



**Northeast  
Nuclear Energy**

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The Northeast Utilities System

AUG 25 2000

Docket Nos. 50-336

50-423

B18202

Re: 10 CFR 50.55a(a)(3)(i)  
10 CFR 50.55a(b)(2)  
10 CFR 50.55a(g)(5)(iii)

U.S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, DC 20555

Millstone Nuclear Power Station, Unit Nos. 2 and 3  
Inservice Inspection Program  
Request for Relief From ASME Section XI

Northeast Nuclear Energy Company (NNECO) hereby requests relief from the requirements of 10 CFR 50.55a(b)(2) for the implementation of ASME Section XI, Appendix VIII, 1995 Edition with the 1996 Addenda.

Revisions to 10 CFR 50.55a published September 22, 1999, (Final Rule) mandate the implementation of the ASME Code, Section XI, Division 1, Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems." 10 CFR 50.55a(a)3 allows that alternatives to specific provisions of the Code may be used when approved by the Director, Office of Nuclear Reactor Regulation. Accordingly, NNECO hereby requests relief in accordance with 10 CFR 50.55a(g)(5)(iii) from the requirements described in the Relief Requests contained in Attachments 1, 2, 3 and 4 for Millstone Unit No. 2 third inspection interval, and Millstone Unit No. 3 second inspection interval. The alternatives described herein are determined to provide a commensurate level of quality and safety as allowed under 10 CFR 50.55a(a)(3)(i).

It is requested that NRC approval be provided by December 31, 2000, to support timely implementation of these Relief Requests prior to the next planned refueling outage scheduled for February 2001.

There are no regulatory commitments contained within this letter.

A047

Should you have any questions regarding this matter, please contact Mr. David W. Dodson at (860) 447-1791, extension 2346.

Very truly yours,

NORTHEAST NUCLEAR ENERGY COMPANY

  
Stephen E. Scace - Director  
Nuclear Oversight and Regulatory Affairs

Attachments:

1. Relief Request Nos. RR-89-30 and IR-2-15, Alternate Length Sizing Criteria
2. Relief Request Nos. RR-89-31 and IR-2-16, Austenitic Welds Single Side Access
3. Relief Request Nos. RR-89-32 and IR-2-17, Annual Ultrasonic Retraining
4. Relief Request Nos. RR-89-33 and IR-2-18, Continue Using ASNT SNT-TC-1A for Ultrasonic Personnel

cc: H. J. Miller, Region I Administrator  
J. I. Zimmerman, NRC Project Manager, Millstone Unit No. 2  
S. R. Jones, Senior Resident Inspector, Millstone Unit No. 2  
V. Nerses, NRC Senior Project Manager, Millstone Unit No. 3  
A. C. Cerne, Senior Resident Inspector, Millstone Unit No. 3

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Attachment 1

Millstone Nuclear Power Station, Unit Nos. 2 and 3

Relief Request Nos. RR-89-30 and IR-2-15  
Alternative Length Sizing Criteria

**Relief Request Nos. RR-89-30 and IR-2-15**  
**Alternative Length Sizing Criteria**

Relief Request Nos.: RR-89-30 (Millstone Unit No. 2)  
IR-2-15 (Millstone Unit No. 3)

Code Class: 1

Code Category: B-A, Pressure Retaining Welds in Reactor Vessel

Code Item Nos.: B1.10 Longitudinal and Circumferential Shell Welds and  
B1.20 Head Welds subject to Appendix VIII, Supplement 4,  
Examination.

Code Requirement:

10 CFR 50.55a(b)(2) was amended to reference Section XI of the Code through the 1995 Edition with the 1996 Addenda (64 FR 51370). ASME Section XI, 1995 Edition, 1996 Addenda, Appendix VIII, Supplement 4, Subparagraph 3.2(b), length sizing qualification criteria requires that flaw lengths estimated by ultrasonics be the true length  $-1/4$  inch  $+1$  inch. As amended, 10 CFR 50.55a(b)(2)(xv)(C)(1) requires a depth sizing acceptance criteria of 0.15 inch root mean square (RMS) be used in lieu of the requirements of Subparagraphs 3.2(b) to Supplement 4 to Appendix VIII of Section XI of the 1995 Addenda of the Code.

