



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

MAY 06 1999

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

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

Gentlemen:

In the Matter of
Tennessee Valley Authority

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)

Docket No. 50-390

**WATTS BAR NUCLEAR PLANT (WBN) - UNIT 1 - AMERICAN SOCIETY OF
MECHANICAL ENGINEERS (ASME) SECTION XI, INSERVICE INSPECTION -
REQUEST FOR RELIEF 1-RR-3**

In accordance with 10 CFR 50.55a(a)(3)(i), TVA is requesting relief from specified inservice inspection requirements in Section XI of the ASME Boiler and Pressure Vessel Code for WBN Unit 1. The Enclosure to this letter provides request for relief 1-RR-3, for NRC review and approval.

During an NRC inspection at TVA's Browns Ferry Nuclear Plant (BFN) on April 26, 1999, TVA was notified by an NRC inspector that the staff had determined that the current code of record for BFN Units 2 and 3 does not allow the use of wire type penetrameters as Image Quality Indicators (IQIs) for performing radiographic inspections. While TVA considers the current code of record to allow the use of wire type penetrameters, this relief is being requested to expeditiously resolve the issue. The radiographic procedure utilized at BFN which references use of wire type penetrameters is the same as used at WBN.

TVA is requesting NRC approval to use wire type penetrameters in lieu of plaque type penetrameters for performing radiographic inspections.

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

The applicable ASME Section XI Code for the WBN Unit 1 first ten year inspection (ISI) interval is the 1989 Edition with no addenda. By letter dated May 6, 1996, TVA submitted a request for relief for WBN Unit 1 that proposed to use ASME Code Case N-416-1, "Alternate Pressure Test Requirement for Welded Repairs or Installation of Replacement Items by Welding, Class 1, 2, and 3, Section XI, Division 1." ASME Code Case N-416-1 invokes the 1992 Edition, no Addenda, of the ASME Code, Section III in the performance of nondestructive examination of piping weldments. The NRC Staff approved the request for relief by letter dated September 23, 1997. ASME Section III, Articles NB-5111 and NC-5111, require that "...Radiographic examination shall be in accordance with Section V, Article 2, except that ...the penetrameters of Table NB-5111-1 (NC-5111-1) shall be used in lieu of those shown in Table T-276" (of ASME Section V). Tables NB-5111-1 and NC-5111-1 specify only plaque type penetrameters. The tables do not specifically address the equivalency or use of wire IQIs. However, equivalent wire type IQIs were incorporated into these tables in the 1993 Addenda of the 1992 Edition of the ASME Section III Code.

There is existing precedent for this request for relief. TVA's request for relief is consistent with a request submitted for San Onofre Nuclear Generating Station, Units 2 and 3, by letter dated August 26, 1998. NRC approved the request for relief by letter dated April 19, 1999. TVA's Browns Ferry Nuclear Plant has also submitted a similar request for relief on April 27, 1999. Approval of that relief request was granted April 29, 1999.

There are no commitments contained in this letter. If you have any questions, please telephone me at (423) 365-1824.

Sincerely,



P. L. Pace
Manager, Licensing and
Industry Affairs

Enclosure

cc: See page 3

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cc (Enclosure):

NRC Resident Inspector
Watts Bar Nuclear Plant
1260 Nuclear Plant Road
Spring City, Tennessee 37381

Mr. Robert E. Martin, Senior Project Manager
U.S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Rockville, Maryland 20852

U.S. Nuclear Regulatory Commission
Region II
Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, Georgia 30303

ENCLOSURE

WATTS BAR NUCLEAR PLANT UNIT 1
REPAIR AND REPLACEMENT REQUEST FOR RELIEF
REQUEST FOR RELIEF 1-RR-3

ENCLOSURE

WATTS BAR NUCLEAR PLANT UNIT 1
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Summary: In accordance with 10 CFR 50.55a(a)(3)(i), TVA is requesting relief from specified inservice inspection requirements in Section XI of the ASME Boiler and Pressure Vessel Code. TVA is seeking approval to use wire type Image Quality Indicators in lieu of plaque type penetrameters for performing radiographic inservice inspections. Penetrameters are Image Quality Indicators (IQI) used to ensure that the desired sensitivity, definition, and contrast has been achieved in radiographic examination of materials.

