



Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381-2000

JUL 0 8 1999

10 CFR 50.55a(a)(3)(i) and(ii)

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555

Gentlemen:

In the Matter of ) Docket No. 50-390  
Tennessee Valley Authority )

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 - AMERICAN SOCIETY OF  
MECHANICAL ENGINEERS (ASME) - CODE CASE N-605, AND  
EXAMINATIONS OF SEALS AND GASKETS, VT-2 VISUAL EXAMINATIONS  
DURING APPENDIX J TESTING, METAL CONTAINMENT AREAS THAT HAVE  
BEEN REPAIRED, AND BOLTED CONNECTIONS - REQUEST FOR RELIEF

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ADP

The purpose of this letter is to request relief from specific requirements of ASME Section XI, Subsection IWE of the 1992 Edition, 1992 Addenda. Subsection IWE applies to Code Class MC (metal containment) pressure retaining components and metallic shell and penetration liners of Code Class CC (concrete containment) pressure retaining components and their integral attachments.

TVA seeks relief from the requirements described below. A detailed discussion and justification for each relief request are included in Enclosures 1 through 5.

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**CISI-1:** Requests relief in accordance with 10 CFR 50.55a(a)(3)(ii) to not perform VT-3 visual examinations of seals and gaskets of Class MC components.

**CISI-2:** Requests relief in accordance with 10 CFR 50.55a(a)(3)(i) to not perform VT-2 visual examinations for leakage during Appendix J leak rate tests following repair, replacement, or modification activities.

**CISI-3:** Requests relief in accordance with 10 CFR 50.55a(a)(3)(ii) to not perform successive examinations of metal containment areas that have been repaired and are acceptable for continued service.

**CISI-4:** Requests relief in accordance with 10 CFR 50.55a(a)(3)(ii) to not perform torque or tension tests of Class MC bolted connections which have not been disassembled.

**CISI-5:** Requests relief in accordance with 10 CFR 50.55a(a)(3)(ii) to utilize Code Case N-605 in lieu of Subsection IWE for examination requirements of areas requiring augmented examination in accordance with Subsection IWE.

There are existing precedents for these requests for relief. Requests CISI-1, -3, -4, and -5 are based on previously approved requests for Davis-Besse which were submitted by letter dated December 22, 1997. The NRC staff approved the Davis-Besse request for relief by letter dated June 30, 1998. Request CISI-2, "Leakage During Appendix J Testing" is consistent with a request by Davis-Besse which was denied by NRC. Additional information has been provided in this request to address NRC concerns.

TVA has determined that the proposed alternatives would provide an acceptable level of quality and safety.

TVA requests NRC review and approval of these relief requests so that the Containment Inservice Inspection plan revisions can be completed in time to support the implementation of Containment Inservice Inspections during the October 2000

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refueling outage. An NRC response is requested by April 1, 2000, in order to allow sufficient time to amend the inspection plans that implement this request.

If you should have any questions concerning this matter, please telephone me at (423) 365-1824 or Everett Whitaker at (423) 751-6369.

Sincerely,



P. L. Pace  
Manager, Licensing and  
Industry Affairs

Enclosures

cc (Enclosures)

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ENCLOSURE 1

WATTS BAR NUCLEAR PLANT UNIT 1  
REQUEST FOR RELIEF CISI-1

EXECUTIVE SUMMARY:

ASME Section XI, 1992 Edition, 1992 Addenda, Table IWE-2500-1, Examination Category E-D, requires a visual examination, VT-3, of containment seals and gaskets. Examination of most seals and gaskets require the joints to be disassembled. Note 1 in Examination Category E-D was modified in the 1992 Edition, 1993 Addenda, of ASME Section XI to state that sealed or gasket connections need not be disassembled solely for performance of examinations. However, without disassembly, most of the surface of the seals and gaskets would be inaccessible. Therefore, the examination would be meaningless.

When the airlocks, hatches, electrical penetrations, and flanged connections are tested in accordance with 10 CFR 50, Appendix J, degradation of the seal or gasket material would be revealed by an increase in the leakage rate. Corrective measures would be applied and the component retested. Repair or replacement of seals and gaskets is not subject to Code rules in accordance with Paragraph IWA-4111(b)(5) of the 1992 Edition, 1992 Addenda of ASME Section XI.

The visual examination of seals and gaskets in accordance with Subsection IWE is a burden without a compensating increase in safety or quality.

The requirement to examine seals and gaskets has been removed in the 1998 Edition of ASME Section XI.

Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii) it is requested that relief be granted.

UNITS: Watts Bar Unit 1

SYSTEM: Containment System

ASME CODE CLASS: MC

ASME SECTION XI CODE EDITION/ADDENDA: 1992 Edition, 1992 Addenda

CODE TABLE: IWE-2500-1

EXAMINATION CATEGORY: E-D, Seals, Gaskets, And Moisture Barriers

ENCLOSURE 1

WATTS BAR NUCLEAR PLANT UNIT 1  
REQUEST FOR RELIEF CISI-1

EXAMINATION ITEM NUMBER: E5.10, Seals, and E5.20, Gaskets

CODE REQUIREMENT(S):

Table IWE-2500-1, Examination Category E-D, Item Numbers E5.10 and E5.20, requires seals and gaskets on airlocks, hatches, and other devices to be VT-3 visually examined once each inspection interval to assure containment leak-tight integrity.

CODE REQUIREMENT FROM WHICH RELIEF IS REQUESTED:

Relief is requested from performing the visual examination, VT-3, on the above identified metal containment seals and gaskets.

