UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AN INSERVICE INSPECTION REQUEST FOR RELIEF

PP&L, INC.

SUSQUEHANNA STEAM ELECTRIC STATION, UNITS 1 AND 2

DOCKET NOS. 50-387 AND 50-388

1.0 INTRODUCTION

In the Federal Register (61 FR 41303), dated August 8, 1996, the Nuclear Regulatory Commission (NRC) announced an amendment to its regulations in Title 10 of the Code of Federal Regulations, Section 50.55a (10 CFR 50.55a; the rule). This amendment to the rule incorporated by reference the 1992 Edition with 1992 Addenda of Subsections IWE and IWL of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (the Code). Subsections IWE and IWL of the Code provide the requirements for inservice inspection (ISI) of Class CC (concrete containments), and Class MC (metallic containments) of light-water cooled power plants. The effective date for the amended rule was September 9, 1996, and it requires licensees to incorporate the new requirements into their ISI plans and to complete the first containment inspection by September 9, 2001. However, a licensee can submit a request for relief from one, or more, requirements of the regulation (or the endorsed Code requirements) with proper justification. The provisions for granting relief or authorizing alternatives are contained in 10 CFR 50.55a(a)(3)(i), (a)(3)(ii), or (g)(6)(i). In order to obtain authorization or relief, the licensee must demonstrate that: (1) the proposed alternative provides an acceptable level of quality and safety; (2) compliance would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety; or (3) conformance is impractical for its facility.

By letters dated August 4, 1998, (4 letters) the licensee, PP&L, Inc., submitted Requests for Relief Nos. RR-14, RR-15, RR-16, and RR-17, seeking relief from certain requirements of the ASME Code, Section XI, Subsections IWE and IWL, for the Susquehanna Steam Electric Station, Units 1 and 2. These relief requests have been submitted as part of the first 10-year primary containment inservice inspection program interval.

This evaluation addresses the merits of the requests for relief proposed by PP&L, Inc., for the Susquehanna Steam Electric Station, Units 1 and 2.

2.0 EVALUATION OF RELIEF REQUESTS

A. Request for Relief No. RR-14 (Rev. 0): Examination Category E-D, Items E5.10 and E5.20, Visual Examination of Seals and Gaskets

Enclosure

Code Requirement:

Examination Category E-D, Items E5.10 and E5.20, requires 100% visual examination (VT-3) during each inspection interval, for seals and gaskets on airlocks, hatches, and other devices that are required to assure containment leak tight integrity.

Licensee's Code Relief Request:

In accordance with 10 CFR 50.55a(a)(3)(ii), the licensee requests relief from the Code-required visual examination, VT-3, of seals and gaskets on airlocks, hatches, and other devices requiring VT-3 examination once each interval to assure containment leak-tight integrity.

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

" Visual examination of seals and gaskets require the associated joints to be disassembled and reassembled. For electrical penetrations this would involve a pre-maintenance [10 CFR Part 50,] Appendix J [local leak rate] test, verification of adequate cable slack for disassembly, disassembly, removal and examination of the seals and gaskets, joint reassembly, retermination and post maintenance of the cables as necessary, and a post maintenance Appendix J test of the penetration. Mechanical penetrations would be similar except for the slack verification, retermination and testing of the cables. Disassembling and reassembling equipment would risk damage to the equipment, require significant additional man-hours and personnel radiation exposure, without a compensating increase in the level of quality and safety. The 1993 Addenda of Section XI recognizing that joint disassembly is not warranted, now states in Examination Category E-D, Footnote 1, that sealed or gasketed connections need not be disassembled solely for the performance of examinations. This is also clarified in ASME Section XI Interpretation IN 96-28."

Licensee's Proposed Alternative (as stated):

"The leak tight integrity of seals and gaskets will be verified with the 10 CFR 50, Appendix J, Primary Containment Leakage Testing Program."

Staff Evaluation of RR-14:

In accordance with the 1992 Edition, with 1992 Addenda, of Subsections IWE and IWL of Section XI of the Code, which is incorporated by reference in 10 CFR 50.55a, seals and gaskets require 100% VT-3 examination during each inspection interval at Susquehanna Steam Electric Station, Units 1 and 2. However, inspection of the seals and gaskets requires disassembly and reassembly of airlocks, hatches, and other devices required to provide containment leakage integrity. The licensee proposes to use the existing 10 CFR Part 50, Appendix J leakage rate testing program to provide

verification of seal and gasket integrity, rather than disassembling the subject components for the sole purpose of examination.

