

CATEGORY 1

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SUBJECT: Forwards "1997 Automated Inservice Exam of RPV & Adjacent Piping Welds at Shearon Harris Nuclear Plant, Unit 1," Vol 1, final rept w/appendices.Rept provides response to NRC 980413 RAI ISI program relief request submitted on 971216.

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Carolina Power & Light Company
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William R. Robinson
 Vice President
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SERIAL: HNP-98-079

JUN - 1 1998

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

SHEARON HARRIS NUCLEAR POWER PLANT
 DOCKET NO. 50-400/LICENSE NO. NPF-63
 RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
 REGARDING INSERVICE INSPECTION PROGRAM RELIEF REQUEST, REACTOR
 PRESSURE VESSEL WELDS (TAC NO. M98857)

Dear Sir or Madam:

By letter dated April 13, 1998, the NRC requested that Carolina Power & Light Company (CP&L) respond to a request for additional information regarding the Inservice Inspection Program Relief Request, Reactor Pressure Vessel Welds, which was submitted to the NRC on December 16, 1997. This letter requested that the information be provided within 60 days of receipt of the letter. CP&L received the letter on April 16, 1998.

A written report providing the requested information is provided in the enclosure to this letter. Questions regarding this matter may be referred to Mr. J. H. Eads at (919) 362-2646.

Sincerely,

AEC/aec

Enclosure

98060156

c (w/o Attachment 3): Mr. J. B. Brady (NRC Senior Resident Inspector, HNP)
 Mr. L. A. Reyes (NRC Regional Administrator, Region II)
 Mr. S. C. Flanders (NRR Project Manager, HNP)

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SHEARON HARRIS NUCLEAR POWER PLANT
DOCKET NO. 50-400/LICENSE NO. NPF-63
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
REGARDING INSERVICE INSPECTION PROGRAM RELIEF REQUEST,
REACTOR PRESSURE VESSEL WELDS (TAC NO. M98857)

Requested Information Item 1:

The licensee stated in the December 16, 1997 letter that "in accordance with 10CFR50.55a(a)(3), Carolina Power & Light Company (CP&L) hereby requests relief from the criteria of 10CFR50.55a(g)(6)(ii)(A)(2) for augmented examinations of reactor pressure vessel (RPV) welds at the Harris Nuclear Plant (HNP)." It appears that the licensee has included components in this request for relief that are not subject to the augmented examination but are subject to ASME Code requirements. Because the augmented reactor vessel examination is a Code of Federal Regulations requirement, the information submitted regarding that examination should be separate from relief requests regarding ASME Code requirements. Provide a proposed alternative to the regulatory requirements (augmented reactor pressure vessel examination) for Items B1.11 and B1.12 that provides an acceptable level of quality and safety. Provide a separate request for relief citing the applicable paragraph(s) (i.e. 10CFR50.55a(a)(3)(i) or 10CFR50.55a(a)(3)(ii), or 10CFR50.55a(g)(6)(i)) for the remaining subject welds not meeting the requirements of ASME Section XI.

Response 1:

Request for Relief Number R1-011A for the augmented examination of reactor vessel shell welds is provided in Attachment 1. Request for Relief Number R1-011B for the remaining subject welds not meeting ASME Section XI requirements is provided in Attachment 2.

Requested Information Item 2:

The licensee performed the RPV examinations in accordance with ASME Section XI, 1983 Edition with Addenda through Summer 1983. As required by 10CFR50.55a(g)(6)(ii)(A)(2), the augmented examination requirements for the reactor vessel shell welds are those specified in Table IWB-2500-1, Item B1.10 of Examination Category B-A, "Pressure Retaining Welds in Reactor Vessel," of the 1989 Edition of ASME Section XI. Verify that these augmented requirements have been met except for the welds receiving limited examination coverage listed in the request for relief.

Response 2:

According to 10CFR50.55a(g)(6)(ii)(A)(2), "The augmented examination, when not deferred in accordance with the provisions of 50.55a(g)(6)(ii)(A)(3), shall be performed in accordance with the related procedures specified in the Section XI edition and addenda applicable to the inservice inspection interval in effect on September 8, 1992, and may be used as a substitute for the reactor



vessel shell weld exam scheduled for implementation during the ISI interval in effect on September 8, 1992." The augmented examination of the reactor vessel for HNP was not deferred in accordance with the provision of 50.55a(6)(6)(ii)(A)(3), but rather was completed in May 1997, during HNP's first inspection interval. At that time, the applicable ASME Code was the 1983 Edition, with Addenda through Summer 1983. Table IWB-2500-1, Item B1.10 of Examination Category B-A, "Pressure Retaining Welds in Reactor Vessel" of the 1983 Edition of the Code required that all shell welds be examined during the first examination interval, including essentially 100% of the weld length. As a result, the augmented examination at HNP consisted of all shell welds, including essentially 100% of the weld length. This also meets the augmented examination requirements specified in Table IWB-2500-1 of the 1989 Edition of the Code. Therefore, HNP met the augmented requirements of the 1989 Edition of the Code for all shell welds, except for weld STHW-RV-04, which is the subject of Relief Request R1-011A (Attachment 1).

