

February 3, 2000

Mr. Harold W. Keiser
Chief Nuclear Officer & President -
Nuclear Business Unit
Public Service Electric & Gas
Company
Post Office Box 236
Hancocks Bridge, NJ 08038

SUBJECT: SAFETY EVALUATION OF RELIEF REQUESTS FOR SECOND 10-YEAR
INTERVAL FOR INSERVICE INSPECTION PROGRAM - HOPE CREEK
GENERATING STATION (TAC NO. MA2026)

Dear Mr. Keiser:

By letter dated May 11, 1998, as supplemented June 16 and October 25, 1999, Public Service Electric And Gas Company (PSE&G), submitted 10 requests for relief from the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI requirements for the Hope Creek Generating Station. These relief requests are for the second 10-year inservice inspection (ISI) interval.

The Nuclear Regulatory Commission (NRC) staff, with technical assistance from the Idaho National Engineering and Environmental Laboratory (INEEL), has reviewed and evaluated the relief requests. The staff adopts the evaluations and recommendations for granting relief or authorizing alternatives contained in the Technical Letter Report (TLR) prepared by INEEL, as reflected or as modified by the enclosed safety evaluation (SE). The INEEL TLR is provided as an Attachment to the SE. Our SE concludes the following:

- 1) With respect to Relief Request Nos. RR-A1, RR-A2, and RR-A4, the proposed alternatives provide an acceptable level of quality and safety. Therefore, the proposed alternatives are authorized pursuant to 10 CFR 50.55a(a)(3)(i).
- 2) With respect to Relief Request Nos. RR-B5 and RR-C2, compliance with the Code requirements would result in hardship without a compensating increase in the level of quality and safety. Therefore, the proposed alternatives are authorized pursuant to 10 CFR 50.55a(a)(3)(ii).
- 3) With respect to Relief Request No. RR-B1 (Parts A, B, C, D, E, F), and Relief Request No. RR-C1 (Parts A, B, and C), the Code requirements are impractical. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) provided that for Relief Request No. RR-B1, Part E, the licensee substitutes other accessible Category B-J, Item B9.21 welds for Welds 12B, 12C, and 12D. The relief granted is authorized by law and will not endanger life or property, or the common defense and security, and is otherwise in the public interest. In making this determination, the staff has considered the burden upon the licensee that could result if the requirements were imposed on the facility.

H. Keiser

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- 4) Relief Requests Nos. RR-A3, RR-B3, and RR-C3 were withdrawn by PSE&G's submittal dated October 25, 1999.

If you have any questions regarding this matter, please contact the Hope Creek Project Manager, Richard B. Ennis, at (301) 415-1420.

Sincerely,

/RA/

James W. Clifford, Chief, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-354

Enclosure: Safety Evaluation

cc w/encl: See next page

H. Keiser

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO REQUESTS FOR RELIEF ON THE

SECOND 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM

PUBLIC SERVICE ELECTRIC & GAS COMPANY

HOPE CREEK GENERATING STATION

DOCKET NO. 50-354

1.0 INTRODUCTION

The inservice inspection (ISI) of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall be performed in accordance with Section XI, "Rules for In-service Inspection of Nuclear Power Plant Components," of the ASME Boiler and Pressure Vessel Code (ASME Code) and applicable addenda as required by Title 10 of the Code of Federal Regulations (10 CFR) Section 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). Section 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) must meet the requirements, except the design and access provisions and the pre-service examination requirements, set forth in the ASME Code, Section XI, to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulation requires that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable edition of Section XI of the ASME Code for the second 10-year ISI interval for Hope Creek Generating Station (HCGS), is the 1989 Edition.

Pursuant to 10 CFR 50.55a(g)(5), if the licensee determines that conformance with an examination requirement of Section XI of the ASME Code is not practical for its facility, information will be submitted to the Commission in support of that determination and a request must be made for relief from the ASME Code requirement. After evaluation of the determination, pursuant to 10 CFR 50.55a(g)(6)(i), the Commission may grant relief and/or may impose alternative requirements that are determined to be authorized by law, will not endanger life, property, or the common defense and security, and are otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed.

ENCLOSURE

By letter dated May 11, 1998, as supplemented June 16 and October 25, 1999, Public Service Electric And Gas Company (PSE&G or the licensee), submitted 10 requests for relief from the ASME Code, Section XI requirements for HCGS. These relief requests are for the second 10-year ISI interval.

The NRC staff, with technical assistance from the Idaho National Engineering and Environmental Laboratory (INEEL), has reviewed and evaluated the relief requests. The staff adopts the evaluations and recommendations for granting relief or authorizing alternatives contained in the Technical Letter Report (TLR) prepared by INEEL, as reflected or as modified by this safety evaluation (SE). The INEEL TLR is provided as an Attachment to this SE. The staff's evaluation of the licensee's relief requests for the second 10-year ISI interval is provided below.

2.0 EVALUATION

2.1 Relief Request No. RR-A1

Relief Request No. RR-A1 was not evaluated by INEEL. The NRC staff evaluation is as follows:

In PSE&G's letter dated May 11, 1998, the licensee requested relief from the requirements of ASME Code Section XI, 1989 Edition, Article IWF-5000, with regard to visual examination and functional testing of hydraulic and mechanical snubbers. Article IWF-5000 references the first addenda to ASME/ANSI OM-1987, Part 4 (OMa-4) for such snubber activities. The licensee requested the use of the Technical Specifications (TSs), instead of ASME Code Section XI, for the required snubber visual examination and functional testing, pursuant to 10 CFR 50.55a(a)(3)(i). In response to the staff's request during a teleconference with the licensee on April 22, 1999, the licensee submitted a letter on June 16, 1999, which provides changes to the original relief request dated May 11, 1998. The original relief request was revised to specifically state that the snubber VT-3 visual examinations will be conducted in accordance with ASME Code Section XI, Paragraph IWA-2213 and that snubber repairs or replacements will also be performed in accordance with the plant ASME Section XI program.

In the letter dated June 16, 1999, the licensee stated that the HCGS TSs contain specifically developed and approved visual examination scheduling and functional testing requirements. The licensee further stated that performance of examinations and testing to the requirements of the TSs meet some of the ASME Code requirements. Where the TS approach differs in the areas of examination scheduling, re-examinations and functional testing requirements, the licensee stated that visual examination and testing to the TS results in an increase in the overall level of plant quality and safety.

The above-mentioned first addenda to ASME/ANSI OM-1987, Part 4 (OMa-4), contains a visual examination schedule which was recommended for removal from plant TSs by Generic Letter (GL) 90-09, "Alternative Requirements for Snubber Visual Inspection Intervals and Corrective Actions," dated December 11, 1990. This GL was issued to reduce the burden placed upon utilities by the then overly restrictive visual examination schedule. The HCGS TSs incorporated the recommendations of GL 90-09.

HCGS TS 3/4.7.5 specifies that one of three methods shall be used for snubber functional test:

1. Functionally test 10% of a type of snubber with an additional 10% tested for each functional testing failure, or
2. Functionally test a sample size and determine sample acceptance or rejection using TS Figure 4.7.5-1, or
3. Functionally test a representative sample size and determine sample acceptance or rejection using the equation, $N = 55 (1 + C/2)$, where "C" is the number of snubbers found that do not meet the functional test acceptance criteria and "N" is the total number of snubbers tested.

ASME/ANSI OMa-4 specifies two functional test plans, similar to methods (1) and (3) above. For the 10% plan, however, it requests that an additional 5% of snubbers be tested for each functional test failure. For the test plan that is similar to method (3), it specifies an initial sample of 35, as compared to the 55 specified by the TS. Therefore, the staff concludes that the HCGS sample requirements as stipulated in TS 3/4.7.5 are more conservative than those specified in ASME/ANSI OM-4.

The licensee stated in the letter dated June 16, 1999, that, in lieu of using Article IWF-5000 (which references OMa-4), the ongoing examination and testing program, in accordance with TS requirements (which incorporate the visual examination schedule of GL 90-09), is designed to demonstrate the functional integrity of the snubbers and is at least equivalent to the requirements of Article IWF-5000.

The licensee stated that, according to the TS requirements, the initial test sample shall be 10% or 55 for each design type population, and the sample expansion shall be based on an additional 10% of the population (for 10% plan). In addition, according to the TSs, the service life of a snubber is evaluated via manufacturer input and information through consideration of a snubber's service conditions and its associated installation and maintenance records (i.e., newly installed snubber, seal replaced, spring replaced, in high radiation area, in high temperature area, etc.). The requirement to monitor the snubber service life is included in the snubber surveillance program to ensure that the snubbers periodically undergo a performance evaluation in view of their age and operation conditions. These records will provide the statistical bases for future consideration of snubber service life.

The staff finds the alternative program as provided in the TSs to be acceptable.

The licensee stated in the letter dated June 16, 1999, that the snubber visual examination will be conducted using the VT-3 examination method of ASME Section XI. In addition, the licensee clarifies that the repair and replacement of the HCGS snubbers shall be performed in accordance with the requirements of ASME Section XI, IWA-4000. This is acceptable to the staff.

Based on the information provided by the licensee and the above evaluation, the staff has determined that the licensee has presented an adequate justification for relief from the requirements of ASME Code 1989 Edition, Section XI, Article IWF-500 (which references OMA-4), with regard to visual examination and functional testing of the HCGS snubbers. The staff has determined that the proposed alternative use of the HCGS TSs for snubber activities would provide an acceptable level of quality and safety. Therefore, Relief Request No. RR-A1 is authorized pursuant to 10 CFR 50.55a(a)(3)(i).

2.2 Relief Request No. RR-A2

ASME Code, Section XI, requires examination of integrally welded attachments as specified for Examination Categories B-K-1, C-C, D-A, D-B, and D-C. The Code stipulates volumetric or surface examinations, as appropriate, and the extent of examinations.

Pursuant to 10 CFR 50.55a(a)(3)(i), the licensee proposed to perform examinations in accordance with Code Case N-509, *Alternate Rules for the Selection and Examination of Class 1, 2, and 3 Integrally Welded Attachments, Section XI, Division 1*, and to additionally include a minimum 10% sample of integrally welded attachments for each item in each code class per interval, in lieu of the requirements of the Code for Class 1, 2, and 3 integrally-welded attachments.

