited coverage for one Steam Generator (Primary Side) Weld
Examination Category B-B, Pressure Retaining Welds in Vessels Other Than Reactor Vessels
Item Number: B2.40, "Tubesheet-to-Head Weld"

(b) Function:

Pressure Retaining Welds in Vessels Other Than Reactor Vessels
Tubesheet-to-Head Weld

(c) Class:

ASME Code Class 1

(d) Component Number:

II-SG-001SGA-TSTHW-06-1 Tubesheet-to-Head Weld

(e) Previous 10-Year Interval Approval:

Relief Request R1-004 (SERIAL: NLS-88-026), submitted January 28, 1988, for Harris Nuclear Plant (HNP's) First 10-Year Inservice Inspection Interval. NRC approval letter (TAC NO. 67180) and associated Safety Evaluation dated September 30, 1988, for Relief Request R1-004 (Part 3 of 3).

2.0 APPLICABLE CODE EDITION AND ADDENDA

American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, 1989 Edition with no Addenda.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
10 CFR 50.55a RELIEF REQUEST: 2R1-022

3.0 APPLICABLE CODE REQUIREMENT

ASME Section XI, IWB-2500, "Examination and Pressure Test Requirements," specifies: "(a) Components shall be examined and tested as specified in Table IWB-2500-1. The method of examination for the components and parts of the pressure retaining boundaries shall comply with those tabulated in Table IWB-2500-1 ...."

Table IWB-2500-1, "Examination Categories," Examination Category B-B (Pressure Retaining Welds in Vessels Other Than Reactor Vessels), requires that all welds (Notes 1, 4) in Item No. B2.40, Steam Generator (Primary Side) Tubesheet-to-Head Weld, meet the volumetric examination requirements of Fig. No. IWB-2500-6.

Note 1 in this Table, applicable to the second and successive inspection intervals, identifies that the examination may be limited to one vessel among the group of vessels performing a similar function. Note 4 details that this examination be essentially 100 percent of the weld length. Therefore, Tubesheet-to-Head Weld, II-SG-001SGA-TSTHW-06-1, must meet these examination criteria.

HNP has adopted ASME Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 Welds," applicable when the entire examination volume or area cannot be examined due to interference by another component or part geometry. Under such circumstances, a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted provided that the reduction in coverage for that weld is less than 10 percent.

4.0 IMPRACTICALITY OF COMPLIANCE

In accordance with the guidelines of 10 CFR 50.55a(g)(5)(iii), relief is requested since the subject steam generator Tubesheet-to-Head weld would have to be redesigned and refabricated for HNP to achieve 100 percent volumetric coverage. The specific weld is inaccessible for inspection by physical obstructions and geometric surface conditions, restricting complete examination coverage and resulting in the impracticality of performing 100 percent volumetric examination on this weld. Design modifications to the steam generator would be required to gain access for such examination.

This design configuration and its resultant restrictions make compliance with the ASME Code-required Section XI, IWB-2500 examination coverage requirements impractical. To allow for complete examination coverage in accordance with the specified ASME Code requirements, Steam Generator modifications or the replacement of components would be needed.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
10 CFR 50.55a RELIEF REQUEST: 2R1-022

5.0 BURDEN CAUSED BY COMPLIANCE

The HNP is a typical 3-loop Westinghouse Pressurized Water Reactor design with obstructions located on the Steam Generator which physically prevent the amount of Ultrasonic (UT) Examination coverage that can be achieved for the Tubesheet-to-Head weld. This design configuration makes compliance with the ASME Code-required examination coverage requirements impractical. Plant modifications or replacement of components would be needed to permit complete coverage per the ASME Code requirements, imposing a significant burden on HNP.

The limitation that reduces the amount of UT examination coverage for Tubesheet-to-Head weld II-SG-001SGA-TSTHW-06-1 is the vessel configuration at the flange and the four pedestal generator supports. Attempting to perform supplemental examinations from the inside surface would result in unwarranted dose without a commensurate increase in the level of reliability, quality or safety. Although the UT examinations were performed to the maximum extent practical, the examination of these welds for the Second Ten-Year Inservice Inspection Interval did not achieve the required "essentially 100 percent" examination coverage.

