



Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402-2801

February 23, 2001

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

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555-0001

Gentlemen:

In the Matter of)	Docket Nos.	50-260	50-296
Tennessee Valley Authority)		50-327	50-328
		50-390	

BROWNS FERRY NUCLEAR PLANT (BFN), UNITS 2 AND 3, SEQUOYAH
NUCLEAR PLANT (SQN), UNITS 1 AND 2, AND WATTS BAR NUCLEAR PLANT
(WBN), UNIT 1 - AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
SECTION XI, INSERVICE INSPECTION (ISI) PROGRAM REQUEST FOR RELIEF -
NO. PDI-1 AND PDI-2

In accordance with 10 CFR 50.55a (a) (3) (i), TVA is requesting two generic ISI Program relief requests applicable to BFN Units 2 and 3, SQN Units 1 and 2, and WBN Unit 1. These two generic requests outline proposed alternatives to meeting the requirements of Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems," of the 1995 Edition through the 1996 Addenda of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, as required in the September 22, 1999 revision to Code of Federal Regulations, Title 10, Part 50, Section 55a, (10 CFR 50.55a).

The two proposed generic requests (PDI-1 and PDI-2) ask for relief from meeting the requirements as shown in Appendix VIII and other associated requirements of the applicable ISI Program Codes-of-Record. These requests allow for the optimization of

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TVA's ISI/NDE programs by using alternatives that are shown in the Electric Power Research Institute (EPRI) Performance Demonstration Initiative (PDI) Guidelines and other industry initiatives. The proposed alternatives will bring the TVA Ultrasonic (UT) Examination procedures and the UT systems and examination personnel qualifications in line with the EPRI PDI Program Description, Revision 1, Change 1, dated December 30, 1996 and in line with the EPRI "Guideline For Implementation of Appendix VIII and 10 CFR 50.55a," Volume One, Revision 1, dated July 11, 2000. These EPRI PDI guidelines have been endorsed in the September 22, 1999 revision to 10 CFR 50.55a.

A similar request for relief to TVA's PDI-2 has been submitted by the Florida Power and Light Company, St. Lucie Nuclear Power Plant, and subsequently granted. St. Lucie's Unit 2 Request for Relief No. 25 was approved by the NRC Staff in a letter dated October 4, 1999.

TVA requests review of these requests for relief by June 30, 2001 to support future refueling outages. There are no commitments contained in this letter.

Please contact Susan Ferrell (423) 751-7737, if you have questions.

Sincerely,


Mark J. Burzynski
Manager
Nuclear Licensing

Enclosures

cc : See page 3

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cc (Enclosures):

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ENCLOSURE 1

TENNESSEE VALLEY AUTHORITY (TVA)

**BROWNS FERRY NUCLEAR PLANT (BFN), UNIT 2
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
SECTION XI INSERVICE INSPECTION (ISI) PROGRAM
3rd 10-YEAR INSPECTION INTERVAL**

**BROWNS FERRY NUCLEAR PLANT (BFN), UNIT 3
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
SECTION XI INSERVICE INSPECTION (ISI) PROGRAM
2ND 10-YEAR INSPECTION INTERVAL**

**SEQUOYAH NUCLEAR PLANT (SQN), UNITS 1 AND 2
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
SECTION XI INSERVICE INSPECTION (ISI) PROGRAM
2ND 10-YEAR INSPECTION INTERVAL**

**WATTS BAR NUCLEAR PLANT (WBN), UNIT 1
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
SECTION XI INSERVICE INSPECTION PROGRAM
1ST 10-YEAR INSPECTION INTERVAL**

REQUEST FOR RELIEF - NO. PDI-1

EXECUTIVE SUMMARY

American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI in the 1995 Edition, 1996 Addenda (95A96), Appendix VIII paragraph VIII-2200 requires personnel to be qualified to perform the ultrasonic examinations (UT) in accordance with Appendix VII. Appendix VII, Sub-subarticle VII-4240 requires UT-qualified examiners to complete a minimum of ten hours documented supplemental technical training each year. Title 10, Part 50, Section 55a, as revised in September 22, 1999 (*Federal Register*, Volume 64, No. 183) imposes different training requirements. Paragraph 10 CFR 50.55a(b)(2)(xiv) requires a minimum of eight hours of annual hands-on training with specimens that contain known cracks. This training must be completed no earlier than six months prior to performing UT examinations at the licensee's facilities. Currently, in order to comply with the Appendix VII requirements and the training imposed under Paragraph 10 CFR 50.55a(b)(2)(xiv), TVA is conducting training consisting of ten hours of supplemental technical training and up to two sessions of 8-hour hands-on training with cracked specimens. This relief request is being submitted to request continued performance of only the 8-hour hands-on training sessions. This annual training alone will provide a continued equivalent level of quality and safety. It

will also bring training in line with the training recommendations provided in the Electric Power Research Institute (EPRI) Performance Demonstration Initiative (PDI) Guidelines and industry standards. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), TVA requests that relief be granted from meeting the requirements of ASME Section XI, Appendix VII, Sub-subarticle VII-4240.

SYSTEM/COMPONENT(S) FOR WHICH RELIEF IS REQUESTED

Not applicable.