The NRC staff has reviewed Code Case N-509 and has found the Code Case acceptable for use subject to the condition (in addition to those specified in the Code Case) to examine a minimum 10% sample of integrally welded attachments for each item in each code class per interval, as stated in Regulatory Guide 1.147, *Inservice Inspection Code Case Acceptability*, Revision 12, (May 1999). Since the licensee committed to implement the condition on Code Case N-509 that is specified in Regulatory Guide 1.147, Revision 12, the proposed alternative provides an acceptable level of quality and safety. Therefore, the proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i).

2.3 Relief Request No. RR-A3

This relief request was withdrawn in PSE&G's submittal dated October 25, 1999.

2.4 Relief Request No. RR-A4

ASME Code, Section XI, IWA-5250(a)(2) requires that if leakage occurs at a bolted connection in Class 1, 2, or 3 components, the bolting shall be removed, VT-3 examined for corrosion, and evaluated in accordance with IWA-3100.

Pursuant to 10 CFR 50.55a(a)(3)(i), the licensee proposed to use paragraph IWA-5250(a)(2) of the 1990 Addenda of Section XI of the ASME Code.

IWA-5250(a)(2) in the 1990 Addenda requires that if leakage occurs at a bolted connection, only one of the bolts need be removed, VT-3 examined, and evaluated in accordance with IWA-3000. The bolt selected shall be the one closest to the source of leakage. When the removed bolt has evidence of degradation, all remaining bolting in the connection shall be removed, VT-3

examined, and evaluated in accordance IWA-3100. The licensee has enhanced this requirement and will perform a VT-1 examination in lieu of VT-3, because the Code does not provide acceptance criteria for the required VT-3 examination of bolting, whereas acceptance criteria for VT-1 examination are provided.

The staff has reviewed the 1990 Addenda of Section XI of the ASME Code and has found it acceptable for general use by incorporating it into 10 CFR Part 50 by a final rule dated September 22, 1999. The staff concludes that the use of IWA-5250(a)(2) as written in the 1990 Addenda with the modification to use VT-1 in lieu of VT-3 provides an acceptable level of quality and safety. The licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i).

2.5 Relief Request No. RR-B1

RR-B1, Part A

ASME Code, Section XI, Examination Category B-A, Item B1.30 requires a 100% volumetric examination of the reactor pressure vessel (RPV) shell-to-flange weld as defined by Figure IWB-2500-4. Item B1.12, Footnote 2, requires volumetric examination of essentially 100% of the length of RPV longitudinal shell welds, as defined by Figure IWB-2500-2. Item B1.22 requires volumetric examination of essentially 100% of the accessible length of RPV meridional head welds, as defined by Figure IWB-2500-3.

Pursuant to 10 CFR 50.55a(g)(5)(iii) the licensee has requested relief from performing volumetric examinations to the extent required by the Code for the inaccessible portions of the Category B-A weld examination areas identified in the table listed in Section F of the contractor's TLR.

Complete volumetric examination is limited by physical obstructions, such as the proximity of the weld area to the vessel support skirt, nozzles, weldments, or welded thermocouple pads that obstruct access to the examination area and make the Code coverage requirements impractical for these welds. To complete the examinations to the extent required by the Code, the licensee would have to redesign and modify the reactor pressure vessel. Imposition of the Code requirements would result in a significant burden on the licensee.

The licensee can perform approximately 49% of the cumulative Code-required examination for Weld RPV1-W3 and >78% for the remaining welds. The examinations performed provide reasonable assurance of the structural integrity of these longitudinal shell, meridional head, and shell-to-flange pressure-retaining welds. Relief is granted pursuant to 10 CFR 50.55a(g)(6)(i).

RR-B1, Part B

ASME Code, Section XI, Examination Category B-D, Item B3.90 requires a volumetric examination of reactor pressure vessel (RPV) nozzle-to-vessel welds as defined by Figure IWB-2500-7(a) and (b). The examination volume includes 100% of the weld length.

Pursuant to 10 CFR 50.55a(g)(5)(iii) the licensee has requested relief from performing volumetric examinations to the extent required by the Code for the inaccessible portions of the

RPV nozzle-to-vessel welds identified in the table in Section G of the contractor's TLR.

The examinations are impractical to perform to the extent required by the Code since the licensee would have to redesign and modify the nozzles and/or reactor pressure vessel. Imposition of the Code requirements would be a significant burden on the licensee.

The licensee can examine a significant portion (71%) of the cumulative Code-required volume for these welds. Therefore, the examinations performed provide a reasonable assurance of structural integrity of the nozzle-to-vessel pressure retaining welds. Relief is granted pursuant to 10 CFR 50.55a(g)(6)(i).

RR-B1 Part C

ASME Code, Section XI, Examination Category B-H, Item B8.10 requires 100% volumetric or surface examination of RPV integrally welded attachments as described in applicable Figures IWB-2500-13, -14, and -15, each inspection interval.

Pursuant to 10 CFR 50.55a(g)(5)(iii) the licensee has requested relief from performing volumetric or surface examinations to the extent required by the Code for the inaccessible portions of attachment Weld RPV1-WSB(1-8) as identified in the table in section H of the contractor's TLR.

Complete surface or volumetric examination is limited by permanently installed insulation support brackets that obstruct access to the examination area. The Code examination requirements are impractical for these integrally welded attachments. To complete the examinations to the extent required by the Code, the licensee would have to redesign and modify the insulation support brackets on the RPV. Imposition of the Code requirements would be a significant burden on the licensee.

The licensee examined the subject integrally welded attachments to the extent practical. The examinations that can be completed provide reasonable assurance of structural integrity of these integrally welded attachments. Relief is granted pursuant to 10 CFR 50.55a(g)(6)(i).

RR-B1, Part D

ASME Code, Section XI, Examination Category B-J, Items B9.11 and B9.12 require 100% surface and volumetric examination of circumferential and longitudinal welds in pressure-retaining piping NPS 4 or larger, as defined by Figure IWB-2500-8, each inspection interval.

Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee has requested relief from performing surface and volumetric examinations to the extent required by the Code for the welds identified in Section I of the contractor's TLR.

The extent of the surface and volumetric examinations of circumferential Welds 4 and 2LD are limited by interference from pipe supports and banding that obstruct access to the examination areas. The extent of surface examinations of Welds 5, 6, 7, and 8 is limited by a box support pad, pipe restraint, instrumentation bracket, banding, and a component support. The Code volumetric and/or surface coverage requirements are impractical for these welds. To complete the examinations to the extent required by the Code the licensee would have to redesign and modify the subject piping and/or piping supports. Imposition of the Code coverage requirements would be a significant burden on the licensee.

The licensee can perform 70%-89% of the cumulative Code-required surface examination, and 83.3%-100% of the Code-required volumetric examination. The examinations performed provide reasonable assurance of the structural integrity of the circumferential welds. Relief is granted pursuant to 10 CFR 50.55a(g)(6)(i).

RR-B1, Part E

ASME Code, Section XI, Examination Category B-J, Item B9.21 requires 100% surface examination of circumferential welds in pressure-retaining piping less than NPS 4, as defined by Figure IWB-2500-8, each inspection interval.

Pursuant to 10 CFR 50.55a(g)(5)(iii) the licensee requested relief from performing surface examinations to the extent required by the Code for the welds identified in Section J of the contractor's TLR.

The surface examinations of Welds 1, 3, and 7 are limited by interference from a permanent wall and the surface examinations for Welds 12B, 12C, and 12D are limited because these welds are enclosed within penetrations. The Code's surface examination requirements are impractical for the subject welds. To complete the examinations to the extent required by the Code, the licensee would have to redesign and modify the subject piping and/or existing wall penetrations causing a significant burden on the licensee.

For Welds 1, 3, and 7, the licensee can examine 46%, 45%, and 60% respectively, of the required surface coverage. No examinations were performed on Welds 12B, 12C, and 12D. However, information in the licensee's Inservice Inspection Program suggests that as an alternative it may be possible to substitute other Code Category B-J, Item B9.21, welds for those that are inaccessible. The exams performed, along with the alternate surface exams, and the Code required VT-2 visual exams during system leakage tests would provide reasonable assurance of the continued structural integrity of the subject welds. Relief is granted pursuant to 10 CFR 50.55a(g)(6)(i), provided that the licensee substitutes other accessible Category B-J, Item 9.21, welds for Welds 12B, 12C, and 12D.

RR-B1, Part F

ASME Code, Section XI, Examination Category B-J, Item B9.31 requires 100% surface and volumetric examination of branch pipe connection welds in pressure-retaining piping NPS 4 or larger, as defined by Figures IWB-2500-9, -10, and -11 each inspection interval.

Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee has requested relief from performing volumetric examinations to the extent required by the Code for the welds identified in Section K of the contractor's TLR.

The volumetric examinations of Item B9.31 branch pipe connection Welds 6BC1 and 3BC1 are limited by permanently installed pipe whip restraints that limit access to the examination area and the Code volumetric examination requirements are impractical for these welds. To gain access for examination of these welds, these restraints would have to be removed and reinstalled, or permanently redesigned and modified. Imposition of the Code requirements for these welds would be a significant burden on the licensee.

The licensee can examine a significant portion of the required volume, 82% and 85%, for Welds 6BC1 and 3BC1, respectively. The licensee also can examine 100% of the required surface examination for these welds. These examinations will provide reasonable assurance of structural integrity of the subject branch pipe connections. Relief is granted pursuant to 10 CFR 50.55a(g)(6)(i).

2.6 Relief Request No. RR-B3

This relief request was withdrawn in PSE&G's submittal dated October 25, 1999.