6.0 PROPOSED ALTERNATIVE AND BASIS FOR USE

HNP is proposing to volumetrically UT examine the steam generator Tubesheet-to-head weld, II-SG-001SGA-TSTHW-06-1, to the maximum extent possible in accordance with the Inservice Inspection Program schedule. In addition, the subject weld will be subject to system pressure tests during each refueling outage.

a) A 0 degree, a 45 degree and a 60 degree UT examination performed to the maximum extent possible, with examination personnel and examination procedures qualified to ASME Code, Section XI, achieved 74.20 percent of the base metal required volume and 70.11 percent of the weld required volume.

Total base metal volume coverage 0 degrees	72.74 percent
Total base metal volume coverage 45 degrees	73.38 percent
Total base metal volume coverage 60 degrees	76.48 percent
Total base metal volume coverage	74.20 percent
Total weld volume coverage 0 degrees	76.60 percent
Total weld volume coverage 45 degrees	68.85 percent
Total weld volume coverage 60 degrees	64.87 percent
Total weld volume coverage	70.11 percent

b) The normal Visual (VT-2) Examination is also performed in conjunction with system leakage testing each refueling outage. This assures that any leakage would be detected prior to gross piping failure.

6.1 Conclusion

HNP requests approval of the presented alternatives to ASME Section XI, IWB-2500, Table IWB-2500-6 requirements for weld II-SG-001SGA-TSTHW-06-1.

Volumetric UT examinations were performed for weld II-SG-001SGA-TSTHW-06-1 to the maximum extent possible and the welds are subject to VT-2 examinations during refueling outages. The volume of coverage obtained during the weld examinations and the associated pressure testing performed on the weld provides reasonable assurance of the continued structural integrity of the weld and ensures an acceptable level of quality and safety.

7.0 DURATION OF PROPOSED ALTERNATIVE

This relief request is applicable to the Second Ten-Year Inservice Inspection Interval for HNP, in effect from February 2, 1998, through and including May 1, 2008.

8.0 PRECEDENT

Relief Request R1-004 (Part 3 of 3) for HNP's First 10-Year Inservice Inspection Interval was approved on September 30, 1988, for II-SG-001SGA-TSTHW-06-1:

NRC Docket No. 50-400
TAC No. 67180

8.1 Changes in Circumstances

The circumstances and basis for the previous NRC approval have not changed from the first 10-year approval to the current second 10-year request.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
10 CFR 50.55a RELIEF REQUEST: 2R2-009

Request for Relief for Limited Coverage for Welds in Examination Category C-A in Accordance with 10 CFR 50.55a(g)(5)(iii)
--Inservice Inspection Impracticality--

1.0 ASME CODE COMPONENTS AFFECTED

(a) Description:

Limited coverage for one Residual Heat Removal Heat Exchanger Circumferential Shell Weld in Examination Category C-A, Pressure Retaining Welds in Pressure Vessels
Item Number: C1.10, "Shell Circumferential Welds"

(b) Function:

Pressure Retaining Welds in Pressure Vessels

(c) Class:

ASME Code Class 2

(d) Component Number:

II-RHR-01RHRA-CSW-02	Residual Heat Removal Heat Exchanger Circumferential Shell Weld

(e) Previous 10-Year Interval Approval:

Relief Request R2-005 (SERIAL: NLS-88-026), submitted January 28, 1988, for Harris Nuclear Plant (HNP's) First 10-Year Inservice Inspection Interval. NRC approval letter (TAC NO. 67180) and associated Safety Evaluation dated September 30, 1988.

2.0 APPLICABLE CODE EDITION AND ADDENDA

American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, 1989 Edition with no Addenda.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
10 CFR 50.55a RELIEF REQUEST: 2R2-009

3.0 APPLICABLE CODE REQUIREMENT

ASME Code, Section XI, Table IWC-2500-1, Examination Category C-A, Item C1.10, Note 1 requires essentially 100 percent volumetric examinations, as defined by Figure IWC-2500-1, of the Class 2 shell circumferential welds in pressure vessels.

HNP has adopted ASME Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 Welds," applicable when the entire examination volume or area cannot be examined due to interference by another component or part geometry. Under such circumstances, a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted provided that the reduction in coverage for that weld is less than 10 percent.

4.0 IMPRACTICALITY OF COMPLIANCE

In accordance with the guidelines of 10 CFR 50.55a(g)(5)(iii), relief is requested since the pressure vessel weld would have to be redesigned and modified for HNP to achieve 100 percent volumetric coverage. The specific weld is inaccessible for inspection by physical obstructions and geometric surface conditions, restricting complete examination coverage and resulting in the impracticality of performing 100 percent volumetric examination on these welds. Design modifications would be required to gain access for such examination.