SYSTEM/COMPONENT(S) FOR WHICH RELIEF IS REQUESTED:

Seals and gaskets of Class MC pressure retaining components, Examination Category E-D, Item Numbers E5.10 and E5.20 of Table IWE-2500-1.

BASIS FOR RELIEF:

The design configuration of the connections which include seals and gaskets precludes visual examination of the seals and gaskets without disassembly of the connection. Testing the seals and gaskets in accordance with 10 CFR 50, Appendix J, provides adequate assurance of the leak-tight integrity of the seals and gaskets.

JUSTIFICATION FOR THE GRANTING OF RELIEF:

10 CFR 50.55a was amended in the Federal Register (61FR41303) to require the use of the 1992 Edition, 1992 Addenda, of ASME Section XI when performing containment examinations. These examinations include visual examinations of seals and gaskets. The penetrations discussed below contain seals and gaskets:

Electrical Penetrations

Electrical penetrations use a header plate(s), or header plate canister assembly, welded to the containment penetration nozzle. Modules through which electrical conductors pass are installed in the header plate(s).

ENCLOSURE 1

WATTS BAR NUCLEAR PLANT UNIT 1  
REQUEST FOR RELIEF CISI-1

The electrical penetrations presently installed at Watts Bar are manufactured by Conax. Penetrations manufactured by Conax use a set of compression fittings and may include sealant compounds and/or o-rings. The Conax penetration seals are completely inaccessible without disconnecting cabling and removal of the modules.

Containment Personnel Airlocks(2), Equipment Hatch,  
and Miscellaneous Blind Flanges

The personnel airlock doors utilize an inner and outer door with double sets of gaskets and knife-edges to ensure leak tight integrity. These airlocks also contain other gaskets and seals for items such as the handwheel shaft seals, electrical penetrations, blind flanges, and equalizing pressure connections which require disassembly to gain access to the gaskets and seals. The equipment hatch consists of a single hatch cover. The equipment hatch cover and all miscellaneous blind flanges utilize double o-ring seals.

Seals and gaskets receive a 10 CFR 50, Appendix J, Type B test. As noted in 10 CFR 50, Appendix J, the purpose of the Type B test is to measure leakage of containment penetrations whose design incorporates resilient seals, gaskets, or sealant compounds or flexible metal seal assemblies. Examination of seals and gaskets require the joints, which are proven adequate through Appendix J testing, to be disassembled. For electrical penetrations, this would involve performance of an Appendix J, Type B test prior to disassembly; de-termination of cables at electrical penetrations if enough cable slack is not available; disassembly of the joint (if designed to permit disassembly); removal and VT-3 visual examination of the seals and gaskets; reassembly of the joint; re-termination of the cables if necessary; post maintenance testing of the cables; and performance of an Appendix J, Type B test upon final assembly. This imposes the risk that equipment could be damaged. In addition, a VT-3 examination does not ensure that these items, when reassembled, will not leak.

Note 1 in Examination Category E-D was modified in the 1992 Edition, 1993 Addenda, of ASME Section XI to state that sealed or gasket connections need not be disassembled solely for performance of examinations. However, without

ENCLOSURE 1

WATTS BAR NUCLEAR PLANT UNIT 1  
REQUEST FOR RELIEF CISI-1

disassembly, in most cases all of the surface of the seals and gaskets would be inaccessible.

In addition to the testing conducted prior to disassembly and after reassembly, the containment personnel airlocks receive a Type B test within seven days after each opening. Containment entries are normally made each week. For periods of multiple containment entries where the airlock doors are routinely used for access more frequently than once every seven days, door seals may be tested once every thirty days during this time period. The airlock door gaskets are visually inspected as a normal surveillance practice at least once every thirty months. Since the Type B tests assure the leak tight integrity of primary containment, the performance of a VT-3 visual examination would not increase the level of safety or quality.

For the equipment hatch penetration, which is routinely disassembled, a Type B test is required prior to disassembly and upon final assembly. Since the Type B tests assure the leak tight integrity of primary containment, the performance of a VT-3 visual examination would not increase the level of safety or quality. In addition, when the hatch is disassembled, the o-ring seals are visually inspected as a normal maintenance practice.

For the blind flange penetrations, should the connection(s) be disassembled a Type B test is required prior to disassembly and upon final assembly prior to startup. Since the Type B tests assure the leak tight integrity of primary containment, the performance of the VT-3 visual examination would not increase the level of safety or quality.

When the airlocks, hatch, and blind flanges containing these seals and gaskets are tested in accordance with 10 CFR 50, Appendix J, degradation of the seal or gasket material would be revealed by an increase in the leakage rate. Corrective measures would be applied and the component retested. Repair or replacement of seals and gaskets is not subject to ASME Section XI rules in accordance with Paragraph IWA-4111(b)(5).

Overall containment leakage is verified by 10 CFR 50, Appendix J, Type A tests. Although the Type A test does not verify individual penetration leakage, it does provide additional assurance that there is no significant leakage through the containment pressure boundary, which includes all sealed penetrations.

ENCLOSURE 1

WATTS BAR NUCLEAR PLANT UNIT 1  
REQUEST FOR RELIEF CISI-1

The visual examination of seals and gaskets in accordance with Table IWE-2500-1, Examination Category E-D, Item Numbers E5.10 and E5.20, is a burden without any compensating increase in the level of safety or quality. Compliance with the specified requirements of performing a VT-3 visual examination of seals and gaskets would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Testing the seals and gaskets in accordance with 10 CFR 50, Appendix J provides adequate assurance of the leak-tight integrity of the seals and gaskets.