ASME SECTION XI CODE EDITION/ADDENDA

The applicable ASME Section XI Code Editions and Addenda include the 1995 Edition with 1996 Addenda as delineated in 10 CFR 50.55a(b)(2). In addition, the applicable plant and unit specific ISI Program ASME Section XI Code Editions and Addenda of Record (with incorporated ASME Code Cases, as approved) include:

- BFN Unit 2: 1986 Edition (for the selection of components only)
Note: The 1986 Edition does not include Appendix VIII or Appendix VII requirements.
- BFN Unit 3: 1989 Edition (includes Appendix VII only)
- SQN Unit 1: 1989 Edition (includes Appendix VII only)
- SQN Unit 2: 1989 Edition (includes Appendix VII only)
- WBN Unit 1: 1989 Edition (includes Appendix VII only)

CODE REQUIREMENTS

The ASME Section XI 1995 Edition with the 1996 Addenda (95A96) requires the use of mandatory Appendix VIII; "Performance Demonstration of Ultrasonic Examination Systems." Appendix VIII, Sub-subarticle VIII-2200, "Personnel Requirements," states: "Personnel shall meet the requirements of Appendix VII and shall be qualified in accordance with VIII-3000." In turn, Appendix VII, Sub-subarticle VII-4240 (of the 95A96 Code and of the 1989 Code), "Annual Training," states: "Supplemental training is required on an annual basis to impart knowledge of new developments, material failure modes, and any pertinent technical topics as determined by the Employer. The extent of this training shall be a minimum of 10 hr. per year."

As part of the accelerated implementation of the 95A96 Appendix VIII requirements under revised 10CFR50.55a, paragraph 10 CFR 50.55a(b)(2)(xiv) requires that all personnel qualified for performing UT examinations must receive eight hours of annual hands-on training on specimens that contain cracks. This training must be completed no earlier than six months prior to performing UT examinations at a licensee's facility.

REQUIREMENT FROM WHICH RELIEF IS REQUESTED

Relief is requested, in accordance with 10 CFR 50.55a(a)(3)(i), from meeting the provisions of ASME Section XI 1995 Edition with the 1996 Addenda (95A96), Appendix VII, Sub-subarticle VII-4240, "Annual Training." These provisions will be implemented during the current ISI intervals for the applicable plant/unit (2nd interval for BFN Unit 3 and for SQN Units 1 and 2; and the 1st interval for WBN Unit 1). In the case of BFN Unit 2, the 2nd inservice inspection program interval will end on May 24, 2001 and its 3rd interval will commence May 25, 2001. For the BFN Unit 2 ISI Program, it is requested that this request be approved for use for the 3rd inspection interval. However, if concurrence is received in time to support the 2nd interval of inservice inspection program inspections scheduled during the BFN Unit 2 Spring 2001 refueling outage, TVA would like to apply this relief request to the remaining scope of the second interval.

BASIS FOR RELIEF

In the Articles of Consideration supporting the revised 10CFR50.55a (*Federal Register* Volume 64, No. 183), Paragraph 2.4.1.1.1, provided the following basis discussion on the adequacy of the training requirements of ASME Section XI 1995 Edition with the 1996 Addenda (95A96), Appendix VII, Sub-subarticle VII-4240:

"The NRC had determined that this requirement [*i.e. 10 hours of training on an annual basis*] was inadequate for two reasons. The first reason was that the training does not require laboratory work and examination of flawed specimens. Signals can be difficult to interpret and, as detailed in the regulatory analysis for this rulemaking, experience and studies indicate that the examiner must practice on a frequent basis to maintain the capability for proper interpretation. The second reason is related to the length of training and its frequency. Studies have shown that an examiner's capability begins to diminish after 6 months if skills are not maintained. Thus, the NRC had determined that 10 hours of annual training is not sufficient practice to maintain skills, and that an examiner must practice on a more frequent basis to maintain the proper skill level,"

It further states that:

"The PDI [Performance Demonstration Initiative] program has adopted a requirement for 8 hours of training, but it is required to be hands-on practice. In addition, the training must be taken no earlier than 6 months prior to performing examinations at a licensee's facility. PDI believes that 8 hours will be acceptable relative to an examiner's abilities in this highly specialized skill area because personnel can gain knowledge of new developments, material failure modes, and other

pertinent technical topics through other means. Thus, the NRC has decided to adopt in the final rule the PDI position on this matter. These changes are reflected in [section] 50.55a(b)(2)(xiv) of the final rule change.”

ALTERNATIVE EXAMINATIONS

Annual hands-on ultrasonic training will be conducted in accordance with the requirements of 10 CFR 50.55a(b)(2)(xiv) in lieu of the requirements of Section XI, Appendix VII, paragraph VII-4240.

JUSTIFICATION FOR GRANTING RELIEF

Implementation of the requirements contained in Appendix VII, in addition to the mandated requirements in the revised 10 CFR 50.55a(b)(2)(xiv), will result in redundant training systems. This will result in inefficient use of examination personnel time. Performance of the annual training in accordance with the requirements of 10 CFR 50.55a(b)(2)(xiv) will ensure that UT examiner’s performance skills are maintained and also provide a degree of exposure for examiners to the industry and technical information. This exposure, along with the maintenance of their other professional duties, will be sufficient to ensure technical proficiency is maintained. The use of the requirements adopted under 10 CFR 50.55a Final Rule, in lieu of the annual training requirements of ASME Section XI, Appendix VII, Sub-subarticle VII-4240, will simplify recordkeeping, satisfy needs for maintaining skills, and provide an acceptable level of quality and safety.