Code Relief Requested:

Pursuant to 10 CFR 50.55a(a)(3)(i) relief is requested to use a length sizing qualification criteria of 0.75 inch Root Mean Square Error (RMSE). These examinations will be performed during the third inspection interval for Millstone Unit No. 2 and the second inspection interval for Millstone Unit No. 3.

Basis for Relief:

On January 12, 2000, the Regulatory Commission (NRC) Staff, representatives from the Electric Power Research Institute (EPRI) Nondestructive Examination Center, and representatives from the Performance Demonstration Initiative (PDI) participated in a conference call. The discussion during the conference call included the difference between Supplement 4, "Qualification Requirements for the Clad / Basemetal Interface of Reactor Vessel," to Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems," Paragraph 10 CFR 50.55a(b)(2)(xv)(C)(1) in the rule (Federal Register, 64 FR 51370), and the implementation of Supplement 4 by the PDI Program. Supplement 4, Subparagraph 3.2(b) imposed a flaw sizing tolerance of  $-1/4$  inch,  $+1.0$  inch of the true length to the performance demonstration qualification criteria. The rule changed Subparagraph 3.2(b) to a depth sizing requirement of 0.15 inch RMS, and the PDI program uses a length sizing tolerance of 0.75 inch RMSE for paragraph 3.2(b). The NRC staff acknowledged that Paragraph 10 CFR 50.55a(b)(2)(xv)(C)(1) in the rule

was an error and should actually be a length sizing tolerance of 0.75 inch RMS, the same tolerance that is being implemented by the PDI program.

The U.S. nuclear utilities created the PDI to implement demonstration requirements contained in Appendix VIII. PDI developed a performance demonstration program for qualifying UT techniques. In 1995, the NRC staff performed an assessment of the PDI program and reported that PDI was using a length sizing tolerance of 0.75 inch RMS for reactor pressure vessel performance demonstrations. This criterion was introduced to reduce testmanship (passing the test based on manipulation of results rather than skill). The staff noted in the assessment report dated, March 6, 1996, that the length sizing tolerance was not according to Appendix VIII, but did not take exception to PDI's implementation of the 0.75 inch RMS length sizing tolerance. The staff requested that the length sizing difference between PDI and the Code be resolved.

The solution for resolving the differences between the PDI program and the Code was for PDI to participate in development of a Code Case that reflected PDI's program. The Code Case was presented to ASME for discussion and consensus building. NRC representatives participated in this process. ASME approved the Code Case and published it as Code Case N-622, "Ultrasonic Examination of RPV and Piping, Bolts and Studs, Section XI, Division 1."

Operating in parallel with the actions of PDI, the staff incorporated most of Code Case N-622 criteria in the rule published in the Federal Register, 64 FR 51370. In a conference call on January 12, 2000, PDI identified the omission of the length sizing tolerance in Paragraph 10 CFR 50.55a(b)(2)(xv)(C)(1) of the rule. The staff agreed that the omission of the length sizing tolerance 0.75 inch RMS in the rule was an oversight, and the inclusion of depth sizing tolerance to Paragraph 3.2(b) of Supplement 4 to Appendix VIII was an error.

#### Proposed Alternative Examination:

In lieu of the length sizing requirements of the ASME Section XI, 1995 Edition, 1996 Addenda, Appendix VIII, Supplement 4, Subparagraph 3.2(b) and Paragraph 10 CFR 50.55a(b)(2)(xv)(C)(1), a length sizing qualification criteria of 0.75 inch RMSE as implemented by PDI will be used.

#### References:

1. NRC Assessment of the PDI Program, Jack R. Strosnider, Chief Materials and Chemical Engineering Branch, to Bruce J. Sheffel, Chairman, PDI, March 6, 1996, Table 2, Item 94-005, p34.
2. Meeting Summary, Teleconference between NRC and representatives from PDI, D. G. Naujock, Metallurgist, NDE & Metallurgy Section, to Edmund J. Sullivan, Chief NDE & Metallurgy Section, Chemical Engineering Branch, Division of Engineering, U.S. NRC, March 6, 2000.