Requested Information Item 3:

It appears from the request for relief that the limitations associated with the subject welds are primarily due to physical obstructions and nonconductive geometry of the component surfaces. The licensee stated that these conditions prevent 100 percent examination coverage. The limitations listed in Tables 1 and 2 of the request for relief are not detailed. In some cases, identical limitations are listed for welds that have received 100% coverage (e.g., integral extension limitation on RVZOZBO-N-0-IRS). Provide more detail regarding the limitations associated with the subject welds. If available, include drawings of nonconductive geometries and physical obstructions associated with the components as well as other items that may help describe the limitations.

Response 3:

Appendix C, "Examination Coverage Report," of the "1997 Automated Inservice Examination of the Reactor Pressure Vessel and Adjacent Piping Welds at the Shearon Harris Nuclear Plant, Unit 1" report, dated June 1997, is included in Attachment 3. This report provides descriptions and figures of the limitations. Attachment 3 also includes a vessel rollout diagram and lower shell to lower head weld diagram.



REQUEST FOR RELIEF NO. R1-011A
AUGMENTED EXAMINATION OF REACTOR VESSEL SHELL WELDS

COMPONENT FOR WHICH RELIEF IS REQUESTED:

B1.11 STHW-RV-04 Lower shell to bottom head 80% Coverage Achieved

AUGMENTED EXAMINATION REQUIREMENTS:

10 CFR50.55a(g)(6)(ii)(A)(2)

AUGMENTED EXAMINATION RELIEF REQUEST:

Relief is requested from essentially 100 percent (> 90%) volumetric (UT) examination coverage due to the lower shell to bottom head weld not being 100 percent accessible over the entire length. The examination was limited because of radial support lug physical obstruction and nonconductive weld transition surface geometry.

BASIS FOR REQUESTING RELIEF:

The subject weld received limited examination coverage due to physical obstructions and nonconductive geometric surface conditions. The obstructions physically prevent 100 percent examination coverage of the subject weld volume. The nonconductive geometric surface conditions prevent sufficient sound propagation into the weld examination volume at specific locations, therefore 100 percent examination coverage is not achievable. Attempting to perform supplemental examinations from the outside surface would have required extensive surface preparation and expended unwarranted dose without a commensurate increase in the level of reliability, quality, or safety.

ALTERNATIVE EXAMINATIONS:

The Reactor Pressure Vessel (RPV) pressure retaining welds, including the lower shell to bottom head weld, are volumetrically (UT) examined to the maximum extent possible in accordance with the Inservice Inspection Program schedule. In addition, the welds are subject to visual (VT-2) pressure tests during each refueling outage.

TECHNICAL JUSTIFICATION FOR REQUESTING RELIEF:

Pressure retaining welds in the RPV, including the lower shell to bottom head weld, have been volumetrically (UT) examined to the maximum extent possible during preservice and first interval inservice examinations with no rejectable indications noted. The design configuration introduces obstructions and nonconductive surface conditions that prevent 100 percent volumetric examination coverage. The minimal number and magnitude of indications recorded during the preservice examinations and first interval inservice examinations indicate that the majority of the vessel examination volume is free of

detrimental discontinuities. Therefore, the likelihood of the limited areas not examined due to physical obstructions having a rejectable indication is minimal. The RPV examinations have been performed utilizing the state of the art examination equipment, techniques and data recording/analysis systems. Additionally, Performance Demonstration Initiative procedures, qualified personnel and techniques were utilized as a conservative measure to incorporate the current industry practice and technology.

CONCLUSION

The proposed alternative examinations provide an acceptable level of quality and safety. No impact on overall plant quality, safety or reliability is expected, since the welds have been subject to extensive construction code, preservice, and inservice examinations to the maximum extent possible. In addition, the pressure retaining welds are subject to visual (VT-2) pressure tests during refueling outages.