This rigorous, literal compliance with both of the requirements provide for little or no additional benefit in terms of increased safety. The sessions of eight hours of the hands-on training required under 10 CFR 50.55a(b)(2)(xiv) alone will provide a continued equivalent level of quality and safety. It will also bring training into conformance with the recommendation provided in the EPRI PDI Program Description, Revision 1, Change 1, dated December 30, 1996 and in line with EPRI’s “Guideline For Implementation of Appendix VIII and 10 CFR 50.55a,” Volume One, Revision 1, dated July 11, 2000. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), TVA requests that relief be granted from meeting the requirements of ASME Section XI, Appendix VII, Sub-subarticle VII-4240.

IMPLEMENTATION SCHEDULE

Upon approval by the NRC Staff, the provisions of this request will be implemented during the current ISI intervals for the applicable plant/unit (i.e., the 2nd ISI program intervals for

BFN Unit 3 and SQN Units 1 and 2; and the 1st interval for WBN Unit 1). For the BFN Unit 2 ISI Program, this request will be used for the 3rd inspection interval (May 25, 2001 through May 24, 2011). However, if concurrence is received in time to support the 2nd interval of inservice inspection program inspections scheduled during the BFN Unit 2 Spring 2001 refueling outage, TVA would like to apply this relief request to the remaining scope of the second interval.

ENCLOSURE 2

TENNESSEE VALLEY AUTHORITY

**BROWNS FERRY NUCLEAR PLANT (BFN), UNIT 2
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
SECTION XI INSERVICE INSPECTION (ISI) PROGRAM
3rd 10-YEAR INSPECTION INTERVAL**

**BROWNS FERRY NUCLEAR PLANT (BFN), UNIT 3
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
SECTION XI INSERVICE INSPECTION (ISI) PROGRAM
2ND 10-YEAR INSPECTION INTERVAL**

**SEQUOYAH NUCLEAR PLANT (SQN), UNITS 1 AND 2
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
SECTION XI INSERVICE INSPECTION (ISI) PROGRAM
2ND 10-YEAR INSPECTION INTERVAL**

**WATTS BAR NUCLEAR PLANT (WBN), UNIT 1
AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)
SECTION XI INSERVICE INSPECTION (ISI) PROGRAM
1ST 10-YEAR INSPECTION INTERVAL**

REQUEST FOR RELIEF - NO. PDI-2

EXECUTIVE SUMMARY

TVA's current programs' Code requirements for the examination volumes of the Class 1 reactor vessel pressure-retaining nozzle-to-vessel welds are shown in Figures IWB-2500-7(a), IWB-2550-7(b), and IWB-2500-7(c) of the applicable ASME Section XI Codes. These figures require that licensees perform examinations of the weld volumes and the adjacent vessel or nozzle base metal material regions to the extent of a length equivalent to one-half ($\frac{1}{2}$) the vessel shell thickness (t_s) [i.e. $t_s/2$] beyond the end of the weld's boundary. The extent of the examination volume for a given nozzle-to-vessel weld dictates the exam time and the amount of radiation dose exposure of the personnel involved. Historical improvements in the ultrasonic examination techniques and the qualifications of the examiners in accordance with Section XI, Appendix VIII, have reduced the necessity of having the nozzle-to-vessel weld exam volumes as large as currently required in Figures IWB-2500-7 (a), (b), and (c). As a resolution of this issue, the ASME Code committee approved and published ASME Code Case N-613, "Ultrasonic Examination of Full Penetration Nozzles in Vessels, Examination Category B-D, Items Nos. B3.10 and B3.90, Reactor Vessel-To-Nozzle Welds, Fig. IWB-

2500-7(a), (b), and (c) Section XI, Division 1.” This ASME Code Case N-613 reduces the required examination volume’s extent (next to the widest part of the weld) from one-half ($\frac{1}{2}$) of the shell thickness to one-half ($\frac{1}{2}$) inch beyond the boundary of the weld. The use of the part of Code Case N-613 to reduce the exam volume, in lieu of the current ASME Section XI Code required examination volumes, will result in a reduction of examination time and the associated examination personnel radiation exposure while maintaining an acceptable level of quality and safety. Accordingly, pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested to use the alternative examination volume requirements of Code Case N-613, Figures 1, 2, and 3, in lieu of the requirements shown in ASME Section XI Figures, IWB-2500-7 (a), (b), and (c).

SYSTEM/COMPONENT(S) FOR WHICH RELIEF IS REQUESTED

ASME Class 1 Reactor Pressure Vessel Pressure-retaining Nozzle-To-Vessel welds.