2.7 Relief Request No. RR-B5

In accordance with 10 CFR 50.55a(g)(6)(ii)(A), all licensees must implement once, as part of the inservice inspection interval in effect on September 8, 1992, an augmented examination of the reactor pressure vessel (RPV) welds specified in Item B1.10 of Examination Category B-A of the 1989 Edition of the ASME Code, Section XI. Examination Category B-A, Items B1.11 and B1.12 require volumetric examination of essentially 100% of the length of RPV circumferential and longitudinal shell welds, as defined by Figures IWB-2500-1 and -2, respectively. In addition, 10 CFR 50.55a(g)(6)(ii)(A)(2) further defines *essentially 100%* as being greater than 90% of the examination volume of each weld.

Pursuant to 10 CFR 50.55a(a)(3)(ii), the licensee has proposed an alternative to the augmented RPV examination coverage requirements because essentially 100% coverage could not be achieved for the welds listed in Section E of the contractor's TLR.

The augmented coverage requirements could not be met by the licensee for three shell welds due to the proximity to nozzles, brackets, and insulation pads. For B.12 welds RPV1-W12-2, RPV1-W12-3, and RPV1-W13-2 the physical obstructions limited coverage to 79%, 78.7%, and 89%, of the required volume, respectively. To achieve complete coverage for the subject welds, design modifications of the vessel-to-nozzle configurations would be required to increase access.

As a result of the augmented volumetric examination rule, licensees must make a reasonable effort to maximize examination coverage of their reactor vessels. In cases where examination coverage from the inside surface (ID) is inadequate, examination from the outside surface (OD) using manual inspection techniques may be an option. The licensee performed the augmented

examination with the General Electric GERIS 2000 inspection tool from inside the vessel. In addition, the licensee supplemented the automated examinations with manual examinations from the OD to achieve the percentages of coverage identified.

The licensee has examined a significant portion of the three B.12 welds and has met the coverage requirements for the remaining B1.12 RPV shell welds.

Based on the volumetric examination coverages attained, and the full examinations conducted on other B1.10 RPV welds, the staff concludes that the examinations performed provide reasonable assurance of structural integrity of the subject welds. To require the licensee to modify the nozzle-to-shell configurations solely for increasing volumetric coverage would present a considerable hardship without a compensating increase in the level of quality and safety. The licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

2.8 Relief Request No. RR-C1

RR-C1, Part A

ASME Code, Section XI, Examination Category C-A, Item Number C1.10 requires a volumetric examination of the Residual Heat Removal Heat Exchanger shell-to-flange weld as defined by Figure IWC-2500-1. The examination coverage shall include essentially 100% of the weld length.

Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from performing volumetric examinations to the extent required by the Code for the inaccessible portions of the Class 2, Category C-A, weld identified in Section M of the contractor's TLR.

The extent of volumetric examination for the subject component is limited by interference from the flange studs that obstruct access to the examination area. The Code examination requirement is impractical. To increase examination coverage, the component would have to be redesigned, modified, or disassembled. Imposition of the Code requirement would be a significant burden on the licensee.

The licensee can examine a significant amount (88.6%) of the Code-required volume for Weld RHX-W4. The subject examinations provide reasonable assurance of structural integrity of the pressure-retaining circumferential shell welds. Relief is granted pursuant to 10 CFR 50.55a(g)(6)(i).

RR-C1, Part B

ASME Code, Section XI, Examination Category C-B, Item C2.21 requires 100% volumetric and surface examination as defined by figure IWC-2500-4(a) or (b) for Class 2 Nozzle-to-Shell welds. Item C2.22 requires 100% volumetric examination as defined by Figure IWC-2500-4(c) of Nozzle Inside Radius Sections.

Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee has requested relief from performing volumetric examinations to the extent required by the Code for the inaccessible portions of the

Class 2, Category C-B, weld examinations identified in Section N of the contractor's TLR.

Complete volumetric examination of Welds RHX-W6 and RHX-IR2 is limited due to the nozzle configuration and the nozzle inner bend radius. The Code requirements are impractical for these welds. To obtain increased examination coverage, the vessel and/or nozzles would have to be redesigned and modified. Imposition of the Code requirements would result in a significant burden on the licensee.

The licensee can complete 89% of the Code-required volumetric examinations for Weld RHX-W6 and 26.4% of the volumetric examination for Weld RHX-IR2. The licensee has also performed the Code-required surface examinations of these welds. These examinations provide reasonable assurance of the structural integrity of the nozzle. Relief is granted pursuant to 10 CFR 50.55a(g)(6)(i).

RR-C1, Part C

ASME Code, Section XI, Examination Category C-G, Item C6.10 requires 100% surface examination of Class 2 pressure-retaining pump casing welds, as defined by Figure IWC-2500-8, each inspection interval.

Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee has requested relief from performing surface examinations to the extent required by the Code for the Class 2, Category C-G welds identified in Section O of the contractor's TLR.

The subject pump casing welds are partially encased in concrete, inaccessible due to the design of the pump pedestal, or inaccessible due to flange bolting interference. These limitations preclude complete surface examination. These surface examinations are impractical to perform to the extent required by the Code. To perform the Code-required examination, the pumps and/or their surrounding support structure would have to be redesigned, modified, or disassembled. Imposition of this requirement would be a significant burden on the licensee.

The licensee can examine 18%, 23%, and 73% of Welds RHP-W2, RHP-W3, CSP-W2 respectively; Welds CSP-W1, CSP-W5, and RHP-W1 are impractical to examine. The licensee has proposed to examine Weld CSP-W5 when the pump is disassembled for maintenance. The licensee's proposed examinations provide reasonable assurance of the structural integrity of the subject pump casing welds. Relief is granted pursuant to 10 CFR 50.55a(g)(6)(i).

2.9 Relief Request No. RR-C2

Code Case N-498-1 allows a system pressure test to be performed at nominal operating pressure on Class 1, 2, and 3 components as an alternative to the 10-year system hydrostatic test required by Categories C-H, D-A, D-B, and D-C. The system pressure test alternative provided by the Code Case requires a 4-hour hold time at nominal operating pressure before performing the required visual examination for components that are insulated.

Pursuant to 10 CFR 50.55a(a)(3)(ii), the licensee proposed to perform the alternative system

pressure test (as required by N-498-1) using a 20-minute hold time for insulated portions of High Pressure Coolant Injection (HPCI) pump discharge piping, HPCI turbine steam supply and exhaust lines, and associated drains and vents, in lieu of the required 4-hour hold time.

Examination Category C-H for Class 2 systems and Categories D-A, D-B, and D-C for Class 3 systems require a system hydrostatic test each inspection interval. By safety evaluation dated March 17, 1995, the licensee obtained approval to use Code Case N-498-1, *Alternative Rules for 10-Year System Hydrostatic Testing for Class 1, 2, and 3 Systems*. The alternative system pressure test allowed by Code Case N-498-1 requires a 4-hour hold time for systems that are insulated. The intent of the 4-hour hold time for insulated components is to allow leakage to penetrate the insulation prior to visual examination. The licensee contends that a 4-hour hold time for the portions of the subject insulated systems creates an undue hardship without a compensating increase in the level of quality and safety.

For the licensee to maintain a 4-hour hold time, operation of the HPCI pump would be required. Operation of the HPCI pump for this length of time would subject the plant to excessive heat loads. To control the heat loads, operation of the ECCS subsystems to remove heat from the suppression pool would also be required. Prolonged operation of the HPCI pump would challenge the TS limitation on maximum suppression pool water temperature. If the maximum suppression pool water temperature is exceeded, plant TSs require the reactor mode to be placed in a shutdown condition. Removing the insulation for the purpose of utilizing the 20-minute hold time would result in excessive radiation exposure to plant personnel, which would cause hardship without a compensating increase in safety.

When the system is in standby condition during normal plant operation, the HPCI pump discharge line is maintained above atmospheric pressure by operation of the HPCI jockey pump. This pressure is less than the nominal operating pressure required by Code Case N-498-1. However, a 20-minute hold time at nominal operating pressure in conjunction with the continuous hold time at the lower pressure provided by the jockey pump provides reasonable assurance that if leakage occurs, it will permeate through the insulation.

The licensee's proposed alternative provides reasonable assurance of structural integrity of the affected systems, and that imposing the requirements of the Code Case on limited portions of the subject insulated systems would cause an undue burden without a compensating increase in the level of quality and safety. The licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

2.10 Relief Request No. RR-C3

This relief request was withdrawn in PSE&G's submittal dated October 25, 1999.

3.0 CONCLUSION

With respect to Relief Request Nos. RR-A1, RR-A2, and RR-A4, the proposed alternatives provide an acceptable level of quality and safety. Therefore, the proposed alternatives are authorized pursuant to 10 CFR 50.55a(a)(3)(i).

With respect to Relief Request Nos. RR-B5 and RR-C2, compliance with the Code requirements would result in hardship without a compensating increase in the level of quality and safety. Therefore, the proposed alternatives are authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

With respect to Relief Request No. RR-B1 (Parts A, B, C, D, E, F), and Relief Request No. RR-C1 (Parts A, B, and C), the Code requirements are impractical. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) provided that for Relief Request No. RR-B1, Part E, the licensee substitutes other accessible Category B-J, Item B9.21 welds for Welds 12B, 12C, and 12D. The relief granted is authorized by law and will not endanger life or property, or the common defense and security, and is otherwise in the public interest. In making this determination, the staff has considered the burden upon the licensee that could result if the requirements were imposed on the facility.

Relief Requests Nos. RR-A3, RR-B3, and RR-C3 were withdrawn by PSE&G's submittal dated October 25, 1999

Principal Contributors: T. K. McLellan
A. J. Lee

Date: February 3, 2000

Attachment: Technical Letter Report

TECHNICAL LETTER REPORT
ON THE SECOND 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM
REQUESTS FOR RELIEF
FOR
PUBLIC SERVICE ELECTRIC AND GAS COMPANY OF NEW JERSEY
HOPE CREEK GENERATING STATION, UNIT 1
DOCKET NUMBER: 50-354

1. INTRODUCTION

By letter dated May 11, 1998, the licensee, Public Service Electric and Gas Company of New Jersey, submitted their second interval 10-year inservice inspection (ISI) program, including requests for relief from the requirements of the ASME Code, Section XI, for the Hope Creek Generating Station, Unit 1. In a "Response to Request For Additional Information" letter dated October 25, 1999, the licensee withdrew Relief Requests RR-A3, RR-B3, and RR-C3. In addition, the licensee submitted new Relief Request RR-B5 and a revision of RR-A4. The Idaho National Engineering and Environmental Laboratory (INEEL) staff's evaluation of the subject requests for relief is in the following section.