This design restriction makes compliance with the ASME Section XI, IWC-2500-1, Code required examination coverage requirements impractical. To meet these ASME Code requirements, reactor vessel modifications or the replacement of components would be needed

5.0 BURDEN CAUSED BY COMPLIANCE

Weld configuration (flange to shell) and obstructions (flange bolting) prevent 100 percent volumetric examination to be performed during inservice inspection activities. Per ASME Code, circumferential shell welds require volumetric examination from two sides of the weld in order to be 100 percent complete. However, due to the restricted access caused by the flange interference and the flange bolting, Ultrasonic (UT) examinations are limited.

6.0 PROPOSED ALTERNATIVE AND BASIS FOR USE

HNP is proposing to volumetrically UT examine the restricted areas of Weld RHRA-CSW-02 to the maximum extent possible in accordance with the Inservice Inspection Program schedule. In addition, this weld is subject to visual (VT-2) system leakage testing during each refueling period.

6.1 Residual Heat Removal Heat Exchanger Circumferential Shell Weld (RHRA-CSW-02)

a) Weld RHRA-CSW-02 is the shell to flange weld of the Residual Heat Removal Heat Exchanger Circumferential Shell Weld. UT examinations performed with examination personnel and examination procedures qualified to ASME Code, Section XI, Appendix III, achieved the following examination coverage percentages, for a total coverage of 66.50 percent of the weld:

BEAM DIRECTION AXIAL COVERAGE	TOTAL COVERAGE	BEAM DIRECTION CIRCUMFERENTIAL COVERAGE	TOTAL COVERAGE
TOWARD FLANGE	96.01 %	FLANGE SIDE	31.37 %
TOWARD SHELL	38.63 %	SHELL SIDE	100 %

b) To supplement the volumetric examination, a 70 degree ½ vee shear wave UT examination was performed. A code compliant surface examination (PT) was also performed, although not required by code.

c) The normal VT-2 examination is also performed in conjunction with system leakage testing each refueling period.

6.2 Conclusion

HNP requests approval of the presented alternatives to ASME Section XI, IWC-2500, Table IWC-2500-1 requirements for weld RHRA-CSW-02.

As documented in Section 6.1 of this Request, the examinations performed for weld RHRA-CSW-02 during the Second Ten-Year Interval examinations and the associated system leakage testing each refueling period provide reasonable assurance of the continued structural integrity of the subject weld and ensure an acceptable level of quality and safety.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
10 CFR 50.55a RELIEF REQUEST: 2R2-009

7.0 DURATION OF PROPOSED ALTERNATIVE

This relief request is applicable to the Second Ten-Year Inservice Inspection Interval for HNP, in effect from February 2, 1998, through and including May 1, 2008.

8.0 PRECEDENT

A similar request for relief, HNP First 10-year Inservice Inspection Interval Relief Request R2-005, was approved on September 30, 1998, for RHRA-CSW-02:

NRC Docket No. 50-400
TAC No. 67180

8.1 Changes in Circumstances

The circumstances and basis for the previous NRC approval have not changed from the first 10-year approval to the current second 10-year request.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
10 CFR 50.55a RELIEF REQUEST: 2R2-010

Request for Relief for Limited Coverage for Welds in Examination Category C-B in Accordance with 10CFR50.55a(g)(5)(iii)
--Inservice Inspection Impracticality--

1.0 ASME CODE COMPONENTS AFFECTED

(a) Description:

Limited coverage for two Boron Injection Tank Nozzle to Vessel Welds in Examination Category C-B, Pressure Retaining Nozzle Welds in Vessels Item Number: C2.21, "Nozzle to Shell Weld"

(b) Function:

Pressure Retaining Nozzle Welds in Vessels

(c) Class:

ASME Code Class 2

(d) Component Number:

II-BIT -01NTHW-03	Outlet Nozzle to Head Weld
II-BIT -01NTHW-04	Inlet Nozzle to Head Weld

(e) Previous 10-Year Interval Approval:

Relief Request R2-005 (SERIAL: NLS-88-026), submitted January 28, 1988, for Harris Nuclear Plant (HNP's) First 10-Year Inservice Inspection Interval. NRC approval letter (TAC NO. 67180) and associated Safety Evaluation dated September 30, 1988.