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Attachment 2

Millstone Nuclear Power Station, Unit Nos. 2 and 3

Relief Request Nos. RR-89-31 and IR-2-16  
Austenitic Welds Single Side Access

**Relief Request Nos. RR-89-31 and IR-2-16**  
**Austenitic Welds Single Side Access**

Relief Request Nos.: RR-89-31 (Millstone Unit No. 2)  
IR-2-16 (Millstone Unit No. 3)

Code Class: 1 and 2

Code Categories: B-J, Pressure Retaining Welds in Piping,  
C-F-1, Pressure Retaining Welds in Austenitic Stainless Steel or  
High Alloy Piping

Code Item Nos.: B9.10, Nominal Pipe Size (NPS) 4 inch or Larger,  
B9.30, NPS 4 inch or Larger Branch Pipe Connection Welds,  
C5.10 Piping Welds (PW) Greater or Equal to 3/8 inch Nominal  
Wall Thickness (NWT) for Piping Greater Than 4 inch,  
C5.20 PW Greater Than 1/5 inch NWT for Piping Greater or Equal  
to NPS 2 inch and Greater or Equal to NPS 4 inch.

Code Requirement:

10 CFR 50.55a(b)(2)(xv)(A), requires the following examination coverage when applying Supplement 2 to Appendix VIII:

1. Piping must be examined in two axial directions and when examination in the circumferential direction is required, the circumferential examination must be performed in two directions, provided access is available.
2. Where examination from both sides is not possible, full coverage credit may be claimed from a single side for ferritic welds. Where examination from both sides is not possible on austenitic welds, full coverage credit from a single side may be claimed only after completing a successful single sided Appendix VIII demonstration using flaws on the opposite side of the weld.

10 CFR 50.55a(b)(2)(xvi)(B), requires that examinations performed from one side of a ferritic or stainless steel pipe weld must be conducted with equipment, procedures, and personnel that have demonstrated proficiency with single side examinations. To demonstrate equivalency to two sided examinations, the demonstration must be performed to the requirements of Appendix VIII as modified by this paragraph and §50.55a(b)(2)(xv)(A).

System/Component(s) for Which Relief is Requested:

Components with single side access, subject to ultrasonic examination with Supplement 2 of Appendix VIII to the 1995 Edition with 1996 Addenda of ASME Section XI.

Code Relief Requested:

Pursuant to 10 CFR 50.55a(g)(6)(i), relief is requested from the new examination coverage and qualification demonstration requirements for austenitic piping welds with single side access. These examinations will be performed during the third inspection interval for Millstone Unit No. 2 and the second inspection interval for Millstone Unit No. 3.

Basis for Relief:

The Final Rule requires that if access is available, the weld shall be scanned in each of the four directions (parallel and perpendicular to the weld) where required. Coverage credit may be taken for single side exams on ferritic piping. However, for austenitic piping, a procedure must be qualified with flaws on the inaccessible side of the weld. There are currently no qualified single side examination procedures that demonstrate equivalency to two-sided examination procedures on austenitic piping welds. Current technology is not capable of reliably detecting or sizing flaws on the far side of an austenitic weld for configurations common to US nuclear applications.

The PDI Program conforms with the Final Rule regarding single side access for piping. PDI Performance Demonstration Qualification Summary (PDQS) certificates for austenitic piping list the limitation that single side examination is performed on a best effort basis. The best effort qualification is provided in place of a complete single side qualification to demonstrate that the examiners qualification and the subsequent weld examination is based on application of the best available technology.

When the examination area is limited to one side of an austenitic weld, examination coverage does not comply with 10 CFR 50.55a(b)(2)(xv)(A) and proficiency demonstrations do not comply with 10 CFR 50.55a(b)(2)(xvi)(B) and full coverage credit may not be claimed.

Proposed Alternative Examination:

The best available techniques, as qualified through the PDI for Supplement 2 with demonstrated best effort for single side examination, will be used from the accessible side of the weld.