2. EVALUATION

The information provided by Public Service Electric and Gas Company (PSE&G) of New Jersey in support of the requests for relief from Code requirements has been evaluated and the bases for disposition are documented below. The Code of record for the Hope Creek Generating Station, second 10-year ISI interval, which began December 13, 1997, is the 1989 Edition of Section XI of the ASME Boiler and Pressure Vessel Code.

A. Request for Relief RR-A1, IWF-5000, Inservice Inspection Requirements For Class 1, 2, and 3 Mechanical and Hydraulic Snubbers

Request for Relief RR-A1 is part of the Inservice Test (IST) Program and is, therefore, not included in this evaluation. This request for relief will be evaluated by the Mechanical Engineering Branch of the NRC.

B. Request for Relief RR-A2, Use of Code Case N-509, *Alternate Rules for the Selection and Examination of Class 1, 2, and 3 Integrally Welded Attachments, Section XI, Division 1*

Code Requirement: The Code requires examination of integrally-welded attachments as specified for Examination Categories B-K-1, C-C, D-A, D-B, and D-C. The Code stipulates volumetric or surface examinations, as appropriate, and the extent of examinations.

Licensee's Proposed Alternative: In accordance with 10 CFR 50.55a(a)(3)(i), the licensee proposed to use Code Case N-509, *Alternate Rules for the Selection and Examination of Class 1, 2, and 3 Integrally Welded Attachments, Section XI, Division 1*, in lieu of the requirements of the Code for Class 1, 2, and 3 integrally-welded attachments. The licensee stated:

"Perform examinations in accordance with Code Case N-509, and to include a minimum 10% sample of integrally welded attachments for each item in each code class per interval."

Licensee's Basis for Proposed Alternative (as stated):

"Pursuant to 10CFR50.55a(a)(3)(i), relief is requested from performing the inservice examination of integral attachments in accordance with Exam Categories

B-K-1, C-C, D-A, D-B & D-C.

“This Code Case received extensive consideration by the ASME Code Committee, and was provided in the interest of optimization of inservice inspection examinations. While implementation of the governing Code requirements in this area does not represent significant hardship, the extent of examinations prescribed far exceeded the levels necessary to support continued plant quality and safety.

“Also, the Draft Regulatory Guide DG-1050 (Revision 12 to Regulatory Guide 1.147) incorporates Code Case N-509 into the Regulatory Guide with the following stipulation:

“Code Case N-509 is acceptable subject to the following condition in addition to those conditions specified in the Code Case: A minimum 10% sample of integrally welded attachments for each item in each code class per interval should be examined.”

Evaluation: The Code requires examination of integrally-welded attachments as specified for Examination Categories B-K-1, C-C, D-A, D-B, and D-C. The Code stipulates volumetric or surface examinations, as appropriate, and the extent of examinations. As an alternative, the licensee proposed to implement the requirements of Code Case N-509, *Alternate Rules for the Selection and Examination of Class 1, 2, and 3 Integrally Welded Attachments, Section XI, Division 1*, in lieu of the requirements of the Code for Class 1, 2, and 3 integrally-welded attachments.

The NRC staff has reviewed Code Case N-509 and has found the Code Case acceptable for general use as evidenced by incorporation into Regulatory Guide 1.147, *Inservice Inspection Code Case Acceptability*, Revision 12, (May 1999). Therefore, the use of this Code Case with the conditions specified in the Regulatory Guide is considered acceptable for use at Hope Creek Nuclear Generating Station, Unit 1.

C. Request for Relief RR-A3, Paragraphs IWB-2412(a), IWC-2412(a), IWD-2412(a), Inspection Program B Requirements

Note: In response to the NRC request for additional information (RAI), Request for Relief RR-A3 was withdrawn by the licensee in the letter dated October 25, 1999.

D. Request for Relief RR-A4 (Revision 0, Change 2), IWA-5250(a)(2), Corrective Actions for Bolted Connections

Code Requirement: Section XI, IWA-5250(a)(2) requires that if leakage occurs at a bolted connection in Class 1, 2, or 3 components, the bolting shall be removed, VT-3 examined for corrosion, and evaluated in accordance with IWA-3100.

Licensee's Proposed Alternative: In accordance with 10 CR 50.55a(a)(3)(i), the licensee proposed to use paragraph IWA-5250(a)(2) of the 1990 Addenda of Section XI of the ASME

Boiler and Pressure Vessel Code. The licensee stated:

“Adopt paragraph IWA-5250(a)(2), of the Addenda through 1990 ASME Section XI as modified in this request.”

Licensee’s Basis for Proposed Alternative (as stated):

“Pursuant to 10CFR50.55a(a)(3)(i), relief is requested to adopt paragraph IWA-5250(a)(2), of the Addenda through 1990 ASME Section XI with modifications included to address NRC concerns.

“The proposed alternative requirement is included in a published revision of ASME Section XI as a corrective measure for leakage at a bolted connection. The modified requirement is as follows: ‘If leakage occurs at a bolted connection, one of the bolts shall be removed, VT-1 examined, and evaluated in accordance with IWB-3000. The bolt selected shall be the one closest to the source of leakage. When the removed bolt has evidence of degradation, all remaining bolting in the connection shall be removed, VT-1 examined and evaluated in accordance with IWB-3000.’

“The objective of the original and revised Code requirement is to detect degradation of the fastener that has resulted in leakage of the joint. The Code is not attempting to address component alignment or gasket problems associated with a leaking flanged connection. The examination method is VT-1, which is conducted to determine the condition of the part, component, or surface examined, including such conditions as cracks, wear, corrosion, erosion, or physical damage on the surfaces of the part or components.

“The ASME council decided in the 1990 Addenda to accept a sample of bolts, with the provision for sample expansion, instead of visual examination of all bolts after the detection of leakage. The current revision of the Code was published after due consideration of the acceptance standards for the number of degraded bolts that could be present before significant safety problems would exist.

“Based on the information identified above, a conclusion has been reached that requirements published in Paragraph IWA-5250(a)(2) in the 1990 Addenda of ASME Section XI as modified in this relief request would be capable of detecting a significant safety problem and, therefore, provide an acceptable level of quality and safety pursuant to 10CFR50.55a(a)(3)(i).”

Evaluation: In accordance with IWA-5250(a)(2), if leakage occurs at a bolted connection, the bolting must be removed, VT-3 visually examined for corrosion, and evaluated in accordance with IWA-3100. In lieu of this requirement, the licensee has proposed to adopt paragraph IWA-5250(a)(2) of the 1990 Addenda of Section XI of the ASME Boiler and Pressure Vessel Code.

IWA-5250(a)(2) in the 1990 Addenda requires that if leakage occurs at a bolted connection, only one of the bolts need be removed, VT-3 examined, and evaluated in accordance with IWA-3000. The bolt selected shall be the one closest to the source of leakage. When the removed bolt has evidence of degradation, all remaining bolting in the connection shall be removed, VT-3 examined, and evaluated in accordance IWA-3100. The licensee has enhanced this requirement and will perform a VT-1 examination in lieu of VT-3. Because the Code does not provide an acceptance criteria for the required VT-3 examination of bolting, whereas an acceptance criteria for VT-1 examination is provided.

The NRC staff has reviewed the 1990 Addenda of ASME Section XI and has found it acceptable for general use as evidenced by incorporation into Federal Register Part II, Nuclear Regulatory Commission, 10CFR Part 50, Industry Codes and Standards; Amended Requirements; Final Rule dated September 22, 1999. The INEEL staff concludes that the use of IWA-5250(a)(2) as written in the 1990 Addenda with the modification to use VT-1 in lieu of VT-3 will provide an acceptable level of quality and safety and is considered acceptable for use at Hope Creek Nuclear Generating Station, Unit 1. Therefore, it is recommended that the licensee's proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(i).

E. Request for Relief RR-B5, Alternative to 10 CFR 50.55a(g)(6)(ii)(A), Augmented Reactor Pressure Vessel Examination

Regulatory Requirement: In accordance with 10 CFR 50.55a(g)(6)(ii)(A), all licensees must implement once, as part of the inservice inspection interval in effect on September 8, 1992, an augmented examination of the reactor pressure vessel (RPV) welds specified in Item B1.10 of Examination Category B-A of the 1989 Edition of the ASME Code, Section XI. Examination Category B-A, Items B1.11 and B1.12 require volumetric examination of essentially 100% of the length of RPV circumferential and longitudinal shell welds, as defined by Figures IWB-2500-1 and -2, respectively. In addition, 10 CFR 50.55a(g)(6)(ii)(A)(2) further defines *essentially 100%* as being greater than 90% of the examination volume of each weld.

Licensee's Proposed Alternative: In accordance with 10 CFR 50.55a(a)(3)(ii), the licensee has proposed an alternative to the augmented RPV examination coverage requirements because essentially 100% coverage could not be achieved for the following welds.

Component ID	Item #	% of Code	Limitation
RPV1-W12-2	B1.12	79	Proximity of the N5B Nozzle
RPV1-W12-3	B1.12	78.7	Proximity of a vessel stabilizer bracket and the N11d nozzle and welded insulation pad
RPV1-W13-2	B1.12	89	Proximity of the N17B, & N16C nozzles

The licensee stated:

"The conclusion is that performing a total of 92.9% of the Code required volume for all 15 welds, provides adequate means of ensuring that flaws will be discovered in essentially 100% of the weld volume of all Category B-A, Item No. B1.12 welds,

and this alternative therefore provides an adequate level of quality and safety.”

Licensee’s Basis for Proposed Alternative:

“Pursuant to 10CFR50.55a(g)(ii)(A)(5), relief is requested from performing the inservice examination for the inaccessible portions of the examination areas under Code Category B-A, Item B1.12.