The requirement to examine seals and gaskets has been removed in the 1998 Edition of ASME Section XI.

Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), it is requested that relief be granted.

**ALTERNATIVE EXAMINATION(S):**

The leak-tightness of seals and gaskets is tested in accordance with 10 CFR 50, Appendix J. Type B testing is performed at least once each inservice inspection interval as required by 10 CFR 50, Appendix J, in addition to the Type B tests performed prior to disassembly and after re-assembly. Appendix J, Type A tests provide additional assurance that there is no significant leakage through the containment pressure boundary. No additional alternatives are proposed.

**IMPLEMENTATION SCHEDULE:**

Watts Bar Nuclear Plant first inspection interval for Subsection IWE.

WATTS BAR NUCLEAR PLANT UNIT 1  
REQUEST FOR RELIEF CISI-2EXECUTIVE SUMMARY:

Paragraph IWE-5240 of the 1992 Edition, 1992 Addenda, of ASME Section XI requires a visual examination, VT-2, following repair, modification, or replacement of containments. VT-2 visual examinations are conducted to detect evidence of leakage from pressure retaining components, with or without leakage collection systems, during the conduct of a system pressure test.

These VT-2 visual examinations are principally performed to locate water or steam leaks from pressure retaining components. VT-2 examination for evidence of air leakage does not provide effective detection of leakage. Table IWE-2500-1, Examination Category E-P, requires 10 CFR 50, Appendix J testing for all containment pressure retaining components. Appendix J provides requirements for testing as well as acceptable leakage criteria. Additionally, 10 CFR 50.55a(b)(2)(x)(E) requires a General Visual examination of the containment, as required by Subsection IWE, be performed each period. This examination would identify structural degradation that may contribute to leakage. Repairs and replacements, including modifications, must be performed in accordance with Article IWA-4000, which provides additional assurance of structural integrity of the containment. Performance of a VT-2 visual examination in addition to these requirements would not provide additional assurance of detection of containment pressure boundary leakage.

Therefore, pursuant to 10 CFR 50.55a(a)(3)(i) it is requested that relief be granted.

UNITS: Watts Bar Unit 1

SYSTEM: Containment System

ASME CODE CLASS: MC and CC

ASME SECTION XI CODE EDITION/ADDENDA: 1992 Edition, 1992 Addenda

CODE TABLE: IWE-2500-1

EXAMINATION CATEGORY: E-P, All Pressure Retaining Components

ENCLOSURE 2

WATTS BAR NUCLEAR PLANT UNIT 1  
REQUEST FOR RELIEF CISI-2

EXAMINATION ITEM NUMBER: E9.10, Containment Vessel, Pressure Retaining Boundary

CODE REQUIREMENT(S) :

Table IWE-2500-1, Examination Category E-P, Item Number E9.10, requires a system leakage test be performed for each repair, modification, or replacement. Paragraph IWE-5240 states that the requirements of Paragraph IWA-5240 are applicable for visual examinations performed following repair, modification, or replacement. Paragraph IWA-5240 provides requirements for the performance of a VT-2 visual examination for the detection of leakage.

CODE REQUIREMENT FROM WHICH RELIEF IS REQUESTED:

Relief is requested from performing the VT-2 visual examination of Paragraph IWA-5240 in connection with system pressure testing following repair, modification, or replacement as required by Paragraph IWE-5240.

SYSTEM/COMPONENT(S) FOR WHICH RELIEF IS REQUESTED:

All Class MC components and metallic shell and penetration liners of Class CC components and their integral attachments which require repair, modification, or replacement and are subject to the system pressure tests of Table IWE-2500-1, Examination Category E-P, Item Number E9.10 and Article IWE-5000.

BASIS FOR RELIEF:

Table IWE-2500-1, Examination Category E-P, Item Number E9.10, requires that a leakage test be performed in accordance with 10 CFR 50, Appendix J following each repair, modification, or replacement. Performance of the Appendix J testing would detect any leakage which may exist in the containment pressure retaining boundary. In addition, the requirements of Article IWA-4000 must be met following repairs and replacements, including modifications. Performance of a VT-2 visual examination, as required by Paragraph IWE-5240, does not provide additional assurance of detection of leakage.

ENCLOSURE 2

WATTS BAR NUCLEAR PLANT UNIT 1  
REQUEST FOR RELIEF CISI-2

JUSTIFICATION FOR THE GRANTING OF RELIEF:

10 CFR 50.55a was amended in the Federal Register (61FR41303) to require the use of the 1992 Edition, 1992 Addenda, of ASME Section XI when performing containment examinations. Paragraph IWE-5210 states that except as noted within Paragraph IWE-5240, the requirements of Article IWA-5000 are not applicable to Class MC or Class CC components. Paragraph IWE-5240 states that the requirements of Paragraph IWA-5240 (corrected from IWA-5246 to IWA-5240 in the 1993 Addenda) for visual examinations are applicable. Paragraph IWA-5240 identifies requirements for performance of a VT-2 visual examination. VT-2 visual examinations are conducted to detect evidence of leakage from pressure retaining components, with or without leakage collection systems, during the conduct of a system pressure test. In addition, personnel performing VT-2 visual examinations are required to be qualified in accordance with Subarticle IWA-2300 of ASME Section XI.