2.0 APPLICABLE CODE EDITION AND ADDENDA

American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, 1989 Edition with no Addenda.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
10 CFR 50.55a RELIEF REQUEST: 2R2-010

3.0 APPLICABLE CODE REQUIREMENT

ASME Code, Section XI, Table IWC-2500-1, Examination Category C-B, Item C2.21, requires surface and volumetric examination of all nozzles at terminal ends (Note 1) of piping runs (Note 2), as defined by Figure IWC-2500-4 (a) or (b), of the Class 2 nozzle welds in vessels.

Note 1 specifies that the extent of examination includes nozzles welded to or integrally cast in vessels that connect to piping runs, with manways and handholes excluded.

HNP has adopted ASME Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 Welds," applicable when the entire examination volume or area cannot be examined due to interference by another component or part geometry. Under such circumstances, a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted provided that the reduction in coverage for that weld is less than 10 percent.

4.0 IMPRACTICALITY OF COMPLIANCE

In accordance with the guidelines of 10 CFR 50.55a(g)(5)(iii), relief is requested since the subject nozzle to shell welds would have to be redesigned and refabricated for HNP to achieve 100 percent volumetric coverage. Per the applicable section of the ASME Code, nozzle to shell welds require volumetric (UT) examination from two sides of the weld for 100 percent completion. However, due to nozzle configurations of these components, UT examinations are limited to scanning primarily on the shell-side of the nozzle welds. Volumetric examinations in limited areas will be accomplished as a best effort attempt to cover as much of the Code-required area or volume as possible.

This design restriction makes compliance with the ASME XI, IWC-2500-1, Code required examination coverage requirements impractical. To meet these ASME Code requirements, vessel modifications or the replacement of components would be needed.

5.0 BURDEN CAUSED BY COMPLIANCE

The HNP is a typical 3-loop Westinghouse Pressurized Water Reactor design with typical nozzle to shell weld design configuration which physically prevents the amount of Ultrasonic (UT) Examination coverage that can be achieved. This design configuration makes compliance with the ASME Code-required examination coverage requirements impractical.

Plant modifications or replacement of components would be needed to permit complete coverage per the ASME Code requirements, imposing a significant burden on HNP. Nozzle to shell welds are not conducive to the two-sided volumetric examinations due to nozzle configuration. Although obstructions, as part of the component design, prevent access to the full weld volume to perform 100 percent volumetric examination, a significant percentage of the Code-required examination was performed. Completion of the remainder of the inspections would require redesign and refabrication of the components.

6.0 PROPOSED ALTERNATIVE AND BASIS FOR USE

HNP is proposing to volumetrically examine the pressure retaining nozzle to vessel welds BIT-01NTHW-03 and BIT-01NTHW-04 to the maximum extent possible in accordance with the Inservice Inspection Program schedule using Ultrasonic (UT) Examination. A significant portion of the subject welds have been examined, obtaining greater than 75 percent coverage for each nozzle to shell weld.

In addition, these welds are subject to visual (VT-2) system leakage testing during each refueling period.

6.1 Outlet Nozzle to Vessel Weld (BIT-01NTHW-03)

a) Weld BIT-01NTHW-03 is the Outlet Nozzle to Head Weld located on the top of the Boron Injection Tank. A 0 degree, 45 degree and 60 degree UT examination was performed with examination personnel and examination procedures qualified to ASME Code, Section XI, achieving 77.14 percent of the required weld volume. In addition the Code required surface examination was completed.

Both BIT-01NTHW-03 and BIT-01NTHW-04 are configured the same, with the same examination limitations:

BEAM DIRECTION AXIAL COVERAGE	TOTAL COVERAGE		BEAM DIRECTION CIRCUMFERENTIAL COVERAGE	TOTAL COVERAGE	
	45 DEG	60 DEG		45 DEG	60 DEG
TOWARD HEAD	0%	0%	HEADSIDE	100%	100%
TOWARD NOZZLE	32%	93.7%	NOZZLE SIDE	100%	100%

Total weld volume coverage 0 degrees: 100 percent
Total weld volume coverage 45 degrees: 58 percent
Total weld volume coverage 60 degrees: 73.43 percent

b) The normal VT-2 examination is also performed in conjunction with system leakage testing each refueling period.