NNECO will document the affected austenitic welds for which best effort one sided exams are encountered on the OAR-1 form (Code Case N-532) and submit this at the end of each inspection period.

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Attachment 3

Millstone Nuclear Power Station, Unit Nos. 2 and 3

Relief Request Nos. RR-89-32 and IR-2-17  
Annual Ultrasonic Retraining

**Relief Request Nos. RR-89-32 and IR-2-17**  
**Annual Ultrasonic Retraining**

**Relief Request Nos.:** RR-89-32 (Millstone Unit No. 2)  
IR-2-17 (Millstone Unit No. 3)

**Code Class:** 1 and 2

**Code Category:** Various

**Code Item No.:** All components subject to ultrasonic examination in accordance with the 1995 Edition and 1996 Addenda of ASME Section XI, Appendix VIII.

**Code Requirement:**

The 1995 Edition and 1996 Addenda of ASME Section XI, Subarticle VII-4240 requires a minimum of 10 hours of annual training.

10 CFR 50.55a(b)(2)(xiv) requires that all personnel qualified for performing ultrasonic examinations in accordance with Appendix VIII shall receive 8 hours of annual hands-on training on specimens that contain cracks. This training must be completed no earlier than 6 months prior to performing ultrasonic examinations at a licensee's facility.

**Code Relief Requested:**

Relief is requested in accordance with 10 CFR 50.55a(a)(3)(i) from the provisions of Subarticle VII-4240, Annual Training. These examinations will be performed during the third inspection interval for Millstone Unit No. 2 and the second inspection interval for Millstone Unit No. 3.

**Basis for Relief:**

10 CFR 50.55a was amended in the Federal Register (Volume 64, No. 183 dated September 22, 1999) to require the 1995 Edition, with the 1996 Addenda of Section XI for Appendix VIII qualification requirements. This also imposes the requirements of Appendix VII of the 1995 Edition, with 1996 Addenda of Section XI. This includes Subarticle VII-4240, which requires a minimum of 10 hours of annual training.

10 CFR 50.55a(b)(2)(xiv) requires that all personnel qualified for performing ultrasonic examinations in accordance with Appendix VIII shall receive 8 hours of annual hands-on training on specimens that contain cracks. This training must be completed no earlier than 6 months prior to performing ultrasonic examinations at a licensee's facility.

Paragraph 2.4.1.1.1 in the Federal register contained the following statements,

"The NRC had determined that this requirement (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 within approximately 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 proper skill level."

"... The PDI 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 Sec. 50.55a(b)(2)(xiv) of the final rule."

Implementation of the requirements contained in ASME Section XI and the Final Rule will result in redundant systems. The use of the Final Rule requirements in lieu of additional Appendix VII requirements will simplify record keeping, satisfy the goal of maintaining ultrasonic examiner proficiency, and provide an acceptable level of safety.

Proposed Alternative Examination:

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

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Attachment 4

Millstone Nuclear Power Station, Unit Nos. 2 and 3

Relief Request Nos. RR-89-33 and IR-2-18

Continue Using ASNT SNT-TC-1A for Ultrasonic Personnel

**Relief Request Nos. RR-89-33 and IR-2-18**  
**Continue Using ASNT SNT-TC-1A for Ultrasonic Personnel**

**Relief Request Nos.:** RR-89-33 (Millstone Unit No. 2)  
IR-2-18 (Millstone Unit No. 3)

**Code Class:** 1 and 2

**Code Category:** Various

**Code Item No.:** All components subject to ultrasonic examination with Appendix VIII to the 1995 Edition with 1996 Addenda of ASME Section XI.

**Code Requirement:**

10 CFR 50.55a(g)(6)(ii)(C) requires implementation of the ASME Code, Section XI, 1995 Edition, 1996 Addenda, with an expedited implementation for Appendix VIII ultrasonic examinations. The Supplements to Appendix VIII of Section XI, Division 1, 1995 Edition with the 1996 Addenda of the ASME Boiler and Pressure Vessel Code must be implemented in accordance with the following schedule:

Supplements 1, 2, 3, and 8	May 22, 2000;
Supplements 4 and 6	November 22, 2000;
Supplement 11	November 22, 2001;
Supplements 5, 7, 10, 12, and 13	November 22, 2002.