“These three longitudinal weld seams were examined by automated ultrasonic using General Electric’s GERIS 2000 system (0°, 45° T-Scan, 45° P-Scan, 60° T-Scan, 60° P-Scan) supplemented by manual ultrasonic examinations to achieve the percentage of Code required coverage identified above. These welds had in-field physical obstructions/limitations inhibiting the performance of essentially 100% of the examination volume.

“There are a total of fifteen (15) RPV longitudinal weld seams (Code Category B-A, Item No. B1.12), with a total weld volume of 747 square inches. The combined total weld volume that was examined on all 15 welds was 694 square inches representing 92.9%. In addition, only one of the three welds (W-13-2) has any of its length in the beltline region (approximately 36 inches of its total length of 117 inches).

Evaluation: To comply with the augmented reactor vessel examination requirements of 10 CFR 50.55a(g)(6)(ii)(A), licensees must volumetrically examine essentially 100% of each of the Item B1.10 shell welds. The Regulations define “essentially 100%” as coverage greater than 90% of the examination volume of each weld. As an alternative to the requirement of the Regulations, the licensee proposed that the examination coverage obtained be considered to provide an acceptable level of quality and safety for the subject RPV welds.

At Hope Creek Generating Station, the augmented coverage requirements could not be met for three shell welds due to the proximity to nozzles, brackets and insulation pads. For Welds RPV1-W12-2, RPV1-W12-3, and RPV1-W13-2 the physical obstructions limited coverage to 79%, 78.7%, and 89%, of the required volume, respectively. To achieve complete coverage for the subject welds, design modifications of the vessel-to-nozzle configurations would be required to increase access.

As a result of the augmented volumetric examination rule, licensees must make a reasonable effort to maximize examination coverage of their reactor vessels. In cases where examination coverage from the inside surface (ID) is inadequate, examination from the outside surface (OD) using manual inspection techniques may be an option. At the Hope Creek Generating Station, the augmented examination was performed with the General Electric GERIS 2000 inspection tool from inside the vessel. In addition, the licensee supplemented the automated examinations with manual examinations from the OD to achieve the percentages of coverage identified.

The licensee has examined a significant portion of the subject welds. In addition, the licensee has met the coverage requirements for the remaining B1.12 RPV shell welds. Based on the volumetric examination coverages attained, and the full examinations conducted on other B1.10 RPV welds, the INEEL staff concludes that any significant patterns of degradation, if present, would have been detected and that the examinations performed provide reasonable assurance of the continued structural integrity of the subject welds. To require the licensee to modify the nozzle-to-shell configurations solely for increasing volumetric coverage would present a considerable hardship with no compensating increase in quality and safety. Therefore, it is recommended that the licensee's proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

F. Request for Relief RR-B1, Part A, Examination Category B-A, Pressure-Retaining Welds in Reactor Vessel

Code Requirement: Examination Category B-A, Item B1.30 requires a 100% volumetric examination of the reactor pressure vessel (RPV) shell-to-flange weld as defined by Figure IWB-2500-4. Item B1.12, Footnote 2, requires volumetric examination of essentially 100% of the length of RPV longitudinal shell welds, as defined by Figure IWB-2500-2. Item B1.22 requires volumetric examination of essentially 100% of the accessible length of RPV meridional head welds, as defined by Figure IWB-2500-3.

Licensee's Code Relief Request: Pursuant to 10 CFR 50.55a(g)(5)(iii) the licensee has requested relief from performing volumetric examinations to the extent required by the Code for the inaccessible portions of the Category B-A weld examination areas identified in the following table.¹

Comp. ID	Component Description	ASME Category	Item Number	Aggregate Coverage	Limitation
RPV1-W3	Circ. RPV Welds	B-A	B1.30	49.2%	Volumetric Examination - Shell to Flange Configuration. Summary No. 100005
RPV1-W12-2	Long. RPV Weld	B-A	B1.12	79%	Volumetric Examination - N5B nozzle restricts coverage. Summary No. 100060
RPV1-W12-3	Long. RPV Weld	B-A	B1.12	78.7%	Volumetric Examination - Support bracket, N11D nozzle, welded insulation pad restricts coverage. Summary No. 100065
RPV1-W13-2	Long. RPV Weld	B-A	B1.12	89.04%	Volumetric Examination - N17B, N16C and N9A Nozzles. Summary No. 100067

¹ These limitations are described and/or shown as summary numbers in the licensee's first ten year interval submittal dated December 15, 1998.

Comp. ID	Component Description	ASME Category	Item Number	Aggregate Coverage	Limitation
RPV1-W16-(1-8)	Merid. Head Weld	B-A	B1.22	77.9%	Volumetric Examination - Vessel Support Skirt. Summary Nos. 100100, 100105, 100110, 100115, 100120, 100125, 100130, 100135,

Licensee's Basis for Requesting Relief (as stated):

“For each of the subject examination areas, geometric configuration and permanent obstructions affect the ability to obtain complete Code Coverage. The prevailing limitations and the specific reliefs for each weld are noted in Appendix C, along with the individual weld numbers, the estimated areas of coverage, and the bases for limitation.

“The subject welds received volumetric examination by radiography and/or surface examinations during fabrication, in accordance with ASME Section III requirements which provided adequate assurance of the structural integrity of the welds prior to plant operation.”

Licensee's Proposed Alternative Examination (as stated):

“Alternate examinations were considered for each area where a limitation exists, however, no alternate examinations were considered to be appropriate.

“The system pressure test conducted on the Class 1 pressure boundaries provides an acceptable level of assurance of system integrity and plant safety.”

Evaluation: The Code requires 100% volumetric examination of pressure-retaining longitudinal shell, meridional head, and shell-to-flange reactor pressure vessel welds. However, as shown in drawings² provided by the licensee, complete volumetric examination is limited by physical obstructions, such as the proximity of the weld area to the vessel support skirt, nozzles, weldments, or welded thermocouple pads that obstruct access to the examination area. Therefore, the Code coverage requirements are impractical for these welds. To complete the examinations to the extent required by the Code, the licensee would have to redesign and modify the reactor pressure vessel. Imposition of the Code requirements would result in a considerable burden on the licensee.

The licensee can perform approximately 49% of the cumulative Code-required examination for Weld RPV1-W3 and >78% for the remaining welds. Therefore, it is concluded that significant patterns of degradation should be detected by the examinations that can be completed, and reasonable assurance of the structural integrity of these longitudinal shell, meridional head, and shell-to-flange pressure-retaining welds is provided.

² These limitations are described and/or shown as summary numbers. in the licensee's first ten year interval submittal dated December 15, 1998.

Based on the impracticality of meeting the Code examination requirements for the subject welds, and the reasonable assurance provided by the examinations that can be completed, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

G. Request for Relief RR-B1, Part B, Examination Category B-D, Full Penetration Welds of Nozzles in Vessels

Code Requirement: Examination Category B-D, Item B3.90 requires a volumetric examination of reactor pressure vessel (RPV) nozzle-to-vessel welds as defined by Figure IWB-2500-7(a) and (b). The examination volume includes 100% of the weld length.

Licensee's Code Relief Request: Pursuant to 10 CFR 50.55a(g)(5)(iii) the licensee has requested relief from performing volumetric examinations to the extent required by the Code for the inaccessible portions of the RPV nozzle-to-vessel welds identified in the following table.

Comp. ID	Component Description	ASME Category	Item Number	Aggregate Coverage	Limitation
RPV1-N1B	Nozzle to Shell Weld	B-D	B3.90	71.44%	Volumetric Examination - Nozzle Configuration. Summary No. 100190
RPV1-N2D	Nozzle to Shell Weld	B-D	B3.90	79.7%	Volumetric Examination - Nozzle Configuration. Summary No. 100210
RPV1-N2E	Nozzle to Shell Weld	B-D	B3.90	76.98%	Volumetric Examination - Nozzle Configuration. Summary No. 100215
RPV1-N2F	Nozzle to Shell Weld	B-D	B3.90	77.5%	Volumetric Examination - Nozzle Configuration. Summary No. 100220
RPV1-N2G	Nozzle to Shell Weld	B-D	B3.90	77.5%	Volumetric Examination - Nozzle Configuration. Summary No. 100225
RPV1-N2H	Nozzle to Shell Weld	B-D	B3.90	73.93%	Volumetric Examination - Nozzle Configuration. Summary No. 100230

Licensee's Basis for Requesting Relief (as stated):

“For each of the subject examination areas, geometric configuration and permanent obstructions affect the ability to obtain complete Code Coverage. The prevailing limitations and the specific reliefs for each weld are noted in Appendix C, along with the individual weld numbers, the estimated areas of coverage, and the bases for limitation.

“The subject welds received volumetric examination by radiography and/or surface examinations during fabrication, in accordance with ASME Section III requirements which provided adequate assurance of the structural integrity of the welds prior to

plant operation.”

Licensee’s Proposed Alternative Examination (as stated):

“Alternate examinations were considered for each area where a limitation exists, however, no alternate examinations were considered to be appropriate.

“The system pressure test conducted on the Class 1 pressure boundaries provides an acceptable level of assurance of system integrity and plant safety.”

Evaluation: The Code requires 100% volumetric examination of the subject RPV nozzle-to-vessel welds. However, as shown in drawings³ provided by the licensee, nozzle configurations and outside surface geometries restrict access and make 100% volumetric examination of these welds impractical. To complete the examinations to the extent required by the Code, the licensee would have to redesign and modify the nozzles and/or reactor pressure vessel. Imposition of the Code requirements would result in a considerable burden on the licensee.

The licensee can examine a significant portion (71%) of the cumulative Code-required volume for these welds. Therefore, it is concluded that significant patterns of degradation should be detected by the examinations that can be completed and that reasonable assurance of the structural integrity of these nozzle-to-vessel pressure retaining welds is provided.

Based on the impracticality of meeting the Code requirements for the subject welds, and the reasonable assurance provided by the examinations that can be completed, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

H. Request for Relief RR-B1 Part C, Examination Category B-H, Item B8.10, RPV Integrally Welded Attachments

Code Requirement: Examination Category B-H, Item B8.10 requires 100% volumetric or surface examination of RPV integrally welded attachments as described in applicable Figures IWB-2500-13, -14, and -15, each inspection interval.