6.2 Inlet Nozzle to Vessel Weld (BIT-01NTHW-04)

a) Weld BIT-01NTHW-04 is the Inlet Nozzle to Head Weld located on the bottom of the Boron Injection Tank. A 0 degree, 45 degree and 60 degree UT examination was performed with examination personnel and examination procedures qualified to ASME Code, Section XI, achieving 77.14 percent of the required weld volume. In addition, the Code required surface examination was completed.

Both BIT-01NTHW-03 and BIT-01NTHW-04 are configured the same, with the same examination limitations:

BEAM DIRECTION AXIAL COVERAGE	TOTAL COVERAGE		BEAM DIRECTION CIRCUMFERENTIAL COVERAGE	TOTAL COVERAGE	
	45 DEG	60 DEG		45 DEG	60 DEG
TOWARD HEAD	0%	0%	HEADSIDE	100%	100%
TOWARD NOZZLE	32%	93.7%	NOZZLE SIDE	100%	100%

Total weld volume coverage 0 degrees: 100 percent
Total weld volume coverage 45 degrees: 58 percent
Total weld volume coverage 60 degrees: 73.43 percent

b) The normal VT-2 examination is also performed in conjunction with system leakage testing each refueling period.

6.3 Conclusion

HNP requests approval of the presented alternatives to ASME Section XI, IWC-2500, Table IWC-2500-1 requirements for welds BIT-01NTHW-03 and BIT-01NTHW-04.

As documented in Sections 6.1 and 6.2 of this Request, the examinations performed for welds BIT-01NTHW-03 and BIT-01NTHW-04 during the Second Ten-Year Interval examinations and the associated system leakage testing each refueling period provide reasonable assurance of the continued structural integrity of the subject weld and ensure an acceptable level of quality and safety.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
10 CFR 50.55a RELIEF REQUEST: 2R2-010

7.0 DURATION OF PROPOSED ALTERNATIVE

This relief request is applicable to the Second Ten-Year Inservice Inspection Interval for HNP, in effect from February 2, 1998, through and including May 1, 2008.

8.0 PRECEDENTS

A similar request for relief, HNP First 10-year Inservice Inspection Interval Relief Request R2-005, was approved on September 30, 1998, for BIT-01NTHW-03 and BIT-01NTHW-04:

NRC Docket No. 50-400
TAC No. 67180

8.1 Changes in Circumstances

The circumstances and basis for the previous NRC approval have not changed from the first 10-year approval to the current second 10-year request.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
10 CFR 50.55a RELIEF REQUEST: 2R2-011

Request for Relief for Limited Coverage for Welds in Examination Category C-A in Accordance with 10 CFR 50.55a(g)(5)(iii)
--Inservice Inspection Impracticality--

1.0 ASME CODE COMPONENTS AFFECTED

(a) Description:

Limited coverage for four welds in Examination Category C-C, Integral Attachments for Vessels, Piping, Pumps and Valves
Item Number: C3.30, "Pumps Integrally Welded Attachments"

(b) Function:

Integrally Welded Attachment

(c) Class:

ASME Code Class 2

(d) Component Number:

II-CSIP-1CSIP-A-WA1	Pump Support Feet
II-CSIP-1CSIP-A-WA2	Pump Support Feet
II-CSIP-1CSIP-A-WA3	Pump Support Feet
II-CSIP-1CSIP-A-WA4	Pump Support Feet

(e) Previous 10-Year Interval Approval:

Relief Request R2-001 (SERIAL: NLS-88-026), submitted January 28, 1988, for Harris Nuclear Plant (HNP's) First 10-Year Inservice Inspection Interval. NRC approval letter (TAC NO. 67180) and associated Safety Evaluation dated September 30, 1988.

2.0 APPLICABLE CODE EDITION AND ADDENDA

American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, 1989 Edition with no Addenda.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
10 CFR 50.55a RELIEF REQUEST: 2R2-011

3.0 APPLICABLE CODE REQUIREMENT

ASME Code, Section XI, Table IWC-2500-1, Examination Category C-C, Item C3.30, requires surface examination of 100 percent of required area of each welded (note 4) attachment, as defined by Figure IWC-2500-5, of the Class 2 pump integrally welded attachment welds.

Per Note 4, the examination is limited to attachments of those components required to be examined under Examination Categories C-F and C-G.

HNP has adopted ASME Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 Welds," applicable when the entire examination volume or area cannot be examined due to interference by another component or part geometry. Under such circumstances, a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted provided that the reduction in coverage for that weld is less than 10 percent.