ASME SECTION XI CODE EDITION/ADDENDA

In addition to the 1995 Edition with the 1996 Addenda ASME Section XI Code Appendix VIII requirements dictated by 10 CFR 50.55a, Final Rule, the applicable plant and unit-specific ISI Program ASME Section XI Code Editions and Addenda of Record (with incorporated ASME Code Cases, as approved) include:

BFN Unit 2:	1986 Edition
BFN Unit 3:	1989 Edition
SQN Unit 1:	1989 Edition
SQN Unit 2:	1989 Edition
WBN Unit 1:	1989 Edition

Note: In the case of BFN Unit 2, the unit’s 2nd inservice inspection program interval will end on May 24, 2001 and its 3rd interval will commence May 25, 2001. In compliance with 10 CFR 50.55a(g)(4)(ii), BFN Unit 2 draft 3rd interval ISI program has incorporated the requirements of the 1995 Edition with the 1996 Addenda (95A96). The required examination volumes of the nozzle-to-vessel welds described in Figures IWB-2500-7(a), (b), and (c) of the 95A96 Code are the same as those shown in the 1986 and 1989 Section XI Codes. Therefore, the proposed relief request is equally applicable to the proposed BFN Unit 2 3rd interval ISI Program. For the BFN Unit 2 ISI Program, it is requested that this request be approved for use for the 3rd inspection interval. However, if concurrence is received in time to support the 2nd interval of inservice inspection program inspections scheduled during the BFN Unit 2 Spring 2001 refueling outage, TVA would like to apply this relief request to the remaining scope of this interval.

CODE REQUIREMENTS

In accordance with the applicable plant's and unit's ISI Program ASME Section XI, Code-of-Record, rules for Inservice Inspection of Nuclear Power Plant Components, the requirements for nozzle-to-vessel weld examination volume shown in Section XI, Subsection IWB, Examination Category B-D Full Penetration Welds of Nozzles in Vessels - Inspection Program B, Code Item Number B3.90, with Figures IWB-2500-7(a), IWB-2500-7(b), and IWB-2500-7(c) are applicable.

By reference in the applicable ASME Section XI Code paragraphs on Ultrasonic Examinations (UT), i.e., paragraph IWA-2232, Article 4 of ASME Section V [from the corresponding Code Edition and Addenda] is invoked as the requirements to which UT examinations must be conducted on vessel welds greater than two inches in thickness. Paragraphs T-441.3.2.5, "Angle Beam Scanning," T-441.3.2.6, "Scanning for Reflectors Oriented Parallel to the Weld," and T-441.3.2.7, "Scanning for Reflectors Oriented Transverse to the Weld," of Article 4 are also applicable.

REQUIREMENT FROM WHICH RELIEF IS REQUESTED

The specific Code requirement from which relief is requested is the requirement to perform the volumetric examination of the indicated nozzle-to-vessel welds in accordance with the examination volume requirements shown in ASME Section XI, Subsection IWB, Figures IWB-2500-7(a), (b), and (c). Pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested to use the alternative requirements of ASME Section XI Code Case N-613, Figures 1, 2, and 3, in lieu of the requirements of ASME Section XI, Figures IWB-2500-7(a), IWB-2500-7(b) and IWB-2500-7(c). When performing the examinations of nozzle-to-vessel welds, TVA will comply with the special requirements imposed in 10 CFR 50.55a(b)(2)(xv)(K)(1) and special requirements imposed by 10 CFR 50.55a(b)(2)(xv)(K)(2). These requirements dictate that the examination scanning processes must also be performed in such a manner to detect flaws oriented axially with the nozzle. TVA will continue to perform the required UT examinations in accordance with the requirements of revised 10 CFR 50.55a(b)(2)(xv)(K)(1) and 10 CFR 50.55a(b)(2)(xv)(K)(2), except that the exam volume will be in accordance with Figures 1, 2, and 3 of ASME Code Case N-613.

BASIS FOR RELIEF

Inservice examination of selected Reactor Pressure Vessel (RPV) nozzle-to-vessel welds at TVA nuclear plants is currently performed in accordance with the requirements of 10 CFR 50.55a, plant Technical Specifications and/or Technical Requirements, as applicable, and the associated ASME Section XI, ISI Program Codes-of-Record Editions and Addenda of the ASME Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components." The current applicable ISI Program based Code Editions (1986 Edition for BFN Unit 2 and the 1989 Edition for BFN Unit 3, SQN Units 1 and 2, and

WBN Unit 1) invoke the examination volume requirements of Figures IWB-2500-7(a), WB-2500-7(b) and IWB-2500-7(c). These Codes also invoke the examination requirements of ASME Section XI, Appendix I, Article I-2000 which in turn reference ASME Section V, Article 4, of the associated Editions and Addenda of Section V. The prescribed nondestructive examination requirements of the 1989 Edition of Section V are essentially twenty year old examination methodology. Under the new required Appendix VIII procedures, the required examinations will be performed using procedures developed and qualified in accordance with the revised 10CFR50.55a mandated requirements of ASME Code, Section XI, Division 1, 1995 Edition with the 1996 Addenda of Appendix VIII and Supplement 7. These procedures provide for a more rigorous methodology for Ultrasonic Examinations.