Leakage testing of components in accordance with 10 CFR Part 50, Appendix J is conducted for the specific purpose of demonstrating containment leakage integrity (i.e. that containment leakage is within the acceptable limits of the plant technical specifications). Satisfactory performance of an Appendix J test on a component demonstrates not only its acceptability for providing containment integrity, but demonstrates the integrity of its associated seals and gaskets as well. Any components which fail an Appendix J test are required to be repaired and successfully pass a post-maintenance Appendix J test prior to being returned to service; gaskets and seals are inspected and/or replaced during the repair process. Thus, disassembly of joints for the sole purpose of performance of the visual examination is unwarranted; this is recognized in the 1993 Addenda to Section XI, Examination Category E-D, Footnote 1. Therefore, the staff finds that the integrity of the containment penetration seals and gaskets is verified by the leakage rate testing required by 10 CFR Part 50, Appendix J, during the inspection interval; and thus, given the hardship associated with Code compliance, imposition of the Code requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. For this reason, the licensee's proposed alternative contained in Relief Request RR-14 is authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

B. Request for Relief No. RR-15 (Rev. 0): IWE-2420(b) and (c), Successive Examinations After Repair

Code Requirement:

Table IWE-2500-1, Examination Category E-C, Items E4.10, E4.11 and E4.12 require the evaluation of flaws, degradation, or repairs to be reexamined until the area remains essentially unchanged for three consecutive inspection periods in accordance with IWE-2420 (b) and (c).

Licensee's Code Relief Request:

In accordance with 10 CFR 50.55a(a)(3)(ii), the licensee requests relief from ASME Code Section XI, 1992 Edition, Subsection IWE, Class MC, Paragraph IWE-2420 (b) and (c), which require three successive inspections following repairs.

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

" When a repair restores a component to an acceptable condition, successive examinations are not warranted. The requirements of Class 1, 2, or 3 Components in Paragraphs IWB-2420(b), IWC-2420 (b), or IWD-2420 (b) do not require a repair to be subjected to successive examinations. Thus, the successive examination requirement for repairs in accordance with IWE-2420 (b) and (c) constitute a burden without a

compensating increase in quality or safety. As stated in the NRC/NEI/EPRI meeting notes from H. Asher to G. Bagchi dated January 13, 1998, in Item 7, 'The staff believes that the successive examinations are required to monitor the flaws or degradations accepted by engineering evaluation (and not by repair). For repaired flaws evaluated and accepted by the requirements of IWA-4000, the staff does not believe that successive examinations are necessary.' "

Licensee's Proposed Alternative (as stated):

"Repairs of Class MC Components will be performed in accordance with IWA-4000 without performing successive examinations in accordance with IWE-2420 (b) and (c)."

Staff Evaluation of RR-15:

Paragraph IWE-2420(b) requires that when examinations result in performance of a repair/replacement activity, the items subjected to repair/replacement, shall be reexamined during the next inspection period. However, the licensee is proposing that repairs/replacements of Class MC components will be performed in accordance with the requirements of Paragraph IWA-4000 of the Code, the intent of which is to use the construction code to restore the component to its original condition, and the component will then be inspected on a normal inspection interval rather than reexamined during the next period.

Repair/replacement activities are followed by an examination to determine the suitability of the repair/replacement. Under the licensee's proposal, when the post-repair/replacement examination indicates the repair/replacement is acceptable, the component will have been restored to compliance with the Code. When, however, the post-repair/replacement examination indicates the repair/replacement is not suitable, then the repair does not meet Code requirements and the component is not acceptable for continued service; further restoration work would be required. Once a component is restored to Code compliance, successive examinations are not warranted and it is acceptable to return the component to a normal inspection interval. This approach is consistent with the successive examination requirements of Class 1, 2, and 3 components per Paragraphs IWB-2420(b), IWC-2420 (b), or IWD-2420 (b), and provides reasonable assurance of component integrity.