4.0 IMPRACTICALITY OF COMPLIANCE

In accordance with the guidelines of 10 CFR 50.55a(g)(5)(iii), relief is requested since the Charging Safety Injection Pump integral attachment welds would have to be redesigned and modified for HNP to achieve 100 percent surface examination coverage. Due to configuration and obstructions, it is not possible to perform 100 percent surface (PT) examination without implementing design modifications in order to allow access for the examination.

These design restrictions makes compliance with the ASME Section XI, IWC-2500-1, Code required examination coverage requirements impractical. The modifications to meet these ASME Code requirements would impose a considerable burden on HNP.

5.0 BURDEN CAUSED BY COMPLIANCE

In accordance with the requirements of ASME B&PV Code, Section XI, 1989 Edition with no Addenda, integral welded attachments require surface examination of 100 percent of the required areas of each welded attachment. However, due to the restricted access caused by the configuration of the components, structural support steel limits access to one side of the welded attachment, 100 percent surface examinations are limited.

Plant modifications would be needed to permit complete coverage per the ASME Code requirements, an imposing a significant burden on HNP. Although obstructions, as part

of the component design, prevent access to the full weld to perform 100 percent surface examination, a significant percentage of the Code-required examination was performed. Completion of the remainder of the inspections would Completion require redesign and refabrication of the components.

6.0 PROPOSED ALTERNATIVE AND BASIS FOR USE

Welds II-CSIP-1CSIP-A-WA1, II-CSIP-1CSIP-A-WA2, II-CSIP-1CSIP-A-WA3 and II-CSIP-1CSIP-A-WA4 are integral attachments for the support legs located on the bottom of the Charging Safety Injection Pump.

6.1 Charging Safety Injection Pump integral attachment weld (II-CSIP-1CSIP-A-WA1)

a) A liquid penetrant surface examination performed to the maximum extent possible, with examination personnel and examination procedures qualified to ASME Code, Section XI, achieved 77.10 percent coverage of the required weld area.

b) The normal visual (VT-2) examination is also performed in conjunction with system leakage testing each refueling period.

6.2 Charging Safety Injection Pump integral attachment weld (II-CSIP-1CSIP-A-WA2)

a) A liquid penetrant surface examination performed to the maximum extent possible, with examination personnel and examination procedures qualified to ASME Code, Section XI, achieved 82.35 percent coverage of the required weld area.

b) The normal VT-2 examination is also performed in conjunction with system leakage testing each refueling period.

6.3 Charging Safety Injection Pump integral attachment weld (II-CSIP-1CSIP-A-WA3)

a) A liquid penetrant surface examination performed to the maximum extent possible, with examination personnel and examination procedures qualified to ASME Code, Section XI, achieved 80 percent coverage of the required weld area.

b) The normal VT-2 examination is also performed in conjunction with system leakage testing each refueling period.

6.4 Charging Safety Injection Pump integral attachment weld (II-CSIP-1CSIP-A-WA4)

a) A liquid penetrant surface examination performed to the maximum extent possible, with examination personnel and examination procedures qualified to ASME Code, Section XI, achieved 75 percent coverage of the required weld area.

b) The normal VT-2 examination is also performed in conjunction with system leakage testing each refueling period.

6.5 Conclusion

HNP requests approval of the presented alternatives to ASME Section XI, IWC-2500, Table IWC-2500-1 requirements for welds II-CSIP-1CSIP-A-WA1, II-CSIP-1CSIP-A-WA2, II-CSIP-1CSIP-A-WA3 and II-CSIP-1CSIP-A-WA4.

As documented in Sections 6.1, 6.2, 6.3 and 6.4 of this Request, the examinations performed for welds II-CSIP-1CSIP-A-WA1, II-CSIP-1CSIP-A-WA2, II-CSIP-1CSIP-A-WA3 and II-CSIP-1CSIP-A-WA4 during the Second Ten-Year Interval examinations and the associated system leakage testing each refueling period provide reasonable assurance of the continued structural integrity of the subject weld and ensure an acceptable level of quality and safety.

7.0 DURATION OF PROPOSED ALTERNATIVE

This relief request is applicable to the Second Ten-Year Inservice Inspection Interval for HNP, in effect from February 2, 1998, through and including May 1, 2008.