ALTERNATIVE EXAMINATIONS

TVA will perform the examinations of the RPV nozzle-to-vessel welds as follows:

1. Ultrasonic examinations of the RPV nozzle-to-vessel welds in accordance with the requirements of ASME Section XI, Appendix VIII, with examination volumes as defined in ASME Section XI, Code Case N-613 Figures 1, 2, and 3.
2. In accordance with the requirements shown in ASME Section XI, Appendix VIII of the 1995 Edition with the 1996 Addenda, as amended by the Final Rule and as required in paragraphs 10 CFR 50.55a(b)(2)(xiv), (xv), and (xvi); and in 10 CFR 50.55a(g)(6)(ii)(C) through the use of the EPRI PDI program document, "PDI Program Description," Revision 1, Change 1, as allowed in the discussion on the Final Rule published in the *Federal Register*.
3. Continued periodic system pressure tests of the RPV in accordance with ASME Section XI requirements of Table IWB-2500-1 for Category B-P items.

JUSTIFICATION FOR GRANTING RELIEF

The current examination volume required by IWB-2500-7(a), (b), and (c) for the reactor vessel pressure retaining nozzle-to-vessel welds extends far beyond the weld and the heat effected zones into the base metal and is unnecessarily large. This extends examination time significantly, increases the radiation exposure of exam support personnel, and results in no net increase in safety; as the additional area being examined is a base-metal region of the reactor vessel shell or nozzle wall areas in which industry experience has shown service-induced cracks are not prone to occurring. In addition, these regions have been extensively examined during the fabrication and installation periods before the vessels were put in service and during the inservice examinations already performed.

ASME Code Case N-613 reduces the boundary limit of the required UT examination volumes adjacent to the widest part of the weld from one-half ($\frac{1}{2}$) of the vessel wall thickness to one-half ($\frac{1}{2}$) inch. This eliminates base metal material volume to be examined that was extensively examined during construction and preservice examinations, where applicable; and, eliminates areas which are not located in the high-stressed areas of the weld geometry. The high-stressed areas of the various nozzle-to-vessel weld configurations are adequately addressed and contained in the examination volume defined by Code Case N-613 Figures 1, 2, and 3.

ASME Code Case N-613 also de-emphasizes the requirement to scan in a manner to detect flaws perpendicular to the weld-to-base metal interface on the basis that such flaws do not occur as a result of the welding processes. The likelihood of inservice-induced cracking with this orientation and in these base-metal regions (beyond the $\frac{1}{2}$ inch exam boundary) is very low, having never been observed in industry experience. In addition, these areas have been extensively examined and heat-treated during the RPV fabrication processes after the installation of the nozzle forgings. This aspect of Code Case N-613 is under review by the ASME Section XI Code Committee. Therefore, TVA will not request to use these specific provisions of Code Case N-613 and only seeks to use the provisions for the reduced examination volumes shown in Figures 1, 2, and 3.

The application of the ASME Code Case N-613 requirements will be conducted in conjunction with TVA's programmatic implementation of ASME Section XI, Appendix VIII. TVA will implement these requirements in accordance with the requirements shown in ASME Section XI, Appendix VIII of the 1995 Edition with the 1996 Addenda, as required in paragraphs 10 CFR 50.55a(b)(2)(xiv), (xv), and (xvi); and in 10 CFR 50.55a(g)(6)(ii)(C). TVA will comply with these requirements through the use of the Electric Power Research Institute (EPRI) Performance Demonstration Initiative (PDI) program document, "PDI Program Description," Revision 1, Change 1, as allowed in the discussion on the Final Rule published in the *Federal Register*, Volume 64, No. 183, page 51390, (see Section 2.7), dated September 22, 1999. These procedures will ensure that the performance-based UT methodologies and techniques used will be qualified, and examination personnel will be certified by a performance demonstration.

Although not the basis for the request for relief, the use of the specific ASME Code Case N-613 requirements in lieu of the identified ASME Section XI referenced requirements could reduce on-vessel examination time by as much as 12 hours of outage critical path schedule time. This translates to cost savings of \$14,400 for the actual exam costs and some reduction of examination support personnel radiation exposure. An equivalent reduction in the outage duration translates to a replacement power cost savings of approximately \$225,000 to \$350,000, depending upon the circumstances of the outage. The personnel radiation exposure is dependent upon the choice of RPV examination equipment (i.e., automated versus manual) and by the degree of plant RPV contamination and/or decontamination conducted prior to the exam.

It should also be noted that a similar request for relief has been submitted by the Florida Power and Light Company, St. Lucie Nuclear Power Plant, and subsequently granted. St. Lucie's Unit 2 Request for Relief No. 25 was approved by the NRC Staff in a letter dated October 4, 1999.

In conclusion, utilization of the ASME Code Case N-613 requirements in conjunction with the application of Appendix VIII through the use of the PDI program will provide sufficient assurance that RPV nozzle-to-vessel welds have remained free of service-induced flaws or will identify such flaws prior to failure. The application of the PDI techniques will enhance quality of the UT examinations and ensure plant safety and pressure boundary reliability. Therefore, the proposed alternative provides for an acceptable level of quality and safety and, pursuant to 10 CFR 50.55a(a)(3)(i), relief to use the identified parts of ASME Code Case N-613 may be granted.