Licensee’s Code Relief Request: Pursuant to 10 CFR 50.55a(g)(5)(iii) the licensee has requested relief from performing volumetric or surface examinations to the extent required by the Code for the inaccessible portions of attachment Weld RPV1-WSB(1-8) as identified in the following table.

³ These limitations are described and/or shown as summary numbers in the licensee’s first ten year interval submittal dated December 15, 1998.

Comp. ID	Component Description	ASME Category	Item Number	Aggregate Coverage	Limitation
RPV1-WSB (1-8)	Integrally Welded Attachments	B-H*	B8.10*	34% - 0° bracket 59% - 45° bracket	Surface Examination - Permanent Insulation Interference. Summary No. 100889
*In the Licensee's second interval submittal this component was categorized as B-K, item B10.10. However, the summary referenced, and Licensee's first ten year interval submittal dated March 3, 1998 clarified that the component is ASME Category B-H, Item Number B8.10.					

Licensee's Basis for Requesting Relief (as stated):

"For each of the subject examination areas, geometric configuration and permanent obstructions affect the ability to obtain complete Code Coverage. The prevailing limitations and the specific reliefs for each weld are noted in Appendix C, along with the individual weld numbers, the estimated areas of coverage, and the bases for limitation.

"The subject welds received volumetric examination by radiography and/or surface examinations during fabrication, in accordance with ASME Section III requirements which provided adequate assurance of the structural integrity of the welds prior to plant operation."

Licensee's Proposed Alternative Examination (as stated):

"Alternate examinations were considered for each area where a limitation exists, however, no alternate examinations were considered to be appropriate.

"The system pressure test conducted on the Class 1 pressure boundaries provides an acceptable level of assurance of system integrity and plant safety."

Evaluation: The Code requires 100% volumetric or surface examination of integrally welded attachments. However, as shown in the drawings⁴ provided by the licensee, complete surface or volumetric examination is limited by permanently installed insulation support brackets that obstruct access to the examination area. Therefore, the Code examination requirements are impractical for these integrally welded attachments. To complete the examinations to the extent required by the Code, the licensee would have to redesign and modify the insulation support brackets on the RPV. Imposition of the Code requirements would result in a considerable burden on the licensee.

The licensee can examine the subject integrally welded attachments to the extent practical, obtaining 34% of the Code-required surface coverage of the integrally welded attachment at 0°, and 59% at 45° using magnetic particle testing. In addition, the licensee can complete the Code-required examinations at 90°, 135°, 180°, 225°, 270°, and 315°. Therefore, it is

⁴ These limitations are described and/or shown as summary numbers in the licensee's first ten year interval submittal dated December 15, 1998.

concluded that significant patterns of degradation should be detected by the examinations that can be completed and reasonable assurance of the structural integrity of these integrally welded attachments is provided.

Based on the impracticality of meeting the Code requirements for the subject welds, and the reasonable assurance provided by the examinations that can be completed, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

I. Request for Relief RR-B1, Part D, Examination Category B-J, Items B9.11 and B9.12, Pressure Retaining Circumferential and Longitudinal Pipe Welds

Code Requirement: Examination Category B-J, Items B9.11 and B9.12 require 100% surface and volumetric examination of circumferential and longitudinal welds in pressure-retaining piping NPS 4 or larger, as defined by Figure IWB-2500-8, each inspection interval.

Licensee's Code Relief Request: Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee has requested relief from performing surface and volumetric examinations to the extent required by the Code for the welds identified in the following table.

Comp. ID	Component Description	ASME Category	Item Number	Aggregate Coverage	Limitation
7	Line 1-AB-26DLA-030. Pipe to Elbow	B-J	B9.11	70%	Surface Examination - Bracket Interference. Summary No. 101850
5	Line 1-AB-26DLA-033. Pipe to Elbow	B-J	B9.11	87%	Surface Examination - Box Support Interference. Summary No. 102750
8	Line 1-AB-26DLA-030. Pipe to Elbow	B-J	B9.11	80%	Surface Examination - Hanger Obstruction. Summary No. 102835
2LD	Line 1-BC-12CCA-115. Long. Seam	B-J	B9.12	87.5% PT 83.3% UT	Surface and Volumetric - Welded Strapping Band Interference. Summary No. 109106
4	Line 1-FD-10DBA-001. Pipe to Elbow	B-J	B9.11	85% MT 89% UT	Surface and Volumetric - Pipe Restraint Interference. Summary No. 110565
6	Line 1-FD-10DBA-001. Pipe to Elbow	B-J	B9.11	70%	Surface - Pipe Restraint Interference. Summary No. 110575

Licensee's Basis for Requesting Relief (as stated):

“For each of the subject examination areas, geometric configuration and permanent obstructions affect the ability to obtain complete Code Coverage. The prevailing limitations and the specific reliefs for each weld are noted in Appendix C, along with the individual weld numbers, the estimated areas of coverage, and the bases for limitation.

“The subject welds received volumetric examination by radiography and/or surface examinations during fabrication, in accordance with ASME Section III requirements which provided adequate assurance of the structural integrity of the welds prior to plant operation.”

Licensee's Proposed Alternative Examination (as stated):

“Alternate examinations were considered for each area where a limitation exists, however, no alternate examinations were considered to be appropriate.

“The system pressure test conducted on the Class 1 pressure boundaries provides an acceptable level of assurance of system integrity and plant safety.”

Evaluation: The Code requires 100% volumetric and surface examinations of circumferential and longitudinal welds in Class 1 pressure-retaining piping NPS 4 or larger. However, as shown in drawings⁵ provided by the licensee, the extent of surface and volumetric examinations of circumferential Welds 4 and 2LD are limited by interference from pipe supports and banding that obstruct access to the examination areas. The extent of surface examinations of Welds 5, 6, 7, and 8 is limited by a box support pad, pipe restraint, instrumentation bracket, banding, and a component support. Therefore, the Code volumetric and/or surface coverage requirements are impractical for these welds. To complete the examinations to the extent required by the Code the licensee would have to redesign and modify the subject piping and/or piping supports. Imposition of the Code coverage requirements would result in a considerable burden on the licensee.

For the subject welds, the licensee can perform 70%-89% of the cumulative Code-required surface examination, and 83.3%-100% of the Code-required volumetric examination. Based upon the significant portion of the weld that can be examined, it is concluded that significant patterns of degradation should be detected, and reasonable assurance of the structural integrity of these circumferential welds is provided.

Based on the impracticality of meeting the Code requirements for the subject examination areas, and the reasonable assurance provided by the examinations that can be completed, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i) for the subject welds.

⁵ These limitations are described and/or shown as summary numbers in the licensee's first ten year interval submittal dated December 15, 1998.

J. Request for Relief RR-B1, Part E, Examination Category B-J, Items B9.21, Pressure-Retaining Circumferential Pipe Welds Less Than 4 Inch NPS

Code Requirement: Examination Category B-J, Item B9.21 requires 100% surface examination of circumferential welds in pressure-retaining piping less than NPS 4, as defined by Figure iw-2500-8, each inspection interval.

Licensee’s Code Relief Request: Pursuant to 10 CFR 50.55a(g)(5)(iii) the licensee requested relief from performing surface examinations to the extent required by the Code for the welds identified in the following table.

Comp. ID	Component Description	ASME Category	Item No.	Aggregate Coverage	Limitation
3	Line 1-BH-2CCA-011. Tee to Reducer	B-J	B9.21	45%	Surface - Wall Interference. Summary No. 112020
7	Line 1-BH-2CCA-011. Pipe to Tee	B-J	B9.21	60%	Surface - Wall Interference. Summary No. 112060
1	Line 1-BH-1.50CCA-011. Reducer to Pipe	B-J	B9.21	46%	Surface - Wall Interference. Summary No. 112300
12B	Line 1-BH-1.50CCA-011. Flue Head to Pipe	B-J	B9.21	0%	Surface - Within Penetration. Summary No. 112414
12C	Line 1-BH-1.50CCA-011. Pipe to Coupling	B-J	B9.21	0%	Surface - Within Penetration. Summary No. 112416
12D	Line 1-BH-1.50CCA-011. Coupling to Pipe	B-J	B9.21	0%	Surface - Within Penetration. Summary No. 112418

Licensee’s Basis for Requesting Relief (as stated):

“For each of the subject examination areas, geometric configuration and permanent obstructions affect the ability to obtain complete Code Coverage. The prevailing limitations and the specific reliefs for each weld are noted in Appendix C, along with the individual weld numbers, the estimated areas of coverage, and the bases for limitation.

“The subject welds received volumetric examination by radiography and/or surface examinations during fabrication, in accordance with ASME Section III requirements which provided adequate assurance of the structural integrity of the welds prior to plant operation.”

Licensee’s Proposed Alternative Examination (as stated):

“Alternate examinations were considered for each area where a limitation exists, however, no alternate examinations were considered to be appropriate.

“The system pressure test conducted on the Class 1 pressure boundaries provides an acceptable level of assurance of system integrity and plant safety.”

Evaluation: The Code requires 100% surface examination of circumferential welds in Class 1 pressure-retaining piping less than NPS 4. However, the extent of surface examinations of Welds 1, 3, and 7 is limited by interference from a permanent wall. The extent of surface examinations of Welds 12B, 12C, and 12D is limited because these welds are enclosed within penetrations. Therefore, the Code's surface examination requirements are impractical for these welds. To complete the examinations to the extent required by the Code, the licensee would have to redesign and modify the subject piping and/or existing wall penetrations. Imposition of this requirement would result in a considerable burden on the licensee.

For Welds 1, 3, and 7, the licensee can examine 46%, 45%, and 60% of the required surface coverage, respectively. It appears that no surface examination can be performed on Welds 12B, 12C, and 12D. However, the licensee has not provided drawings or a sufficiently detailed description of the limitations in the current submittal. From a review of the licensee's Inservice Inspection Program Plan, these welds represent only part of a larger population of B-J, Item B9.21 welds. In addition, information in the licensee's Inservice Inspection Program suggests that it may be possible for examinations of other, similar, welds to be substituted for the welds with 0% coverage.