Related Subarticle IWA-2300, of the 1995 Edition, 1996 Addenda of ASME Section XI requires qualification of examiners to CP-189 as amended by Division 1.

The 1989 Edition of ASME Section XI, Subarticle IWA-2300, defines the qualification requirements for nondestructive examination (NDE) personnel as ASNT SNT-TC-1A, 1984, and the additional requirements of Division 1, including Appendix I.

**Code Relief Requested:**

Pursuant to 10 CFR 50.55a(a)(3)(i), relief is requested to continue basing all requirements for initial certification and re-certification of ultrasonic examination personnel in accordance with the 1989 Edition of Section XI. This includes use of ASNT SNT-TC-1A, 1984, as amended by IWA-2300 and Appendix VII of Section XI, 1989 Edition. These exams will be performed during the third inspection interval for Millstone Unit No. 2 and the second inspection interval for Millstone Unit No. 3.

**Basis for Relief:**

The 1989 Edition of ASME Section XI, Subarticle IWA-2300, requires qualification of NDE personnel using a written practice prepared in accordance with ASNT SNT-TC-1A, 1984, and the additional requirements of Division 1, including Appendix I.

10 CFR 50.55a was amended in the Federal Register (64 FR 51370) to require the 1995 Edition, with the 1996 Addenda of Section XI, with an expedited implementation schedule for Appendix VIII qualification requirements. This imposed the requirements of Appendix VII of the 1995 Edition, with 1996 Addenda of Section XI. This includes Subarticle IWA-2300, which requires a written practice prepared in accordance with CP-189, 1991, as amended by the requirements of Division 1. Paragraph IWA-2310 in the 1995 Edition with 1996 Addenda states that certifications based on SNT-TC-1A are valid until re-certification is required, so current certifications are not affected.

This requires development, implementation, and to the extent possible consolidation of a multifaceted written practice, specific to Ultrasonic examination personnel, to address the various requirements contained in SNT-TC-1A and CP-189, as amended by different Editions and Addenda of Section XI, including IWA-2300 and Appendix VII.

Regardless of whether CP-189 or ASNT SNT-TC-1A is the base document used to prepare the written practice, all personnel conducting ultrasonic examinations to Appendix VIII requirements must be qualified in accordance with Appendix VIII and all personnel qualified through the PDI program must be qualified in accordance with Appendix VII. (Other NDE examiners, with the exception of IWE/IWL, will continue to be certified with a written practice developed in accordance with ASNT SNT-TC-1A.)

A direct comparison of the implementation requirements for Appendix VIII examinations using the 1984 Edition of SNT-TC-1A as modified by IWA-2300 and Appendix VII of the 1989 Edition of Section XI with the 1991 Edition of CP-189 as modified by IWA-2300 and Appendix VII of the 1995 Edition and 1996 Addenda of Section XI is considered to be unwieldy. Therefore, three less complex comparisons of technically significant items are attached. Qualifications of ultrasonic examination personnel to SNT-TC-1A and the additional requirements of the 1989 Edition of Section XI, including Appendix VII are considered equivalent to Qualification to CP-189 as amended by the 95/96 Edition of Section XI.

In lieu of maintaining redundant, possibly conflicting programs, the proposed alternative of maintaining the current program for qualifications of UT personnel will simplify record keeping, satisfy the need to maintain personnel qualifications, eliminate redundant systems, and provide an acceptable level of quality and safety commensurate with the other NDE disciplines.

#### Proposed Alternative Examination:

Initial certification and re-certification of NDE personnel shall continue to be conducted in accordance with the requirements contained in the 1989 Edition of ASME Section XI. Personnel performing ultrasonic examinations shall also meet the requirements specified in 10 CFR 50.55a as amended by 64 FR 51370 which sets forth the requirements for the qualification of personnel by demonstration. The combination of a written practice based on SNT-TC-1A and a performance based demonstration for personnel performing ultrasonic examination of welds or components will continue to ensure the structural integrity of the systems/components.