IMPLEMENTATION SCHEDULE

Upon approval by the NRC Staff, TVA will implement the provisions of this request during the current ISI intervals for the applicable plant/unit (i.e., the 2nd ISI program intervals for BFN Unit 3, and SQN Units 1 and 2; and the 1st interval for WBN Unit 1) and conduct the next scheduled RPV nozzle-to-vessel weld examinations accordingly. For the BFN Unit 2 ISI Program, this request will be used for the 3rd inspection interval (May 25, 2001 through May 24, 2011). However, if concurrence is received in time to support the 2nd interval of inservice inspection program inspections scheduled during the BFN Unit 2 Spring 2001 refueling outage, TVA would like to apply this relief request to the remaining scope of this interval.

**ATTACHMENT 1
(To Enclosure 2)**

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ASME Section XI Code Case

N-613

“Ultrasonic Examination of Full Penetration Nozzles in Vessels, Examination Category B-D, Item No’s. B3.10 and B3.90, Reactor Vessel-To-Nozzle Welds, Figure IWB-2500-7(a), (b), and (c) Section XI, Division 1”

CASES OF ASME BOILER AND PRESSURE VESSEL CODE

Approval Date: July 30, 1998

*See Numeric Index for expiration
and any reaffirmation dates.*

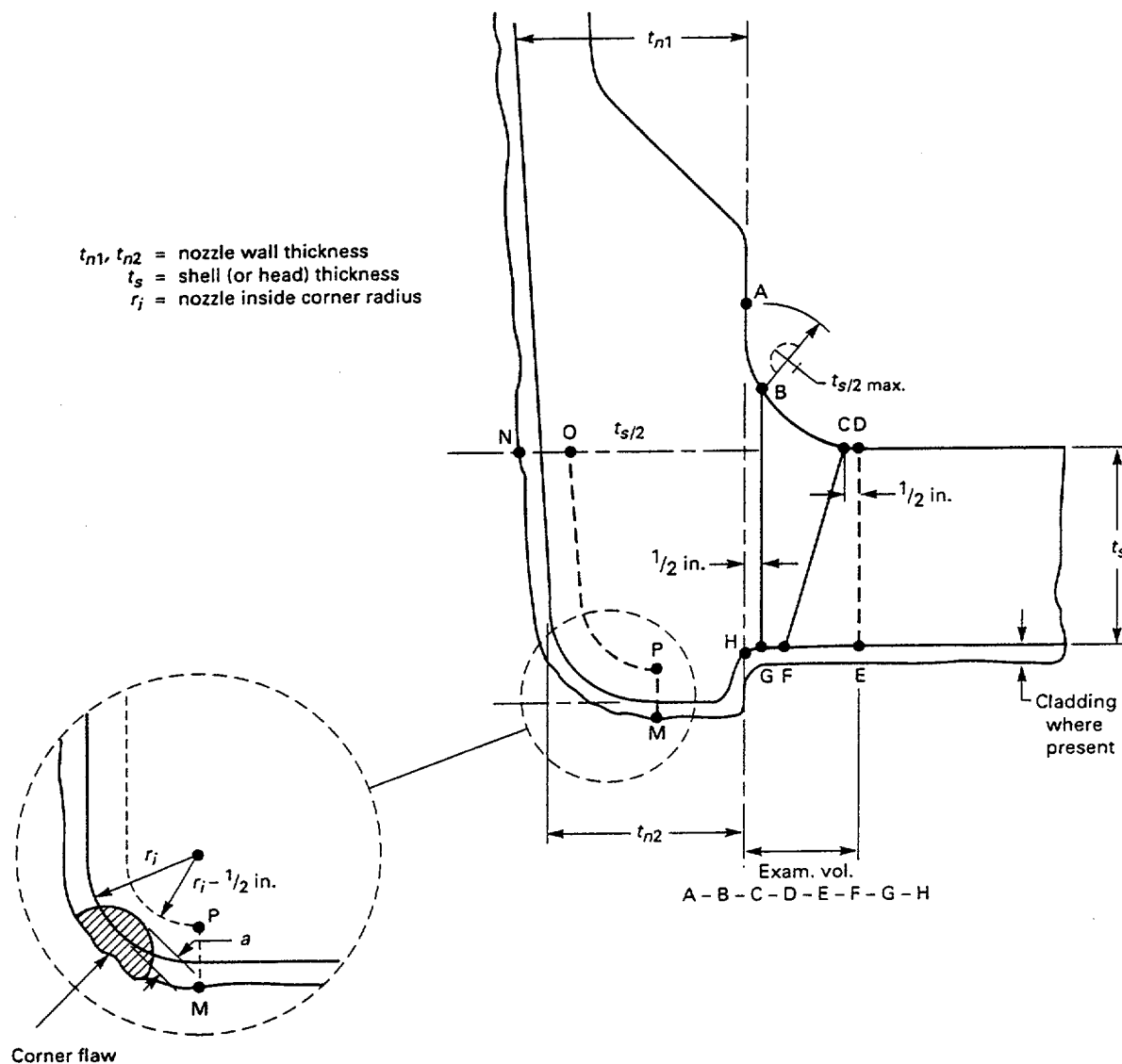
Case N-613

**Ultrasonic Examination of Full Penetration
Nozzles in Vessels, Examination Category B-D,
Item No's. B3.10 and B3.90, Reactor Vessel-To-
Nozzle Welds, Fig. IWB-2500-7(a), (b), and (c)
Section XI, Division 1**

Inquiry: What alternatives to the examination requirements of Section XI, Appendix I and Section V, Article 4 are permissible when performing ultrasonic examination of reactor vessel-to-nozzle welds?