Therefore, it is concluded that the licensee has not provided sufficient information to support a determination that relief should be granted according to the criteria of 10 CFR 50.55a. Therefore, it is recommended that relief be denied for the subject welds.

K. Request for Relief RR-B1, Part F, Examination Category B-J, Item B9.31, Class 1 Component Limited Exams

Code Requirement: Examination Category B-J, Item B9.31 requires 100% surface and volumetric examination of branch pipe connection welds in pressure-retaining piping NPS 4 or larger, as defined by Figures IWB-2500-9, -10, and -11 each inspection interval.

Licensee's Code Relief Request: Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee has requested relief from performing volumetric examinations to the extent required by the Code for the welds identified in the following table.

Comp. ID	Component Description	ASME Category	Item Number	Aggregate Coverage	Limitation
6BC1	Line 1-AB-26DLA-033. Branch Connection	B-J	B9.31	82%	Volumetric - Restraint Interference. Summary No. 102790
3BC1	Line 1-BB-22VCA-014. Branch Connection	B-J	B9.31	85%	Volumetric Examination - Whip restraint Interference. Summary No. 106980

Licensee's Basis for Requesting Relief (as stated):

"For each of the subject examination areas, geometric configuration and permanent obstructions affect the ability to obtain complete Code Coverage. The prevailing limitations and the specific reliefs for each weld are noted in Appendix C, along with the individual weld numbers, the estimated areas of coverage, and the

bases for limitation.

“The subject welds received volumetric examination by radiography and/or surface examinations during fabrication, in accordance with ASME Section III requirements which provided adequate assurance of the structural integrity of the welds prior to plant operation.”

Licensee’s Proposed Alternative Examination (as stated):

“Alternate examinations were considered for each area where a limitation exists, however, no alternate examinations were considered to be appropriate.

“The system pressure test conducted on the Class 1 pressure boundaries provides an acceptable level of assurance of system integrity and plant safety.”

Evaluation: The Code requires 100% volumetric and surface examinations of branch pipe connection welds in Class 1, pressure-retaining piping NPS 4 or larger. The volumetric examinations of Item B9.31 branch pipe connection Welds 6BC1 and 3BC1 are limited by permanently installed pipe/whip restraints that limit access to the examination area. Therefore, the Code volumetric examination requirements are impractical for these welds. To gain access for examination of these welds, these restraints would have to be removed and reinstalled, or permanently redesigned and modified. Imposition of the Code requirements for these welds would result in a considerable burden on the licensee.

The licensee can examine a significant portion of the required volume, 82% and 85%, for Welds 6BC1 and 3BC1, respectively. The licensee can also complete 100% of the required surface examination for these welds. Therefore, it is concluded that significant patterns of degradation should be detected by the examinations that can be completed and reasonable assurance of the structural integrity of these branch pipe connection is provided.

Based on the impracticality of meeting the Code coverage requirements for the subject examination areas, and the reasonable assurance provided by the examinations that can be completed, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

- L. Request for Relief RR-B3, Use of Code Case N-547, Alternative Examination Requirements for Pressure Retaining Bolting in Control Rod Drive (CRD) Housings, Section XI, Division 1

Note: In response to the NRC RAI, Request for Relief RR-B3 was withdrawn by licensee in the letter dated October 25, 1999.

- M. Request for Relief RR-C1, Part A, Examination Category C-A, Item C1.10, Pressure Retaining Welds in Pressure Vessels

Code Requirement: Examination Category C-A, Item Number C1.10 requires a volumetric examination of the Residual Heat Removal Heat Exchanger shell-to-flange weld as defined by Figure IWC-2500-1. The examination coverage shall include essentially 100% of the weld length.

Licensee’s Code Relief Request: Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee requested relief from performing volumetric examinations to the extent required by the Code for the inaccessible portions of the Class 2, Category C-A, weld identified in the following table.

Comp. ID	Component Description	ASME Category	Item Number	Aggregate Coverage	Limitation
RHX-W4	RHR Heat Exchanger AE 205 (B001A)	C-A	C1.10	88%	Volumetric Examination - Flange Configuration. Summary No. 200080

Licensee's Basis for Requesting Relief (as stated):

"For each of the subject examination areas, geometric configuration and permanent obstructions affect the ability to obtain complete Code Coverage. The prevailing limitations and the specific reliefs for each weld are noted in Appendix C, along with the individual weld numbers, the estimated areas of coverage, and the bases for limitation.

"The subject welds received volumetric examination by radiography and/or surface examinations during fabrication, in accordance with ASME Section III requirements. These examinations provided adequate assurance of the structural integrity of the welds prior to plant operation."

Licensee's Proposed Alternative Examination (as stated):

"Alternate examinations were considered for each area where a limitation exists, however, no alternate examinations were considered to be appropriate.

"The system pressure test conducted on the Class 2 pressure boundaries provides an acceptable level of assurance of system integrity and plant safety."

Evaluation: The Code requires 100% volumetric examination of pressure-retaining circumferential shell welds in Class 2 pressure vessels. However, as shown in drawings⁶ provided by the licensee, the extent of volumetric examination for the subject component is limited by interference from the flange studs that obstruct access to the examination area. Therefore, the Code examination requirement is impractical for this weld. To increase examination coverage, the component would have to be redesigned/modified or disassembled. Imposition of the Code requirement would result in a considerable burden on the licensee.

The licensee can examine a significant amount (88.6%) of the Code-required volume for Weld RHX-W4. Therefore, it is concluded that significant patterns of degradation should be detected by the examination that can be completed and that reasonable assurance of the structural integrity of the pressure-retaining circumferential shell welds is provided.

Based on the impracticality of meeting the Code requirements for the subject weld, and the reasonable assurance provided by the examinations that can be completed, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

⁶ These limitations are described and/or shown as summary numbers in the licensee's first ten year interval submittal dated December 15, 1998.

N. Request for Relief RR-C1, Part B, Examination Category C-B, Item C2.20, Pressure Retaining Nozzle Welds in Vessels

Code Requirement: Examination Category C-B, Item C2.21 requires 100% volumetric and surface examination as defined by figure IWC-2500-4(a) or (b) for Class 2 Nozzle-to-Shell welds. Item C2.22 requires 100% volumetric examination as defined by Figure IWC-2500-4(c) of Nozzle Inside Radius Sections.

Licensee's Code Relief Request: Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee has requested relief from performing volumetric examinations to the extent required by the Code for the inaccessible portions of the Class 2, Category C-B, weld examinations identified in the following table.

Comp. ID	Component Description	ASME Category	Item No.	Aggregate Coverage	Limitation
RHX-W6	RHR Heat Exchanger AE 205 (B001A) Nozzle to Shell	C-B	C2.21	89%	Volumetric Examination - Nozzle Configuration Summary No. 200100
RHX-IR2	RHR Heat Exchanger AE 205 (B001A) Inside Radius Section	C-B	C2.22	26%	Volumetric Examination - Nozzle Blend Radius Configuration Summary No. 200120

Licensee's Basis for Requesting Relief (as stated):

"For each of the subject examination areas, geometric configuration and permanent obstructions affect the ability to obtain complete Code Coverage. The prevailing limitations and the specific reliefs for each weld are noted in Appendix C, along with the individual weld numbers, the estimated areas of coverage, and the bases for limitation.

"The subject welds received volumetric examination by radiography and/or surface examinations during fabrication, in accordance with ASME Section III requirements. These examinations provided adequate assurance of the structural integrity of the welds prior to plant operation."

Licensee's Proposed Alternative Examination (as stated):

"Alternate examinations were considered for each area where a limitation exists, however, no alternate examinations were considered to be appropriate.

"The system pressure test conducted on the Class 2 pressure boundaries provides an acceptable level of assurance of system integrity and plant safety."

Evaluation: The Code requires 100% surface and volumetric examination of Class 2 pressure vessel nozzle-to-shell welds and 100% volumetric examination of nozzle inside radius sections. However, as shown in drawings⁷ provided by the licensee, complete

⁷ These limitations are described and/or shown as summary numbers in the licensee's first ten year interval submittal dated December 15, 1998.

volumetric examination of Welds RHX-W6 and RHX-IR2 is limited due to the nozzle configuration and the nozzle inner bend radius. Therefore, the Code requirements are impractical for these welds. To obtain increased examination coverage, the vessel and/or nozzles would have to be redesigned and modified. Imposition of the Code requirements would result in a considerable burden on the licensee.

The licensee can complete 89% and 100% of the Code-required volumetric and surface examinations for Weld RHX-W6 and 26.4% of the volumetric examination for Weld RHX-IR2. Therefore, it is concluded that significant patterns of degradation should be detected by the examinations that can be completed and that reasonable assurance of the structural integrity of the nozzle is provided.

Based on the impracticality of meeting the Code requirements for the subject welds, and the reasonable assurance provided by the examinations that can be completed, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

O. Request for Relief RR-C1, Part C, Examination Category C-G, Item C6.10, Pressure Retaining Welds in Pumps and Valves

Code Requirement: Examination Category C-G, Item C6.10 requires 100% surface examination of Class 2 pressure-retaining pump casing welds, as defined by Figure IWC-2500-8, each inspection interval.

Licensee's Code Relief Request: Pursuant to 10 CFR 50.55a(g)(5)(iii), the licensee has requested relief from performing surface examinations to the extent required by the Code for the Class 2, Category C-G, welds identified in the following table.