Table IWE-2500-1, Examination Category E-P, Item Number E9.10, identifies the examination method of 10 CFR 50, Appendix J and does not specifically identify a VT-2 visual examination. 10 CFR 50, Appendix J provides requirements for testing as well as acceptable leakage criteria. These tests are performed by qualified Appendix J test personnel and utilize calibrated equipment to determine leak rate acceptability. Additionally, 10 CFR 50.55a(b)(2)(x)(E) requires a General Visual examination of the containment each period that would identify structural degradation that may contribute to leakage.

Repairs and replacements, including modifications, to the containment pressure retaining boundary and to integral attachments must be performed in accordance with Article IWA-4000. This article requires, among other things, preparation of a repair and replacement plan; requires repairs and installation of replacements, including performance of nondestructive examinations, to be performed in accordance with the original edition or later editions of the Construction Code or Section III; and requires performance of preservice inspections in accordance with Subsection IWE. Repairs and replacements of pressure retaining MC components and their integral attachments at Watts Bar Nuclear Plant are performed in accordance with the Tennessee Valley Authority Repair and Replacement Program. This program specifies the repair

ENCLOSURE 2

WATTS BAR NUCLEAR PLANT UNIT 1  
REQUEST FOR RELIEF CISI-2

methods and nondestructive examinations necessary to ensure that the original quality and construction requirements of the containment vessel are met.

Performance of the Appendix J testing will detect leakage which may exist in the containment pressure retaining boundary. Performance of the General Visual examination and compliance with Article IWA-4000 will provide added assurance of the structural integrity of the containment pressure retaining boundary. Performance of a VT-2 visual examination in addition to these requirements would not provide additional assurance of detection of containment pressure boundary leakage.

Pressure testing in accordance with 10 CFR 50, Appendix J, provides an adequate level of quality.

Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), it is requested that relief be granted.

ALTERNATIVE EXAMINATION(S):

Testing will be conducted in accordance with 10 CFR 50, Appendix J, in lieu of performing the requirements of Paragraph IWE-5240. Repair and replacement activities, including nondestructive examinations, will be performed in accordance with IWA-4000. No additional alternatives are proposed.

IMPLEMENTATION SCHEDULE:

Watts Bar Nuclear Plant first inspection interval for IWE.

WATTS BAR NUCLEAR PLANT UNIT 1  
REQUEST FOR RELIEF CISI-3

EXECUTIVE SUMMARY:

Paragraphs IWE-2420(b) and IWE-2420(c) of the 1992 Edition, 1992 Addenda, of ASME Section XI require that when component examination results require evaluation of flaws, evaluation of areas of degradation, or repairs in accordance with Article IWE-3000, and the component is found to be acceptable for continued service, the areas containing such flaws, degradation, or repairs shall be reexamined during the next inspection period listed in the schedule of the inspection program of Paragraph IWE-2411 or Paragraph IWE-2412, in accordance with Table IWE-2500-1, Examination Category E-C.

The purpose of a repair is to restore the component to an acceptable condition for continued service. Furthermore, if the repair area is subject to accelerated degradation, it would require augmented examination in accordance with Table IWE-2500-1, Examination Category E-C. The successive examination of repaired areas in accordance with Paragraphs IWE-2420(b) and IWE-2420(c) constitutes a burden without a compensating increase in quality or safety.

Paragraphs IWB-2420(b), IWC-2420(b), and IWD-2420(b) for Class 1, 2, and 3 components, respectively, do not require a repaired component be subject to successive examination requirements. Additionally, the requirement to perform successive examinations of repaired areas in accordance with Paragraphs IWE-2420(b) and IWE-2420(c) has been removed in the 1998 Edition of ASME Section XI.

The requirement to perform successive examinations of repaired areas in accordance with Subsection IWE is a burden without a compensating increase in safety or quality.

Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), it is requested that relief be granted.

UNITS: Watts Bar Unit 1

SYSTEM: Containment System

ASME CODE CLASS: MC and CC

ASME SECTION XI CODE EDITION/ADDENDA: 1992 Edition, 1992 Addenda

ENCLOSURE 3

WATTS BAR NUCLEAR PLANT UNIT 1  
REQUEST FOR RELIEF CISI-3

CODE TABLE: NA

EXAMINATION CATEGORY: NA

EXAMINATION ITEM NUMBER: NA

CODE REQUIREMENT(S):

Paragraph IWE-2420(b) requires that when component examination results require evaluation of flaws, evaluation of areas of degradation, or repairs in accordance with Article IWE-3000, and the component is found to be acceptable for continued service, the areas containing such flaws, degradation, or repairs shall be reexamined during the next inspection period listed in the schedule of the inspection program of Paragraph IWE-2411 or Paragraph IWE-2412, in accordance with Table IWE-2500-1, Examination Category E-C. In accordance with Paragraph IWE-2420(c), when the reexaminations required by Paragraph IWE-2420(b) reveal that the flaws, areas of degradation, or repairs remain essentially unchanged for three consecutive inspection periods, the areas containing such flaws, degradation, or repairs no longer require augmented examination in accordance with Table IWE-2500-1, Examination Category E-C.

CODE REQUIREMENT FROM WHICH RELIEF IS REQUESTED:

Relief is requested from the requirement of Paragraphs IWE-2420(b) and IWE-2420(c) to perform successive examination of repaired areas.

SYSTEM/COMPONENT(S) FOR WHICH RELIEF IS REQUESTED:

All Class MC components and metallic shell and penetration liners of Class CC components and their integral attachments which require repairs and are found to be acceptable in accordance with Article IWE-3000 for continued service subsequent to the repairs.