Reply: It is the opinion of the Committee that ultrasonic examination of Category B-D nozzles may be conducted using techniques designed for detection and sizing of surface and subsurface flaws within the examination volume (A-B-C-D-E-F-G-H), oriented in a plane normal to the vessel inside surface and parallel to the weld for Figs. 1 and 2, and oriented in a plane normal to the nozzle inside surface and parallel to the weld for Fig. 3.

CASES OF ASME BOILER AND PRESSURE VESSEL CODE

EXAMINATION REGION [Note (1)]

Shell (or head) adjoining region
 Attachment weld region
 Nozzle cylinder region
 Nozzle inside corner region

EXAMINATION VOLUME [Note (2)]

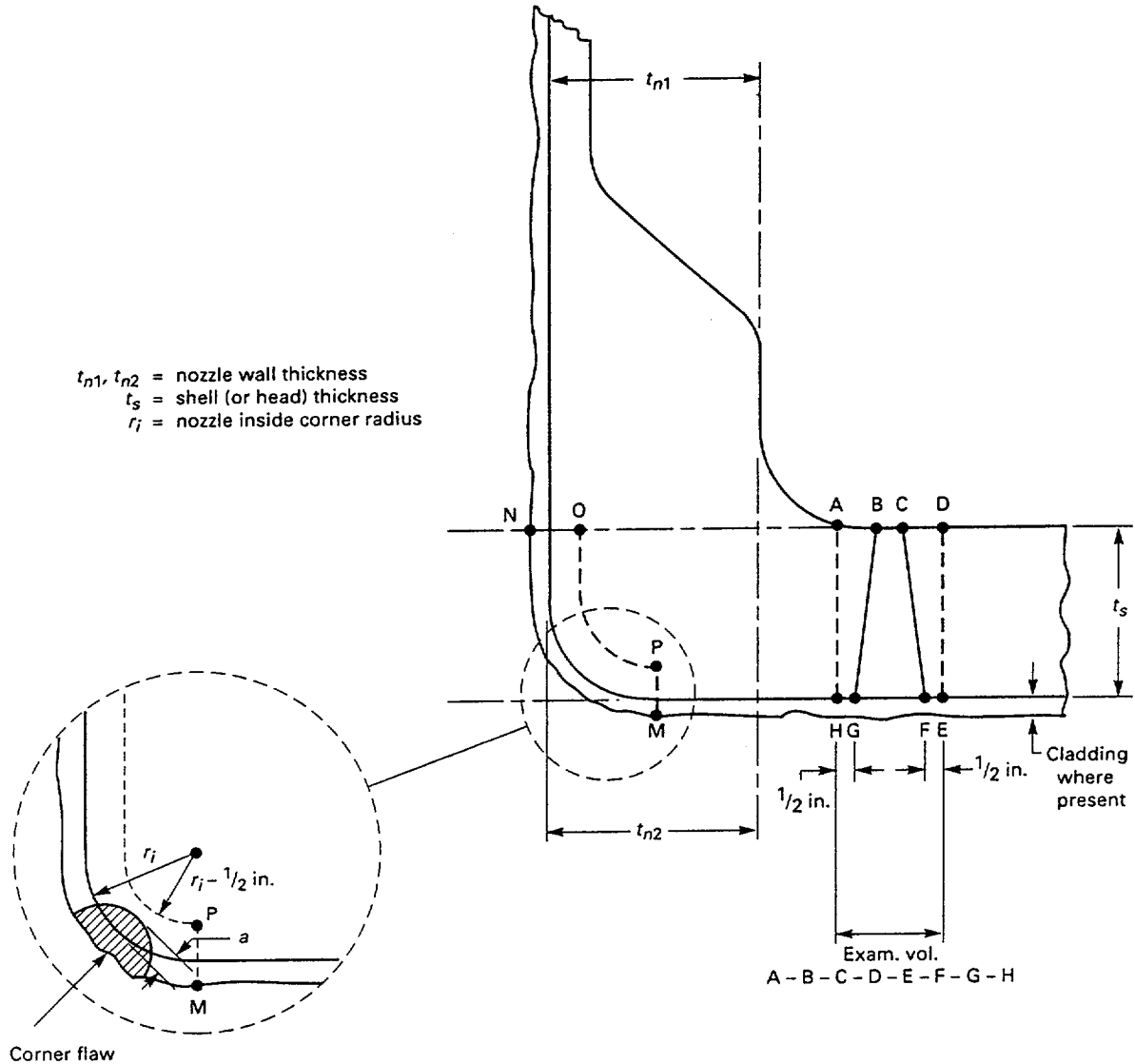
C - D - E - F
 B - C - F - G
 A - B - G - H
 M - N - O - P

NOTES:

- (1) Examination regions are identified for the purpose of differentiating the acceptance standards in IWB-3512.
 (2) Examination volumes may be determined either by direct measurements on the component or by measurements based on design drawings.