Since the proposed alternative will return components to Code compliance, the NRC staff finds that a successive examination performed in the next period is not warranted after repair or replacement of a component; and that imposition of the Code requirement of ASME Code Section XI, 1992 Edition, Subsection IWE, Class MC, Paragraph IWE-2420 (b) and (c) would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Therefore, the licensee's

proposed alternative contained in Relief Request RR-15 is acceptable, and is authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

C. Request for Relief No. RR-16 (Rev. 0): ASME Section XI, Subsection IWE-2500(a), Table IWE-2500-1, Examination Category E-G, Item Number E8.20, Bolt Torque/Tension Test of Pressure Retaining Bolted Connections

Code Requirement:

Examination Category E-G, Item E8.20, Bolted Connections, requires bolt torque or tension tests for bolted connections that have not been disassembled and reassembled during the inspection interval.

Licensee's Code Relief Request:

In accordance with 10 CFR 50.55a(a)(3)(ii), the licensee requests relief from ASME Code, Section XI, 1992 Edition, 1992 Addenda, Examination Category E-G, Item Number E8.20, which requires that pressure retaining bolted connections that have not been disassembled and reassembled during the interval, be subjected to a torque/tension test once each interval to assure leak tight integrity.

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

" Performing a torque/tension test requires that the bolted connection be retorqued or retensioned. This activity is considered maintenance and requires a 10 CFR 50, Appendix J, Type B test. The Type B test alone indicates the adequacy of the bolt torque or tension to maintain leakage within acceptable limits. Performance of a Type B leakage test and a visual examination is sufficient to demonstrate that the design function is met. As stated in the NRC/NEI/EPRI meeting notes from H. Asher to G. Bagchi dated January 13, 1998, in Item 8, 'For the pressure-unseating bolted connections, it is necessary to confirm that the bolt's pretension is maintained. If their adequacy is verified during Appendix J testing or during routine disassembling and reassembling, the staff believes that additional torque testing as per Table IWE-2500 (E8.20) is not needed.' "

Licensee's Proposed Alternative (as stated):

"The leak tight integrity of bolted connections that have not been disassembled during the interval will be verified with the 10 CFR 50, Appendix J, Primary Containment Leakage Testing Program, Type B Tests and a VT-1 visual examination of the exposed surfaces in accordance with Examination Category E-G, Item No. E8.10."

Staff Evaluation of RR-16:

Table IWE-2500-1, Examination Category E-G, Item E8.20 requires bolting to be torqued or retensioned once each interval to assure leak tight integrity. The licensee proposes to use the existing 10 CFR Part 50, Appendix J, leakage testing program, and a VT-1 visual examination as verification of the leak tight integrity of bolted connections, rather than performing torque or tension tests for bolting that has not been disassembled and reassembled during the inspection interval.

Leakage testing of components in accordance with 10 CFR Part 50, Appendix J is conducted for the specific purpose of demonstrating containment leakage integrity (i.e. that containment leakage is within the acceptable limits of the plant technical specifications). Satisfactory performance of an Appendix J, Type B (local leak rate) test on a bolted connection demonstrates the integrity of the assembly and the adequacy of the bolt torque or tension. Any bolted connections which fail an Appendix J test are required to be repaired and successfully pass a post-maintenance Appendix J test prior to being returned to service; bolt torque or tension will be verified during the repair process. Thus, the staff concludes that the integrity of bolted connections is verified during 10 CFR Part 50, Appendix J, Type B testing or during routine disassembling and reassembling and, hence, additional torque testing per Table IWE-2500(E8.20) is not needed. The staff finds that imposition of the Code requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Therefore, the licensee's proposed alternative contained in Relief Request RR-15 is acceptable and is authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

D. Request for Relief RR-17 (Rev. 0): ASME, Section XI, Subsections IWA-2210 and IWL-2310, Examination Category C-C, Item Numbers L1.11 and L1.12, Visual Examination and Personnel Qualification

Code Requirement:

ASME Code, Section XI, Subparagraph IWL-2310, Examination Category L-A, Item Numbers L1.11 and L1.12, require VT-1C and VT-3C examinations for all areas and suspect areas; Subparagraph IWA-2210, Table IWA-2210-1, sets the minimum illumination and maximum direct examination distance for the visual examination.

Licensee's Code Relief Request:

In accordance with 10 CFR 50.55a(a)(3)(ii), the licensee requests relief from ASME, Section XI, Subparagraphs IWA-2210 and IWL-2310, which specify the minimum illumination and maximum distance required for direct examination of all concrete containment surfaces.