BASIS FOR RELIEF:

Examination results, which detect flaws or areas of degradation which exceed the acceptance criteria of IWE-3000, require engineering evaluation, repair, or replacement of the flaw or areas of degradation. Paragraphs IWE-2420(b) and IWE-2420(c) require performance of successive

ENCLOSURE 3

WATTS BAR NUCLEAR PLANT UNIT 1  
REQUEST FOR RELIEF CISI-3

examinations for flaws or areas of degradation accepted for continued service based on engineering evaluation or repair. The purpose of a repair is to restore the component to an acceptable condition for continued service in accordance with the acceptance standards of Article IWE-3000. If the repair has restored the component to an acceptable condition, successive examinations are not warranted.

JUSTIFICATION FOR THE GRANTING OF RELIEF:

10 CFR 50.55a was amended in the Federal Register (61FR41303) to require the use of the 1992 Edition, 1992 Addenda, of ASME Section XI when performing containment examinations. Examination results, which detect flaws or areas of degradation which exceed the acceptance criteria of Article IWE-3000, require engineering evaluation, repair, or replacement of the flaw or areas of degradation. The purpose of a repair is to restore the component to an acceptable condition for continued service in accordance with the acceptance standards of Article IWE-3000. Paragraph IWA-4150 requires the owner to conduct an evaluation of the suitability of the repair including consideration of the cause of failure.

If a repair has restored the component to an acceptable condition, successive examinations are not warranted. If the repair was not suitable, then the repair does not meet code requirements and the component is not acceptable for continued service. Paragraphs IWB-2420(b), IWC-2420(b), and Paragraph IWD-2420(b) for Class 1, 2, and 3 components, respectively, do not require a repair to be subject to successive examination requirements. Furthermore, if the repair area is subject to accelerated degradation, it would require augmented examination in accordance with Table IWE-2500-1, Examination Category E-C.

In SECY 96-80, "Issuance of Final Amendment to 10 CFR Section 50.55a to Incorporate by Reference the ASME Boiler and Pressure Vessel Code (ASME Code), Section XI, Division 1, Subsection IWE and Subsection IWL", dated April 17, 1996, the response to Subsection IWE comment 3.3 states, "The purpose of IWE-2420(b) is to manage components found to be acceptable for continued service (meaning no repair or replacement at this time) as an Examination Category E-C component... If the component had been repaired or replaced, then the more frequent examination would not be needed."

ENCLOSURE 3

WATTS BAR NUCLEAR PLANT UNIT 1  
REQUEST FOR RELIEF CISI-3

The successive examination of repairs in accordance with Paragraphs IWE-2420(b) and IWE-2420(c) constitutes a burden without a compensating increase in quality or safety.

The requirement to perform successive examinations of repaired areas has been removed from Paragraphs IWE-2420(b) and IWE-2420(c) in the 1998 Edition of ASME Section XI.

Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), it is requested that relief be granted.

**ALTERNATE EXAMINATION(S):**

Successive examinations in accordance with Paragraphs IWE-2420(b) and IWE-2420(c) will not be required for areas repaired in accordance with Article IWA-4000. Successive examinations will be performed in accordance with Paragraphs IWE-2420(b) and IWE-2420(c) for components whose examination results detect flaws or areas of degradation that exceed the acceptance criteria of IWE-3000 and are found acceptable for continued service without repair based on an engineering evaluation.

**IMPLEMENTATION SCHEDULE:**

Watts Bar Nuclear Plant first inspection interval for Subsection IWE.

ENCLOSURE 4

WATTS BAR NUCLEAR PLANT UNIT 1  
REQUEST FOR RELIEF CISI-4

EXECUTIVE SUMMARY:

Table IWE-2500-1, Examination Category E-G, Item Number E8.20, of the 1992 Edition, 1992 Addenda, of ASME Section XI requires torque or tension testing on pressure retaining bolted connections that have not been disassembled and reassembled during the inspection interval. Determination of the torque or tension value requires that the bolting be un-torqued and then re-torqued or re-tensioned. This activity is considered maintenance and therefore would require a 10 CFR 50, Appendix J, Type B test prior to un-torquing and following re-torquing the bolting. The performance of the Type B test itself proves that the bolt torque or tension remains adequate to provide a leak rate that is within acceptable limits. In addition, exposed surfaces of bolted connections are VT-1 visually examined once each inspection interval in accordance with requirements of Table IWE-2500-1, Examination Category E-G, Item No. E8.10. Appendix J testing and visual examination is adequate to demonstrate that the design function is met. Bolt torque or tension testing is not required on any other Class 1, 2, or 3 bolted connections or their supports as part of the ASME Section XI Inservice Inspection Program.

Overall containment leakage is verified by 10 CFR 50, Appendix J, Type A tests. Although the Type A test does not verify individual penetration leakage, it does provide additional assurance that there is no significant leakage through the containment pressure boundary, which includes all bolted connections.

The requirement to perform a torque or tension test on pressure retaining bolted connections which have not been disassembled and reassembled during the inspection interval in accordance with Table IWE-2500-1 is a burden without a compensating increase in safety or quality.

The requirement for torque or tension testing on pressure retaining bolted connections has been removed in the 1998 Edition of ASME Section XI.

Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), it is requested that relief be granted.