### Comparison Summary

1. The first comparison, in Table 4-1, is of IWA-2300 from the 1995 Edition with the 1996 Addenda to the 1989 Edition. The major difference is the specification of CP-189 as opposed to SNT-TC-1A:

While CP-189 is a "standard" and SNT-TC-1A is a "recommended practice", this has no technical impact on the implementation of SNT-TC-1A. The "recommended practices" defined by the use of the word "should" in SNT-TC-1A are treated as requirements by the licensee.

2. The second comparison, Table 4-2, is of Appendix VII to the 95/96 Addenda with the 1989 Edition. There is little technical difference between the 1989 and 95/96 Editions. Both modify CP-189 and SNT-TC-1A as required to comply with Section XI, for example:

SNT-TC-1A contains simultaneous experience provisions that are not allowed by Appendix VII.

3. The last comparison in Table 4-3 is of the 1991 Edition of CP-189 with the 1984 Edition of SNT-TC-1A as modified by Appendix VII, the major differences are mitigated by additional requirements contained in Section XI, for example:

CP-189 requires a "written practical", (procedure preparation), and a "demonstration practical" for Level III personnel performing test or evaluating test results. This has no impact on Appendix VIII personnel, though not required by SNT-TC-1A, Appendix VIII requires a "practical" examination for a qualified examiner regardless of Level.

CP-189 defines several additional terms such as Closed Book examination, Documented, Education, Evaluation, Examination, Experience, General examination, Indication, Interpretation, Method, NDT Instructor, Practical Examination, Procedure, and Test Technique. These definitions are consistent with common usage as applied to SNT-TC-1A and Section XI. Where deemed necessary, ASME Section XI has provided compensation. For example the term "Outside Agency" is included in the 95/96 Edition to compensate because it is included in SNT-TC-1A but not in CP-189, conversely the 1989 Edition defines an NDE instructor that is not included in SNT-TC-1A.

There are major differences between CP-189 and SNT-TC-1A. However, as illustrated in the comparisons, these are minimized by the moderating effects of the applicable IWA-2300 requirements and especially Appendix VII requirements. Qualifications of ultrasonic examination personnel to SNT-TC-1A and the additional requirements of the 1989 Edition of Section XI, including Appendix VII are considered equivalent to Qualification to CP-189 as amended by the 95/96 Edition of Section XI.

**Table 4-1: Comparison of the Qualification and Certification Requirements of Ultrasonic Examiners Certified to CP-189, 1991, and SNT-TC-1A, 1984, as Modified by IWA and Appendix VII of 1989 and 95/96 Edition of Section XI Respectively**

The following is a summary of pertinent technical aspects of the implementation requirements contained in Subparagraph IWA-2300 to the two Editions of ASME Section XI identified below.

The comparison is complicated because some of the requirements may be modified or omitted, simply because they are defined in another location or by another document. Several requirements, such as those for limited certification, differ somewhat, but the differences are not considered technically relevant and they are not detailed in this technical comparison. These complications are representative of the increased burden when administering more than one program or a program based on varying requirements.

<b>Table 4-1</b>	
<b>1995 Edition with 1996 Addenda of Section XI</b>	<b>1989 Edition of Section XI</b>
IWA-2310 - Written practice is prepared using ANSI/ASNT "Standard" CP-189, 1991 Edition. Certifications based on SNT-TC-1A remain valid until re-certification.	IWA-2310 - Written practice is prepared using ASNT "Recommended Practice" SNT-TC-1A, 1984 Edition. Certifications based on earlier editions remain valid until re-certification.
IWA-2311 - The written practice shall specify the duties and responsibilities of the Principle Level III.	
IWA-2312 - NDE methods listed in CP-189 - Similar to 1989 IWA-2311.	IWA-2311 - NDE methods listed in SNT-TC-1A - Similar to 95/96 IWA 2312.
IWA-2313 - NDE methods not listed in CP-189 - Similar to 1989 IWA-2312.	IWA-2312 - NDE methods not listed in SNT-TC-1A - Similar to 1989 IWA 2313.
IWA-2314 — Level I and II re-certified every 3 years, Level III every 5 years by examination per CP-189. ASNT Level III not required.	IWA-2313 — Level I and II re-certified every 3 years, Level III every 5 years by examination per SNT-TC-1A.
IWA-2321 — Snellen 20/25 using lower case letters with a known pre-measured height (see IWA-2322). Administered in accordance with a procedure, and by personnel approved by an NDE Level III designated by the employer.	IWA-2321- Jaeger number 1 or equivalent, conducted by personnel qualified to conduct the examinations.
IWA-2322 — Requires use of 10x magnifier to measure height of letters.	