FIG. 1 NOZZLE IN SHELL OR HEAD
 (Examination Zones in Barrel Type Nozzles Joined by Full Penetration Corner Welds)

CASES OF ASME BOILER AND PRESSURE VESSEL CODE



EXAMINATION REGION [Note (1)]

Shell (or head) adjoining region
Attachment weld region
Nozzle cylinder region
Nozzle inside corner region

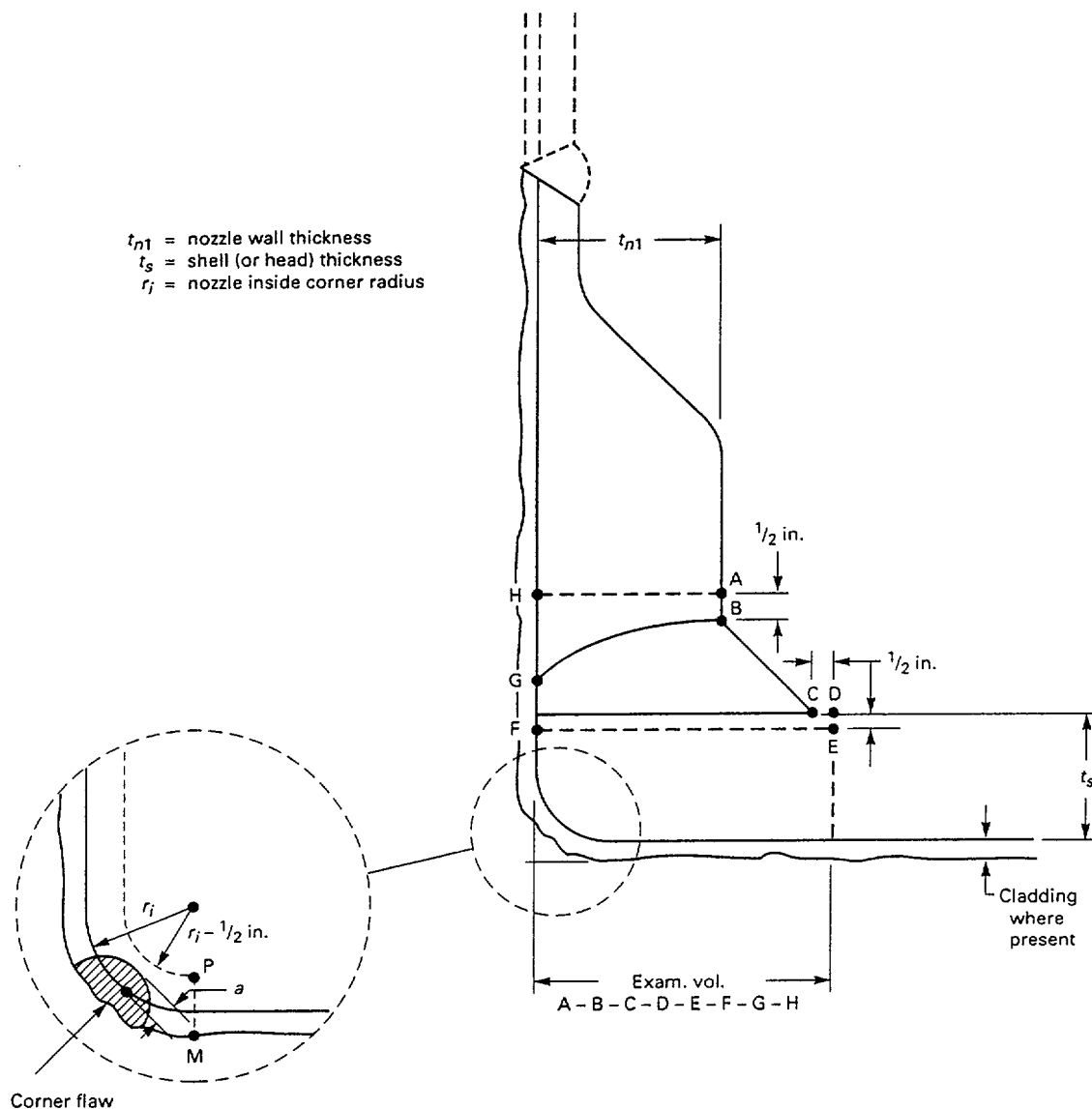
EXAMINATION VOLUME [Note (2)]

C-D-E-F
B-C-F-G
A-B-G-H
M-N-O-P

NOTES:

- NOTES:
- (1) Examination regions are identified for the purpose of differentiating the acceptance standards in IWB-3512.
- (2) Examination volumes may be determined either by direct measurements on the component or by measurements based on design drawings.

FIG. 2 NOZZLE IN SHELL OR HEAD
(Examination Zones in Flange Type Nozzles Joined by Full Penetration Butt Welds)

EXAMINATION REGION [Note (1)]

Shell (or head) adjoining region
 Attachment weld region
 Nozzle cylinder region
 Nozzle inside corner region

EXAMINATION VOLUME [Note (2)]

C-D-E-F-G
 B-C-G
 A-B-G-H
 M-N-O-P

NOTES:

- (1) Examination regions are identified for the purpose of differentiating the acceptance standards in IWB-3512.
 (2) Examination volumes may be determined either by direct measurements on the component or by measurements based on design drawings.

FIG. 3 NOZZLE IN SHELL OR HEAD
 (Examination Zones in Set-On Type Nozzles Joined by Full Penetration Corner Welds)