**REQUEST FOR RELIEF NO. R1-011B
PRESSURE RETAINING WELDS IN REACTOR VESSEL**

COMPONENTS FOR WHICH RELIEF IS REQUESTED:

B1.11	STHW-RV-04	Lower Shell to Bottom Head	(Table1)
B1.21	CHW-RV-17	Bottom Head Dome	(Table1)
B1.22	MHW-RV-16	Meridional @45°	(Table1)
B1.30	FTSW-RV-01	Flange to Upper Shell	(Table1)
B3.90	RVNOZBO-N-02	Outlet Nozzle @265°	(Table1)
B3.90	RVNOZCO-N-04	Outlet Nozzle @145°	(Table1)
B3.90	RVNOZAO-N-06	Outlet Nozzle @25°	(Table1)
B5.10	RVNOZAI-N-01-SE	Safe End to Inlet Nozzle @335°	(Table1)
B5.10	RVNOZBO-N-02-SE	Outlet Nozzle to Safe End @265°	(Table1)

ASME SECTION XI CODE REQUIREMENTS:

ASME Section XI, 1983 Edition with Addenda through Summer 1983
Examination Category B-A, Item Number B1.11, B1.21, B1.22, B1.30
Examination Category B-D, Item Number B3.90
Examination Category B-F, Item Number B5.10

CODE RELIEF REQUEST:

Relief is requested from 100 percent volumetric (UT) examination coverage due to pressure retaining welds not being 100 percent accessible over the entire length. The examinations are limited because of physical obstructions and surface geometry such as instrumentation tubes, support lugs, weld transition, integral extension and counterbore geometry.

BASIS FOR REQUESTING RELIEF:

Pursuant to 10 CFR50.55a(g)(6)(i), relief is requested on the basis that the original examination requirements have been determined to be impractical.

The subject welds received limited examination coverage due to physical obstructions and nonconductive geometric surface conditions. The obstructions physically prevent 100 percent examination coverage of the subject weld volume. The nonconductive geometric surface conditions prevent sufficient sound propagation into the weld examination volume at specific locations, therefore 100 percent examination coverage is not achievable. Attempting to perform supplemental examinations from the outside surface would have required extensive surface preparation and expended unwarranted dose without a commensurate increase in the level of reliability, quality, or safety.

ALTERNATIVE EXAMINATIONS:

The Reactor Pressure Vessel (RPV) pressure retaining welds are volumetrically (UT) examined to the maximum extent possible in accordance with the Inservice Inspection Program schedule. In addition, the welds are subject to visual (VT-2) pressure tests during each refueling outage.

TECHNICAL JUSTIFICATION FOR REQUESTING RELIEF:

Pressure retaining welds in the RPV have been volumetrically (UT) examined to the maximum extent possible during preservice and first interval inservice examinations with no rejectable indications noted. The design configuration introduces obstructions and nonconductive surface conditions that prevent 100 percent volumetric examination coverage. The minimal number and magnitude of indications recorded during the preservice examinations and first interval inservice examinations indicate that the majority of the vessel examination volume is free of detrimental discontinuities. Therefore, the likelihood of the limited areas not examined due to physical obstructions having a rejectable indication is minimal. The RPV examinations have been performed utilizing the state of the art examination equipment, techniques and data recording/analysis systems. Additionally, Performance Demonstration Initiative procedures, qualified personnel and techniques were utilized as a conservative measure to incorporate the current industry practice and technology, and penetrant examinations were performed on category B-A, Item Number B3.90 and B5.10 welds with no rejectable indications noted.

CONCLUSION

No impact on overall plant quality, safety or reliability is expected, since the welds have been subject to extensive construction code, preservice, and inservice examinations. In addition, the pressure retaining welds are subject to visual (VT-2) pressure tests during refueling outages.



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TABLE 1:
Examination Coverage Results of Harris Reactor Pressure Vessel Examinations

WELD	ITEM NO.	DESCRIPTION	COVERAGE	LIMITATION
STHW-RV-04	B1.11	Lower Shell to Bottom Head	80%	Radial Support Lugs and Weld Transition
CHW-RV-17	B1.21	Bottom Head Dome	67%	Instrumentation Tubes
MHW-RV-16	B1.22	Meridional @ 45 deg.	90%	Instrumentation Tubes
FTSW-RV-01	B1.30	Flange to Upper Shell	67%	ID Surface Taper
RVNOZBO-N-02	B3.90	Outlet Nozzle @ 265 deg.	80%	Integral Extension
RVNOZCO-N-04	B3.90	Outlet Nozzle @ 145 deg.	80%	Integral Extension
RVNOZAO-N-06	B3.90	Outlet Nozzle @ 25 deg.	80%	Integral Extension
RVNOZAI-N-01-SE	B5.10	SafeEnd to Inlet Nozzle @ 335 deg	74%	ID Surface Counterbore
RVNOZBO-N-02-SE	B5.10	Outlet Nozzle to SafeEnd @ 265 deg.	76%	ID Surface Counterbore

ATTACHMENT 3 TO SERIAL: HNP-98-079