The applicable edition of ASME Section XI of the Code for WBN Unit 1 for its First Ten Year inspection (ISI) is the 1989 Edition with no addenda. By letter dated May 6, 1996, TVA submitted a request for relief that proposed to use ASME Code Case N-416-1, "Alternate Pressure Test Requirement for Welded Repairs or Installation of Replacement Items by Welding, Class 1, 2, and 3, Section XI, Division 1," which invokes the 1992 Edition, no Addenda of the ASME Code, Section III in the performance of nondestructive examination of piping weldments. NRC approved the request for relief by letter dated September 23, 1997. ASME Section III, Articles NB-5111 and NC-5111, require that "...Radiographic examination shall be in accordance with Section V, Article 2, except that ...the penetrameters of Table NB-5111-1 (NC-5111-1) shall be used in lieu of those shown in Table T-276" (of ASME Section V). Tables NB-5111-1 and NC-5111-1 specify only plaque type penetrameters and do not address the equivalency use of wire IQIs. However, equivalent wire type IQIs were incorporated into these tables in the 1993 Addenda of the 1992 Edition of the ASME Section III Code. TVA's request for relief is consistent with a request submitted for San Onofre Nuclear Generating Station, Units 2 and 3, by letter dated August 26, 1998, and approved by letter dated April 19, 1999, and TVA's Browns Ferry Nuclear Plant submitted April 27, 1999, and approved by letter dated April 29, 1999.

Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), TVA requests that relief be granted for the WBN Unit 1 First Ten Year Inservice Inspection Interval.

Unit: 1
System: All ASME Code Class 1, 2, and 3 Systems
Components: Various
Code Class: ASME Code Class 1, 2, and 3 (Equivalent)

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Code

Requirement: ASME Code Section III, 1992 Edition, No Addenda, Articles NB-5111 and NC-5111, require that "...Radiographic examination shall be in accordance with Section V, Article 2, except that... the penetrameters of Table NB-5111-1 (NC-5111-1) shall be used in lieu of those shown in Table T-276" (of ASME Section V)

Code

Requirement
From Which
Relief Is

Requested: Relief is requested from using ASME Code Section III, 1992 Edition, No Addenda, Articles NB-5111 and NC-5111, which require that "...Radiographic examination shall be in accordance with Section V, Article 2, except that... the penetrameters of Table NB-5111-1 (NC-5111-1) shall be used in lieu of those shown in Table T-276" (of ASME Section V)

Basis

for Relief: The plaque type penetrameters are difficult to use due to the physical placement and radiograph characteristics. The placement of flat plaques on curved surfaces of pipe components usually require shimming. After positioning the plaque on test material and performing a radiographic examination, the recorded radiographic characteristics of the essential T-hole is often obscured or distorted due to specimen anomalies, part geometry, or film artifacts outside the area of interest. These difficulties create re-shoot conditions. The re-shoots have a negative ALARA impact due to the additional radiation exposure to the radiography crew.

Alternative

Examination: TVA proposes to use wire type Image Quality Indicators (IQIs) for radiography examinations as provided for in ASME Section III, 1992 Edition, 1993 Addenda

Justification

For The
Granting Of
Relief:

The plaque type penetrameters are difficult to use due to physical placement and radiograph characteristics. The placement of flat plaques on curved surfaces of pipe components usually require shimming. After positioning the plaque on test material and performing a radiographic examination, the recorded radiographic characteristics of the essential T-hole is often

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obscured or distorted due to specimen anomalies, part geometry, or film artifacts outside the area of interest. These difficulties create re-shoot conditions. The re-shoots have a negative ALARA impact due to the additional radiation exposure to the radiography crew.

The use of wire type IQIs are superior to plaque type IQIs for nuclear piping components applications. Wire IQIs can be placed directly across the area of interest, thus encompassing the object's range of density and geometry. The one-inch minimum length of the essential IQI wire eliminates the problem of indicator loss due to distortion, anomalies, and part geometry. The wire type IQIs provide the same function as the plaque type penetrameters by indicating a change in thickness and spatial resolution of the image without the use of shim blocks and pipe standards.

Wire IQIs have been shown to provide quality and sensitivity equivalent to plaque type penetrameters as documented in Table 4 of ASTM E747-87. Equivalent sensitivity has also been demonstrated in ASME Section V, Article 22, Standard SE-747. Because of the equivalent sensitivity, the proposed alternative (i.e., wire IQIs) provides equivalent results to the current testing method of plaque type penetrameters. Therefore, the quality of the inspection and resulting safety of the plant, based on the inspection results are not impacted by this proposed alternative.

The intent of this request for relief is to apply the sensitivity level specified in Tables NB-5111-1 and NC-5111-1 to the selection of the appropriate wire type IQI from Table 4 of Standard SE-747. The information provided above supports the proposed use of wire type IQIs and provides an acceptable level of quality and safety, and the use of plaque type penetrameters may result in unusual difficulty without a compensating increase in the level of quality and safety. Pursuant to 10 CFR 50.55a(a)(3)(i), TVA requests that relief be granted.

Implementation

Schedule: This request for relief is applicable to the First Ten-Year Inservice Inspection Interval for WBN Unit 1.