8.0 PRECEDENT

A similar request for relief, HNP First 10-year Inservice Inspection Interval Relief Request R2-001, was approved on September 30, 1998, for II-CSIP-1CSIP-A-WA1, II-CSIP-1CSIP-A-WA2, II-CSIP-1CSIP-A-WA3 and II-CSIP-1CSIP-A-WA4:

NRC Docket No. 50-400
TAC No. 67180

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
ADDITIONAL INFORMATION FOR SECOND INTERVAL CLOSE-OUT

ASME Code Case N-481, paragraph e - submittal of report

In accordance with ASME Code Case N-481, "Alternative Examination Requirements for Cast Austenitic Pump Casing," paragraph e, a report of the evaluation performed to demonstrate the safety and serviceability of the pump casing shall be submitted to the regulatory and enforcement authorities having jurisdiction at the plant site for review.

The following information is contained in Westinghouse Proprietary Class 2 report WCAP-16377-P, Revision 0, "A Demonstration of Applicability of ASME Code Case N-481 to the Primary Loop Pump Casing of the Harris Nuclear Plant (HNP) for the License Renewal Program," dated January 2005. WCAP-16377-P, Revision 0, provides an assessment of the primary loop pump casings of the HNP to the conditions of Item (d) of ASME Code Case N-481.

Since the evaluation considers actual HNP fracture toughness and yield strength values, Item (d)(1) is satisfied. Item (d)(2) is satisfied by the presentation of stress analyses of a representative primary loop pump casing in WCAP-13045. The review of the operating history of Westinghouse design primary loop pumps in Section 2 of WCAP-13045 satisfies Item (d)(3). Section 5.1 of WCAP-16377-P describes the flaws postulated in the pump casings which addresses Item (d)(4). One-quarter thickness reference flaws with a six-to-one aspect ratio are postulated per Item (d)(5).

WCAP-16377-P provides a comparison of the loads of the HNP pump casings with the screening loads of WCAP-13045. To meet Item (d)(6) requirements, the stability of the flaws postulated in the HNP primary loop pump casings are established by evaluating the resulting $J_{applied}$ and $T_{applied}$ against the fracture toughness values noted in the Item (d)(1) discussion.

The evaluation in WCAP-16377-P of the effect of thermal aging, combined with the lack of any other mechanism known to degrade the properties of the pump casings during service, satisfy Item (d)(7).

Westinghouse Proprietary Class 2 report WCAP-16377-P, Revision 0, "A Demonstration of Applicability of ASME Code Case N-481 to the Primary Loop Pump Casing of the Harris Nuclear Plant (HNP) for the License Renewal Program," dated January 2005, concludes that the primary loop pump casings of HNP are in compliance with Item (d) of ASME Code Case N-481.

Due to the proprietary nature of this report, WCAP-16377-P, Revision 0, is currently available at HNP.

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT NO. 1
DOCKET NO. 50-400/LICENSE NO. NPF-63
ADDITIONAL INFORMATION FOR SECOND INTERVAL CLOSE-OUT
RFO13

References:

1. Letter from D. H. Corlett to the Nuclear Regulatory Commission (Serial: HNP-06-081), "90-Day Inservice Inspection (ISI) Summary Report," dated August 10, 2006

2. Letter from D. H. Corlett to the Nuclear Regulatory Commission (Serial: HNP-08-017), "RFO13 90-Day Inservice Inspection (ISI) Summary Report," dated February 08, 2008

In accordance with 10 CFR 50.55a, Carolina Power and Light Company, doing business as Progress Energy Carolinas, Inc., submitted the above Refueling Outage 13 (RFO13) Inservice Inspection (ISI) Summary Report and Supplement for the Harris Nuclear Plant (HNP). HNP is providing the results of six additional examinations that were completed during RFO13 of the Second Ten-Year ISI Interval but not included in the NIS-1 Form, "Report of Inservice Inspections," of the August 10, 2006, submittal.

Visual inspection of the reactor interior:

Code Category B-N-1	II-RV-001-INTERIOR
Code Category B-N-2	II-RV-001RVCS-01 II-RV-001RVCS-02 II-RV-001RVCS-03 II-RV-001RVCS-04
Code Category B-N-3	II-RV-001CORE BARREL

No indications were found that required evaluation for continued service.

This revision is provided in accordance with 10 CFR 50.9(a), which requires information provided to the Commission by a licensee be complete and accurate in all material respects. The corrected information does not have a significant implication or public health and safety or common defense and security per 10 CFR 50.9(b).