<b>Table 4-1</b>	
<b>1995 Edition with 1996 Addenda of Section XI</b>	<b>1989 Edition of Section XI</b>
IWA-2323 - Level III qualifications evaluated by Basic, Method, Specific, and Practical examinations and the Demonstration examination (Level II Practical).	IWA-2322 - Level III qualifications determined by Basic, Method, and Specific examinations per SNT-TC-1A. (Demonstration examination would be required by Section XI, Appendix VIII).
CP-189 General, Specific and Practical examinations administered and graded by a Level III.	IWA-2323 - Level I and II qualifications determined by General and Specific examinations, and a Practical hands-on examination administered by a Level III.
95/96 Appendix VII is similar to 1989 Appendix VII (See detailed comparison following).	IWA-2324 - Defines requirements for administration of examinations. This is Modified by Appendix VII.
IWA-2330 - Level I responsibilities. Identical to 1989 IWA-2330.	IWA-2330 - Level I responsibilities. Identical to 95/96 IWA-2330.
IWA-2340 - Level III education. Similar to 1989 IWA-2340.	IWA-2340 - Level III education. Similar to 95/96 IWA-2340.
IWA-2350 - Defines limited certification. Provides more definition than 1989.	IWA-2350 - Defines limited certification requirements.
IWA-2360 - Allows certification directly to Level II. Defines additional Level III responsibilities.	Appendix VII allows certification directly to Level II. Defines similar Level III responsibilities.
IWA-2370 — Contains experience requirements for Level II candidates.	1989 Appendix VII contains requirements that are more stringent.

**Table 4-2: Comparison of the Qualification and Certification Requirements of Ultrasonic Examiners Certified to Appendix VII of 95/96 and 1989 Edition of Section XI Respectively**

The following is a summary of pertinent technical aspects of the implementation requirements contained in Subparagraph IWA-2300 to the two Editions of ASME Section XI identified below.

The comparison is again complicated because some of the requirements may be modified or omitted, simply because they are defined in another location or by another document. These complications are again representative of the increased burden when administering more than one program or a program based on varying requirements.

<b>Table 4-2</b>	
<b>95/96 Appendix VII</b>	<b>1989 Appendix VII</b>
VII-1000 - Scope - Modifies the requirements of IWA-2300 for Ultrasonic examiners.	VII-1000 - identical to 95/96 Code.
VII-2000 - Qualification Levels - Identifies 5 qualification Levels as defined in CP-189.	VII-2000 - essentially the same. Defines NDE Instructor qualification since it is not included in SNT-TC-1A.
VII-3000 - Written Practice - Defines the written practice, including the definition of an "outside agency," since it is not defined in CP-1 89.	VII-3000 Identical to 95/96 Code except "outside agency" is not defined, since it is included in SNT-TC-1A.
<b>VII-4000 - Qualification Requirements</b>	
CP-189 contains no simultaneous experience provisions.	Table VII-4110-1 states the simultaneous experience provision of SNT-TC-1A is not applicable.
Paragraph VII-4223 requires previously qualified individuals to meet the requirements for training.	Both Appendices in paragraph VII-4300 state that to be considered for examination the Level I, II, and III candidates shall have successfully completed the training required in VII-4200.
Paragraph VII-4240 states that no exam is required for annual re-training.	
Paragraph VII-4310 (a) states that a random selection process must be controlled by the written practice so no individual takes the same examination more than once.	