UNITS: Watts Bar Unit 1

ENCLOSURE 4

WATTS BAR NUCLEAR PLANT UNIT 1  
REQUEST FOR RELIEF CISI-4

SYSTEM: Containment System

ASME CODE CLASS: MC

ASME SECTION XI CODE EDITION/ADDENDA: 1992 Edition, 1992  
Addenda

CODE TABLE: IWE-2500-1

EXAMINATION CATEGORY: E-G, Pressure Retaining Bolting

EXAMINATION ITEM NUMBER: E8.20, Bolted Connections

CODE REQUIREMENT(S):

Table IWE-2500-1, Examination Category E-G, Item Number E8.20, requires a bolt torque or tension test for bolted connections which have not been disassembled and reassembled during the inspection interval. It is permissible for the torque or tension test to be deferred to the end of the inspection interval.

CODE REQUIREMENT FROM WHICH RELIEF IS REQUESTED:

Relief is requested from performing a bolt torque or tension test on bolted connections that have not been disassembled and reassembled during the inspection interval as required by Table IWE-2500-1, Examination Category E-G, Item Number E8.20.

SYSTEMS/COMPONENTS FOR WHICH RELIEF IS REQUESTED:

Code Class MC pressure retaining bolting subject to the examination requirements of Table IWE-2500-1, Examination Category E-G, Item Number E8.20.

BASIS FOR RELIEF:

Table IWE-2500, Examination Category E-G, Item Number E8.20, requires bolt torque or tension testing on bolted connections that have not been disassembled and reassembled during the inspection interval. Performance of required Appendix J testing will detect containment pressure retaining boundary leakage. In addition, a VT-1 examination is performed each inspection interval on pressure retaining bolting in accordance with Item Number E8.10. Performance of a bolt torque or tension test will not provide additional

ENCLOSURE 4

WATTS BAR NUCLEAR PLANT UNIT 1  
REQUEST FOR RELIEF CISI-4

assurance of detection of leakage or of structural integrity.

JUSTIFICATION FOR THE GRANTING OF RELIEF:

10CFR50.55a was amended in the Federal Register (61FR41303) to require the use of the 1992 Edition, 1992 Addenda, of ASME Section XI when performing containment examinations. Table IWE-2500-1, Examination Category E-G, Item Number E8.20, requires bolt torque or tension testing on bolted connections that have not been disassembled and reassembled during the inspection interval. Determination of the torque or tension value would require that the bolting be un-torqued and then re-torqued or re-tensioned. This activity is considered a maintenance activity which potentially affects the sealing characteristics/ability of the penetration and therefore would require a 10 CFR 50, Appendix J, Type B test prior to un-torquing and following re-torquing the bolting. The performance of the Type B test itself proves that the bolt torque or tension remains adequate to provide a leak rate that is within acceptable limits. In addition, exposed surfaces of bolted connections are VT-1 visually examined once each inspection interval in accordance with requirements of Table IWE-2500-1, Examination Category E-G, Item No. E8.10. Appendix J testing and the VT-1 visual examination are adequate to demonstrate that design function is met. Torque or tension testing is not required on any other Class 1, 2, or 3 bolted connections or their supports as part of the ASME Section XI Inservice Inspection Program.

Overall containment leakage is verified by 10 CFR 50, Appendix J, Type A tests. Although the Type A test does not verify individual bolted connections, it does provide additional assurance that there is no significant leakage through the containment pressure boundary.

Un-torquing and subsequent re-torquing of bolted connections which are verified not to experience unacceptable leakage through 10 CFR 50, Appendix J, Type B testing, results in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The requirement to perform bolt torque or tension tests has been removed in the 1998 Edition of ASME Section XI.

ENCLOSURE 4

WATTS BAR NUCLEAR PLANT UNIT 1  
REQUEST FOR RELIEF CISI-4

Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), it is requested that relief be granted.

ALTERNATE EXAMINATION(S):

The following examinations and tests required by Subsection IWE and 10 CFR 50, Appendix J ensure the structural integrity and the leak-tightness of Class MC pressure retaining bolting; and, therefore, no additional alternative examinations are proposed:

- (1) Exposed surfaces of bolted connections will be VT-1 visually examined once each inspection interval in accordance with requirements of Table IWE-2500-1, Examination Category E-G, Item No. E8.10,
- (2) Bolted connections will meet the pressure test requirements of Table IWE-2500-1, Examination Category E-P, Item E9.40, and
- (3) Overall containment leakage will be verified by 10 CFR 50, Appendix J, Type A tests.

IMPLEMENTATION SCHEDULE:

Watts Bar Nuclear Plant first inspection interval for Subsection IWE.

WATTS BAR NUCLEAR PLANT UNIT 1  
REQUEST FOR RELIEF CISI-5EXECUTIVE SUMMARY:

Paragraph IWE-1241 of ASME Section XI, 1992 Edition, 1992 Addenda, requires the augmented examinations of Table IWE-2500-1, Examination Category E-C, be performed on containment surface areas likely to experience accelerated degradation and aging. Subarticle IWE-2500(c)(1) requires that areas subject to augmented examinations that are accessible from both sides be VT-1 visually examined. Subarticle IWE-2500(c)(2) requires that areas subject to augmented examinations that are accessible from only one side be examined for wall thinning using an ultrasonic (UT) thickness measurement method. Subarticle IWE-2500(c)(3) requires that when augmented UT thickness measurements are performed that the measurements be taken in one foot square grids. Subarticle IWE-2500(c)(4) requires the minimum wall thickness within each grid be determined and marked such that periodic reexamination of that location can be performed. This provides for monitoring of a point that may not be the most susceptible to accelerated degradation and requires taking numerous ultrasonic thickness readings within a grid which may not have exhibited degradation.