Comp. ID	Component Description	ASME Category	Item No.	Aggregate Coverage	Limitation
CSP-W1	Core Spray Pump CP 206 (C001C). Pump Casing Weld	C-G	C6.10	0%	Surface Examination - Inaccessible due to pump cover section being encased within concrete pump pedestal
CSP-W2	Core Spray Pump CP 206 (C001C). Pump Casing Weld	C-G	C6.10	73%	Surface Examination - Inaccessible due to pump pedestal
CSP-W5	Core Spray Pump CP 206 (C001C). Pump Casing Weld	C-G	C6.10	0%	Surface Examination - Inaccessible due to flange bolting interference
RHP-W1	Residual Heat Removal Pump DP 202. Pump Casing Weld	C-G	C6.10	0%	Surface Examination - Inaccessible due to pump pedestal
RHP-W2	Residual Heat Removal Pump DP 202. Pump Casing Weld	C-G	C6.10	18%	Surface Examination - Inaccessible due to pump pedestal

Comp. ID	Component Description	ASME Category	Item No.	Aggregate Coverage	Limitation
RHP-W3	Residual Heat Removal Pump DP 202. Pump Casing Weld	C-G	C6.10	23%	Surface Examination - Inaccessible due to pump pedestal

Licensee's Basis for Requesting Relief (as stated):

“For each of the subject examination areas, geometric configuration and permanent obstructions affect the ability to obtain complete Code Coverage. The prevailing limitations and the specific reliefs for each weld are noted in Appendix C, along with the individual weld numbers, the estimated areas of coverage, and the bases for limitation.

“The subject welds received volumetric examination by radiography and/or surface examinations during fabrication, in accordance with ASME Section III requirements. These examinations provided adequate assurance of the structural integrity of the welds prior to plant operation.”

Licensee's Proposed Alternative Examination (as stated):

“Alternate examinations were considered for each area where a limitation exists, however, no alternate examinations were considered to be appropriate.

“The system pressure test conducted on the Class 2 pressure boundaries provides an acceptable level of assurance of system integrity and plant safety.

For CSP-W5 the licensee stated they will “examine when flange is disassembled for maintenance.”

Evaluation: The Code requires that Class 2 pump casing welds receive a 100% surface examination. The drawings supplied by the licensee show that the above listed pump casing welds are encased in concrete, or obstructed due to the pump pedestal or flange bolting. These limitations preclude surface examination. Therefore, these surface examinations are impractical to perform to the extent required by the Code. To perform the Code-required examination, the pumps and/or their surrounding support structure would have to be redesigned, modified, or disassembled. Imposition of this requirement would cause a considerable burden on the licensee.

The licensee can examine 18%, 23%, and 73% of Welds RHP-W2, RHP-W3, CSP-W2 respectively; Welds CSP-W1 and RHP-W1 can not be examined. The licensee has proposed to examine Weld CSP-W5 when the pump is disassembled for maintenance. Any significant patterns of degradation should be detected by the examinations that can be completed, and reasonable assurance of the structural integrity of the subject pump casing welds is provided.

Based on the impracticality of meeting the Code requirements for the subject welds, and the reasonable assurance provided by the examinations that can be completed, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

P. Request for Relief RR-C2, Proposed Alternative to Code Case N-498-1, 4-Hour Hold Time For Insulated Components

Code Requirement: Code Case N-498-1⁸ allows a system pressure test to be performed at nominal operating pressure on Class 2 and Class 3 components as an alternative to the ten-year system hydrostatic test required by Categories C-H, D-A, D-B, and D-C. The system pressure test alternative provided by the Code Case requires a four-hour hold time at nominal operating pressure before performing the required visual examination for components that are insulated

Licensee's Proposed Alternative: In accordance with 10 CFR 50.55a(a)(3)(ii), the licensee proposed to perform the alternative system pressure test (as required by N-498-1) using a 20-minute hold time for insulated portions of High Pressure Coolant Injection (HPCI) pump discharge piping, HPCI turbine steam supply and exhaust lines, and associated drains and vents, in lieu of the required 4-hour hold time.

The licensee stated:

“The system pressure test described in Code Case N-498-1 will be conducted as required except that a twenty minute hold time will be used in lieu of the four hour hold time requirement. The twenty minute hold period will allow time for potential leaks to migrate through the insulation without challenging the Technical Specification limitation on maximum suppression pool water temperature.”

Licensee's Basis for Proposed Alternative (as stated):

“Pursuant to 10 CFR 50.55a(a)(3)(ii), PSE&G is requesting this relief on the basis that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

“As part of the Emergency Core Cooling System (ECCS), the HPCI system is not required to operate during normal plant operation. However, the system is periodically tested in accordance with applicable requirements. These periodic tests are conducted to verify the operability of the applicable components. The functional test of the HPCI pump and turbine normally includes about (30) minutes of pump run time. In order to satisfy the hold time requirement of Code Case N-498-1, the test would require a HPCI pump run in excess of 4 hours (hold time plus examination time).

“Running the HPCI pump for this duration is not practical and represents a undue hardship on the facility without compensating increase in the level of quality and safety. Operating the HPCI pump for the period of time required to satisfy the four hour hold time would subject the facility to unnecessarily excessive heat loads. Control of these heat loads would require the operation of additional ECCS subsystems to remove heat from the suppression pool.

⁸ Code Case N-498-1 Alternative Rules for 10-Year System Hydrostatic Testing for Class 1, 2, and 3 Systems, was approved for use at Hope Creek Generating Station by NRC letter dated March 17, 1995.

“Extended operation of the HPCI pump would also challenge the Technical Specification limitation on maximum suppression pool water temperature. Hope Creek Technical Specifications requires the suppression pool average water temperature to be maintained less than 105°F during testing which adds heat to the suppression chamber. Operating the HPCI pump for a period substantially longer than the system functional test could cause this temperature to be exceeded. If the suppression pool average water temperature exceeds 110°F, Technical Specifications require the reactor mode switch to be placed in the Shutdown position.

“During normal plant operation, with the HPCI system in the standby condition, the HPCI pump discharge line is maintained continuously above atmospheric pressure by operation of the HPCI jockey pump. While this pressure is less than the nominal operating pressure required by Code Case N-498-1, it does provide assurance that any leakage at this lower pressure, if it is occurring, will migrate through insulation.

“Removal of the insulation from the subject components in order to use the ten minutes hold time allowed by Code Case N-498-1 would be equally burdensome. The costs associated with insulation removal and reinstallation, including resource diversion, radiation exposure and additional radwaste, are not justified by a compensating increase in the level of quality and safety.

“Performing an HPCI system hydrostatic test would also be burdensome. A hydrostatic test would require installation of blank flanges and temporary pipe supports, and gagging or removal of relief valves. The time, costs and radiation exposure incurred in carrying out a hydrostatic test would result in a hardship without a compensating increase in the level of quality and safety.”

Evaluation: Examination Category C-H for Class 2 systems and Categories D-A, D-B, and D-C for Class 3 systems require a system hydrostatic test each inspection interval. By SER dated March 17, 1995, the licensee obtained approval to use Code Case N-498-1 *Alternative Rules for 10-Year System Hydrostatic Testing for Class 1, 2, and 3 Systems*. Code Case N-498-1 allows a system pressure test to be performed at nominal operating pressure on Class 1, 2, and 3 components as an alternative to the ten-year system hydrostatic test. The alternative system pressure test allowed by the Code Case requires a 4-hour hold time for systems that are insulated. The intent of the 4-hour hold time for insulated components is to allow leakage to penetrate the insulation prior to visual examination. The licensee contends that a 4-hour hold time for the portions of the subject insulated systems creates an undue hardship without a compensating increase in the level of quality and safety.

For the licensee to maintain a 4-hour hold time, operation of the HPCI pump would be required. Operation of the HPCI pump for this length of time would subject the plant to excessive heat loads. To control the heat loads, operation of the ECCS subsystems to remove heat from the suppression pool would also be required. Prolonged operation of the HPCI pump would challenge the Technical Specification limitation on maximum suppression pool water temperature. If the maximum suppression pool water temperature is exceeded, plant Technical Specifications require the reactor mode to be placed in a shutdown

condition. Removing the insulation for the purpose of utilizing the twenty minute hold time would result in excessive radiation exposure to plant personnel, which would cause hardship without a compensating increase in safety.

When the system is in standby condition during normal plant operation, the HPCI pump discharge line is maintained above atmospheric pressure by operation of the HPCI jockey pump. This pressure is less than the nominal operating pressure required by Code Case N-498-1. However, a 20 minute hold time at nominal operating pressure in conjunction with the continuous hold time at the lower pressure provided by the jockey pump will provide reasonable assurance that if leakage occurs, it will permeate through the insulation.

The INEEL staff has evaluated the licensee's submittal and concludes that the proposed alternative will provide reasonable assurance of the structural integrity of the affected systems, and that imposing the requirements of the Code Case on limited portions of the subject insulated systems would cause an undue burden without a compensating increase in the level of quality and safety. Therefore, it is recommended that the licensee's proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

Q. Request for Relief RR-C3, Use of Code Case N-522, Pressure Testing of Containment Penetration Piping, Section XI, Division 1

Note: In response to the NRC RAI, Request for Relief RR-C3 was withdrawn by licensee in the letter dated October 25, 1999.

3. CONCLUSION

The INEEL staff evaluated the licensee's submittal and concluded that certain inservice examinations cannot be performed to the extent required by the Code at the Hope Creek Generating Station.

The INEEL staff reviewed the licensee's submittals and concludes that for Requests for Relief RR-A2 and RR-A4 the licensee's proposed alternatives to the Code requirements provide an acceptable level of quality and safety. Therefore, it is recommended that these proposed alternatives be authorized pursuant to 10 CFR 50.55a(a)(3)(i). For Requests for Relief RR-B5 and RR-C2, it is concluded that the Code requirements would result in a hardship without a compensating increase in the level of quality and safety. Therefore, it is recommended that these proposed alternatives be authorized pursuant to 10 CFR 50.55a(a)(3)(ii). For Requests for Relief RR-B1, Parts A, B, C, D, F, and RR-C1, Parts A, B, C, it is concluded that the Code requirements are impractical for the subject welds. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i). For Request for Relief RR-B1, Part E, the INEEL staff concludes that the licensee has not provided adequate information to support a determination that the Code requirements are impractical; therefore, it is recommended that relief not be granted for Relief Request RR-B1, Part E.

Requests for Relief RR-A3, RR-B3, and RR-C3 were withdrawn by the licensee in the letter dated October 25, 1999

Request for Relief RR-A1, regarding inservice testing of mechanical and hydraulic

snubbers, was not evaluated by INEEL.