<b>Table 4-2</b>	
<b>95/96 Appendix VII</b>	<b>1989 Appendix VII</b>
Paragraph VII-4310 (b) allows the use of "grading units" to produce a specimen bank for the practical examination.	
Paragraph VII-4330 (a) Level III examinations per IWA-2300, Basic, Method, Specific, Practical, Demonstration, contains rules for Level II practical examination. An Appendix VIII practical is acceptable.	While the 1989 Appendix VII contains no requirements for a practical examination, it would be required for the mandatory Appendix VIII.
Paragraph VII-4330 (b) allows re-certification of Level III personnel using only the Method and Specific examinations.	IWA-2313 requires re-certification using Basic, Method, and Specific written examinations.
<b>VII-5000 QUALIFICATION RECORDS</b>	Essentially the same
Not addressed	VII-6000 - Defines duties of the ANII
<b>VII SUPPLEMENTS</b>	Essentially the same

**Table 4-3: Comparison of the Qualification and Certification Requirements of Ultrasonic Examiners Certified to CP-189, 1991 and SNT-TC-1A as Modified by Appendix by VII, 1989 Edition**

Comparisons are not detailed in those areas where CP-189 is modified by the requirements of Appendix VII. Please note that the word "should" typically identifies what is considered a requirement in SNT-TC-1A, while CP-189 typically uses the word "shall". Industry practice is to treat SNT-TC-1A recommendations as requirements. Several paragraphs are identified as similar. For example, while SNT-TC-1A does not specifically require suspension of an examiners certification for a lapsed vision examination, as does CP-189, it is industry practice to do so.

<b>Table 4-3</b>	
<b>CP-189</b>	<b>SNT-TC-1 A</b>
1.0 Scope - CP-189 is a standard that establishes the minimum requirements.	1.0 Scope - SNT-TC-1A is a recommended practice establishing guidelines.
2.0 Definitions - More inclusive (19 terms) and more concise. Some Modified by Appendix VII.	2.0 Definitions - Less inclusive (7 terms)
<b>3.0 Levels Of Qualification</b>	
3.1 Classification	Modified by Appendix VII
3.2 Level III	4.3 (3) - Similar to CP-189
3.3 Level II	4.3 (2) - Similar to CP-189
3.4 Level I	Modified by Appendix VII
3.5 Trainee	4.2 Similar to CP-189
3.6 NDE Instructor	Modified by Appendix VII
<b>4.0 Qualification Requirements</b>	
4.1 Training	Modified by Appendix VII
4.2 Experience	Modified by Appendix VII
4.3 Previous Training and Experience	Modified by Appendix VII
4.4 NDT Instructor	Modified by Appendix VII
4.5 Outside services	Modified by Appendix VII
<b>5.0 Qualification And Certification</b>	
5.1 Procedure	Modified by Appendix VII
5.2 Procedure requirements	Modified by Appendix VII
5.3 Approval - "written practice" approved by Level III	Modified by Appendix VII. Requires that "written practice" specify responsibilities.

6.1	Vision	Modified by IWA-2300
6.2	Level III Examination	Modified by Appendix VII
6.3	Level I and II Examination	Modified by Appendix VII
6.4	Administration and grading	Modified by Appendix VII
6.5	Re-examination	Modified by Appendix VII
6.6	Administration of Examinations - prohibits one's self or one's subordinate from preparing or administering an examination.	Not specifically addressed
<b>7.0</b>	<b>Expiration, Suspension, Revocation, and Reinstatement of Employer Certification</b>	
7.1	Expiration	Similar to CP-189
7.2	Suspension	Similar to CP-189
7.3	Revocation	Similar to CP-189
7.4	Reinstatement	Similar to CP-189
<b>8.0</b>	<b>Employer Recertification</b>	
8.1	NDT Level I and II	Modified by Appendix VII
8.2	NDT Level III	Modified by Appendix VII
<b>9.0</b>	<b>Records</b>	
9.1	Responsibility for Documentation	Modified by Appendix VII
9.2	Contents of Certification Record	Modified by Appendix VII