Code Case N-605, "Alternative to the Requirements of IWE-2500(c) for Augmented Examination of Surface Areas," provides for UT thickness measurements to be taken at grid line intersections (see Attachment E5-1). Code Case N-605 also permits variations in grid line spacing, provides a sampling plan for performing the UT thickness measurements, and provides a plan for sample expansion for areas exhibiting degradation. Code Case N-605 incorporates the requirements of Subarticle IWE-2500(c)(1) for performance of VT-1 visual examinations.

Taking numerous UT thickness readings within a grid which had not exhibited degradation results in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The use of Code Case N-605 to determine examination requirements for VT-1 visual examinations and UT thickness measurements of areas requiring augmented examinations provides for an acceptable level of quality and safety. The requirements of Code Case N-605 have been incorporated in the 1998 Edition of ASME Section XI.

Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), it is requested that relief be granted.

ENCLOSURE 5

WATTS BAR NUCLEAR PLANT UNIT 1  
REQUEST FOR RELIEF CISI-5

UNITS: Watts Bar Unit 1

SYSTEM: Containment System

ASME CODE CLASS: MC

ASME SECTION XI CODE EDITION/ADDENDA: 1992 Edition, 1992  
Addenda

CODE TABLE: IWE-2500-1

EXAMINATION CATEGORY: E-C, Containment Surfaces Requiring  
Augmented Examination

EXAMINATION ITEM NUMBER: E4.12, Surface Area Grid, Minimum  
Wall Thickness Location

CODE REQUIREMENTS

Subarticle IWE-2500(c) (1) requires that areas subject to augmented examinations that are accessible from both sides be VT-1 visually examined. Subarticle IWE-2500(c) (2) requires that areas subject to augmented examinations that are accessible from only one side be examined for wall thinning using a UT thickness measurement method. Subarticle IWE-2500(c) (3) requires one-foot square grids be used when UT thickness measurements are performed on augmented examination surface areas. The number and location of the grids is determined by the Owner. Subarticle IWE-2500(c) (4) requires the minimum wall thickness within each grid be determined.

CODE REQUIREMENTS FROM WHICH RELIEF IS REQUESTED

Relief is requested from using one-foot square grids for augmented examination areas in accordance with Subarticle IWE-2500(c) (3) and the requirement to determine the minimum wall thickness within each grid in accordance with Subarticle IWE-2500(c) (4).

SYSTEM/COMPONENT(S) FOR WHICH RELIEF IS REQUESTED

Containment surface areas subject to augmented examination in accordance with Subarticle IWE-1240.

WATTS BAR NUCLEAR PLANT UNIT 1  
REQUEST FOR RELIEF CISI-5

BASIS FOR RELIEF

Subarticles IWE-2500(c)(3) and IWE-2500(c)(4) require that the minimum thickness within each one-foot square grid of surface areas requiring augmented UT thickness measurements be marked such that periodic reexamination of that location can be performed. This provides for monitoring of a point that may not be the most susceptible to accelerated degradation and requires taking numerous ultrasonic thickness readings within a grid which may not have exhibited degradation. Code Case N-605 provides for UT thickness measurements to be taken at grid line intersections. Code Case N-605 also: permits variations in grid line spacing; provides a sampling plan for performing the UT thickness measurements; and provides a plan for sample expansion for areas exhibiting degradation.

JUSTIFICATION FOR THE GRANTING OF RELIEF

10CFR50.55a was amended in the Federal Register (61FR41303) to require the use of the 1992 Edition, 1992 Addenda, of ASME Section XI when performing containment examinations. Paragraph IWE-1241 requires the augmented examinations of Table IWE-2500-1, Examination Category E-C, be performed on containment surface areas likely to experience accelerated degradation and aging. Subarticle IWE-2500(c)(1) requires that areas subject to augmented examinations that are accessible from both sides be VT-1 visually examined. Subarticle IWE-2500(c)(2) requires that areas subject to augmented examinations that are accessible from only one side be examined for wall thinning using a UT thickness measurement method. Subarticles IWE-2500(c)(3) and IWE-2500(c)(4) require that the minimum thickness within each one foot square grid of surface areas requiring augmented UT thickness measurements be marked such that periodic reexamination of that location can be performed. Thickness readings are point readings. Numerous readings are necessary to identify the minimum thickness within each grid. This only identifies the thinnest area. Periodic examination of the minimum thickness point only monitors that point and may not be the area that is the most susceptible to accelerated degradation.

Code Case N-605 provides a proposed alternative to the one-foot square grid area required by IWE-2500(c)(3). Code Case N-605 requires examination at the grid line intersections.

ENCLOSURE 5

WATTS BAR NUCLEAR PLANT UNIT 1  
REQUEST FOR RELIEF CISI-5

The grid line intersections may not exceed 12 inches and need not be less than 2 inches. For a sample area of 50 square feet, Code Case N-605 requires a minimum of 100 locations be monitored. For a sample area of 50 square feet, Subarticle IWE-2500(c)(3) would require only 50 locations be monitored. In this instance, utilizing Code Case N-605 monitors more locations than required by Subarticle IWE-2500(c)(3). For sample areas greater than 100 square feet, Code Case N-605 requires that sufficient points be monitored to ensure at least a 95% confidence level that the thickness of the base metal is reduced by no more than 10% of the nominal plate thickness at 95% of the grid line intersections.