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

" The NRC recognized the difficulty of obtaining the minimum illumination and maximum distance requirements for steel containment structures by providing an alternative in 10 CFR 50.55a(b)(2)(x)(B) which states, ' When performing remotely the visual examinations required by Subsection IWE, the maximum direct examination distance specified in Table IWA-2210-1 may be extended and the minimum illumination requirements specified in Table IWA-2210-1 may be decreased provided that the conditions or indications for which the visual examination is performed can be detected at the chosen distance and illumination.' "

Licensee's Proposed Alternative (as stated):

"As permitted for metal containments, the minimum illumination and maximum examination distances for remote visual examination of the concrete containments will be controlled so that the conditions or indications for which the visual examinations are performed can be detected."

Staff Evaluation of RR-17:

To comply with the examination of containment required by 10 CFR 50.55a(g)(6)(ii)(B), licensees must perform visual examinations on Class MC and metallic liners of Class CC concrete components per the requirements of IWE, and visual examinations on Class CC concrete components in accordance with Subsection IWL of ASME Section XI. The Code provides for remote examination of surface conditions per IWL-2510.

The NRC staff finds that the relief request is technically inadequate to support the licensee's request because the licensee has not clearly identified the requirements from which relief is requested. Furthermore, the relief request makes no commitments regarding how the alternative provisions (minimum illumination and maximum examination distance) will be controlled. The staff does not consider the Code requirements to perform direct visual examinations, or remote inspections, to be a hardship; and relief request No. RR-17, as written, does not provide sufficient information for the staff to determine that the proposed alternatives are acceptable. Therefore, Relief Request No. RR-17 is denied.

3.0 CONCLUSION

The NRC staff has evaluated the licensee's August 4, 1998 submittals for the Susquehanna Steam Electric Station, Units 1 and 2. Pursuant to 10 CFR 50.55a(a)(3)(ii), it is concluded that for Relief Request Nos. RR-14, RR-15, and RR-16, compliance with Code requirements will result in hardship or unusual difficulty without a compensating increase in the level of quality and safety, and therefore, the proposed alternatives are authorized for the first 10-year primary containment inservice inspection program interval.

For denied Relief Request RR-17, the licensee must take actions to comply with the Code requirements or seek review and approval of a revised relief request which: (1) clearly communicates the requirements from which relief is requested, and (2) provides sufficient information for the staff to determine that the proposed alternatives are acceptable.

A detailed summary of the Relief Requests addressed by this SE is provided in the attached table.

Attachment: Table 1, Summary of Relief Requests

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Date: March 25, 1999

Susquehana Steam Electric Station
First 10-Year Containment ISI Interval

Table 1
SUMMARY OF RELIEF REQUESTS

Relief Request Number	System or Component	Exam Category	Item No.	Volume of Area to be Examined	Required Method	Licensee Proposed Alternative	Relief Request Status
RR14	Seals and Gaskets of Code Class MC Components	IWE, E-D	E5.10 E5.20	100% seals and gaskets on airlocks, hatches, and other devices required for leak tight integrity	Visual, VT-3	Leak tight integrity of seals and gaskets to be verified by the approved 10 CFR 50, Appendix J testing	Authorized
RR15	Repairs of ASME Code Class MC	IWE Class MC, E-C	E4.10 E4.11 E4.12	100% of surface areas identified in IWE-1240 100% of minimum wall thickness	Visual, VT-1 Volumetric	Repairs of components will be performed in accordance with IWA-4000 without successive examinations in accordance with IWE-2420 (b) and (c)	Authorized
RR16	Bolted Connections	ASME Code Class MC	E8.20	All bolted connections that have not been disassembled and reassembled during the inspection interval	Bolt torque or tension test	Leak tight integrity of bolted connections not disassemled during interval will be verified via App. J, Type B test and VT-1 visual examination of surfaces in accordance with Examination Category E-G, Item E8.10	Authorized
RR17	Concrete Visual and remote examination	C-C, IWA-2210, IWL-2310	L1.11 L1.12	Examination of all surface areas and suspect areas	VT-1C and VT-3C visual examination	As permitted for MC, the minimum and maximum examination distances will be controlled so that the conditions or indications for which the visual examinations are performed can be detected	Denied

Attachment