Code Case N-605 requires additional examinations when any measurements reveal wall thickness is reduced by more than 10% of the nominal plate thickness. For all UT thickness measurement areas, should the measurements at a grid line intersection reveal that the base material is reduced by more than 10% of the nominal plate thickness, Code Case N-605 requires the minimum wall thickness within each adjoining grid be determined. This is similar to the examination requirements of Subarticle IWE-2500(c)(4) except that Code Case N-605 focuses resources on areas which have exhibited degradation rather than areas which have not exhibited degradation.

Code Case N-605 also incorporates the requirements of Subarticle IWE-2500(c)(1) for performance of VT-1 visual examinations.

Taking numerous ultrasonic thickness readings within a grid which had not exhibited degradation results in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The requirements of Code Case N-605 have been incorporated into the 1998 Edition of ASME Section XI.

Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), it is requested that relief be granted.

ENCLOSURE 5

WATTS BAR NUCLEAR PLANT UNIT 1  
REQUEST FOR RELIEF CISI-5

ALTERNATIVE EXAMINATIONS:

Code Case N-605 will be used to determine examination requirements for VT-1 visual examinations and UT thickness measurements of areas requiring augmented examination.

IMPLEMENTATION SCHEDULE:

Watts Bar Nuclear Plant first inspection interval for Subsection IWE.

Attachment 1

Code Case N-605, "Alternative to the Requirements of IWE-2500(c) for Augmented Examination of Surface Areas" \*\*

\*\* Attachment 1 is a scanned image that has been converted to a WORD document using optical character recognition

## CASES OF ASME BOILER AND PRESSURE VESSEL CODE

Approval Date: March 2, 1998  
See Numeric Index for expiration  
and any reaffirmation dates.

**Case N-605****Alternative to the Requirements of IWE-2500(c)  
for Augmented Examination of Surface Areas  
Section XI, Division 1**

*Inquiry.* What alternative to the requirements of IWE-2500(c) may be used for augmented examination of surface areas?

*Reply:* It is the opinion of the Committee that the following requirements may be used as an alternative to the requirements of IWE-2500(c) for augmented examination of surface areas.

(a) Areas accessible from both sides shall be visually examined on both sides using VT-1 Visual Examination Method.

(b) Areas accessible from one side only shall be examined for wall thinning using an ultrasonic thickness measurement method in accordance with T-544.

(c) When ultrasonic thickness measurements are performed, grids shall be used. Grid line spacing shall comply with the requirements of Table -2500-2. The number and location of the grids shall be determined by the Owner. Locations of grid line intersections to be examined may be marked on containment surfaces in lieu of marking grid lines.

(d) Ultrasonic thickness measurements shall be performed to determine the minimum wall thicknesses at locations specified in Table -2500-2. Minimum wall thickness locations and locations of examined grid line intersections shall be marked such that periodic reexamination of these locations can be performed in accordance with the requirements of Table IWE-2500-1, Examination Category E-C.

CASE (continued)  
**N-605**

CASES OF ASME BOILER AND PRESSURE VESSEL CODE

**TABLE -2500-2**  
**ULTRASONIC THICKNESS MEASUREMENTS**  
**FOR AUGMENTED EXAMINATIONS**

Augmented Area Size (Contiguous)	Examination Requirements
≤100 square feet	100% of Grid Line Intersections <sup>1, 2, 3, 5, 6</sup>
>100 square feet	100% of Grid Line Intersections <sup>1, 2, 4, 5, 6</sup>

- (1) The number, location, and size of areas to be examined shall be determined by the Owner.
- (2) Grid line spacing shall not exceed 12 in. and need not be less than 2 in.
- (3) Grid line spacing shall be selected such that a minimum of 100 measurements are obtained from within each augmented examination area, unless this requires selecting a grid line spacing of less than 2 in.
- (4) In lieu of examining 100% of the grid line intersections within the augmented examination area, an alternate examination plan may be developed as follows:
  - (a) A sample area from within the augmented examination area may be selected for examination. The location and size of the sample area shall be determined by the Owner, but shall consist of areas subject to the most severe service conditions within the larger augmented examination area. 100% of the grid line intersections within the sample area shall be examined, and grid line spacing shall be selected such that a minimum of 100 measurements are obtained from within the sample area.
  - (b) If the sample area exceeds 100 contiguous square feet, the Owner may develop a sampling plan for examination of grid line intersections within the sample area. Locations of ultrasonic thickness measurements to be taken at grid line intersections shall be selected at random throughout the sample area. The minimum number of measurements shall be 100, or shall be sufficient to ensure at least a 95% confidence level that the thickness of the base metal is reduced by no more than 10% of the nominal plate thickness at 95% of the grid line intersections within the sample area, whichever is greater.
  - (c) If any ultrasonic thickness measurements within the sample area reveal that the thickness of the base metal is reduced by more than 10% of the nominal plate thickness, all remaining grid line intersections within the sample area shall be examined, and additional UT examinations from outside of the sample area shall be required. These additional UT examinations shall be performed on another area from within the larger augmented examination area that is at least as large as the initial sample area. If any of these subsequent examinations reveal that the thickness of the base metal is reduced by more than 10% of the nominal plate thickness, additional areas from within the larger augmented examination area shall be examined until subsequent examinations of additional areas reveal no measurements where metal loss exceeds 10% of the nominal plate thickness, or until the entire augmented examination area has been examined.
- (5) When an ultrasonic thickness measurement performed at a grid line intersection reveals that the thickness of the base metal is reduced by more than 10% of the nominal plate thickness, the minimum wall thickness shall be determined and located within each adjoining grid.
- (6) Measurements need not be obtained at locations where obstructions interfere with grid line intersections.