



Nebraska Public Power District
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10CFR50.55a

NLS2004009
February 12, 2004

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

Subject: Inservice Inspection Relief Requests PR-03, RC-06, RC-07, RI-17, RI-31, RI-32
and RI-33
Cooper Nuclear Station, NRC Docket 50-298, DPR-46

The purpose of this letter is to request that the Nuclear Regulatory Commission (NRC) grant the Nebraska Public Power District (NPPD) relief from certain Inservice Inspection (ISI) code requirements for the Cooper Nuclear Station pursuant to 10CFR50.55a.

Relief requests PR-03, RI-17, RI-31, RI-32 and RI-33 are applicable to the third ten-year ISI interval, which ends February 28, 2006. Relief requests RC-06 and RC-07 are applicable to the first ten-year interval of the Containment Inspection Program, which ends April 8, 2007. Attachment 1 provides a summary listing of the relief requests NPPD is submitting to address examination techniques. Attachment 2 contains the individual ISI relief requests. NPPD expects to submit an additional relief request to address the Risk Informed ISI Program in the near future.

NPPD requests NRC approval of these relief requests by October 15, 2004. Approval of the relief requests, where noted in Attachment 1, is needed by that date to accommodate performance of inspections during the Cycle 22 Refueling Outage scheduled to begin in January 2005.

If you should have any questions concerning this matter, please contact Paul V. Fleming at (402) 825-2774.

Sincerely,

Randall K. Edington
Vice President – Nuclear and
Chief Nuclear Officer

/rar

Attachments

AO4.7

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cc: Regional Administrator w/attachments
USNRC - Region IV

Senior Project Manager w/attachments
USNRC - NRR Project Directorate IV-1

Senior Resident Inspector w/attachments
USNRC

NPG Distribution w/o attachments

CNS Records w/attachments

Listing of Inservice Inspection (ISI) Relief Requests

**Cooper Nuclear Station
 Nebraska Public Power District**

Relief Request No.	Subject / Description	Approval Needed by RE22	Attachment 2 Page Numbers
PR-03	Eliminate the removal of bolting, VT-3 visual examination for corrosion, and IWA-3100 evaluation, on leaking bolted connections.	No	1-2
RC-06	Perform a VT-1 or VT-3 visual examination in lieu of a VT-2 visual examination following a repair or replacement.	Yes	3-4
RC-07	In lieu of using the acceptance criteria provided in IWE-3515.1, use the acceptance criteria in Subarticle IWB-3517.1	No	5-6
RI-17	Eliminate disassembling pipe clamp or restraint to examine welded attachments. Examine to maximum extent possible in accordance with applicable Code requirements.	Yes	7-8
RI-31	Austenitic welds that are not accessible from both sides for inspection will be inspected from the one side that is accessible.	Yes	9-11
RI-32	Cooper Nuclear Station will use a depth sizing requirement of 0.15 inch Root Mean Square as an acceptance criteria in lieu of the requirement in Subparagraph 3.2(c) of Supplement 4 of Appendix VIII.	Yes	12-13
RI-33	Alternatives are proposed to the qualification requirements for dissimilar metal piping welds of ASME Section XI, 1995 Edition, 1996 Addenda, Appendix VIII, Supplement 10.	Yes	14-34

RELIEF REQUEST NUMBER: PR-03, REVISION 2

COMPONENT IDENTIFICATION

Code Classes: 1, 2, and 3
References: IWA-5250
Examination Categories: B-P, C-H, and D-A
Item Numbers: B15.10 through B15.71, C7.10 through C7.80, and D1.10
Description: Alternate corrective measures for bolted connections.
Component Numbers: All Class 1, 2, and Class 3 pressure retaining components subject to system pressure testing.

APPLICABLE CODE EDITION AND ADDENDA

1989 Edition, No Addenda

CODE REQUIREMENT

IWA-5250(a)(2) requires, if leakage occurs at a bolted connection, that the bolting be removed, examined by VT-3 visual examination for corrosion, and evaluated in accordance with IWA-3100.

BASIS FOR RELIEF

In the event of a bolted connection leak detected during the conduct of a system pressure test, current ASME Section XI requirements specify that all bolting must be removed for the purpose of a VT-3 visual examination and evaluation. This requires removing the component or piping system from service, which could result in a plant shutdown, a delay of plant startup or, for continued operation, a reduction in plant safety.

Nebraska Public Power District's (NPPD) proposed alternative to requirements of the 1989 Edition of the Code was approved by the Nuclear Regulatory Commission (NRC). Specifically, NPPD would evaluate the bolting to determine its susceptibility to corrosion, perform a more in-depth evaluation as applicable and remove the bolt closest to the source of leakage and evaluate the bolt in accordance with IWA-3100(a).

Since the granting of the above relief, the Section XI Code requirements have changed, making clear the purpose of the examination is to detect degradation of bolting due to leakage from borated systems. The ASME Code Section XI, 1998 Edition, 1999 Addenda, revised Subsubarticle IWA-5250 (a)(2) as follows:

"If leakage occurs at a bolted connection in a system borated for the purpose of controlling reactivity, one of the bolts shall be removed, VT-3 examined, and evaluated in accordance with IWA-3100. The bolt selected shall be one closest to the source of leakage. When the removed

RELIEF REQUEST NUMBER: PR-03, REVISION 2 (Continued)

bolt has evidence of degradation, all remaining bolts in the connection shall be removed, VT-3 examined, and evaluated in accordance with IWA-3100."

Under the revised subsubarticle, this examination is applicable to code piping of borated water systems. Cooper Nuclear Station (CNS) is a boiling water reactor and does not use borated water to control reactivity during normal plant operation. This examination requirement would not be necessary under the 1999 Addenda.

Moreover, CNS experience with bolted connections has not identified any such failures directly attributed to corrosion of the bolting. The majority of leakage identified during testing is from packing leaks but a small percentage is attributed to flange connections and other pressure retaining bolted connections. Usually this leakage is arrested as the plant heats up or other corrective measures are performed to stop the leakage. In those cases where leakage is not arrested based on the above actions, an evaluation is performed and, when necessary, corrective measures are taken.

Compliance with the requirement to remove bolting to perform a VT-3 examination when corrosion is not a factor could unnecessarily subject CNS personnel to additional exposure and the plant to additional outage time. Removal and examination of bolting can also result in a system or portion of a system being placed in an inoperable or degraded condition. In summary, performing Code Requirement would constitute a higher level of risk, unnecessary personnel exposure, and a hardship on the plant without a compensating increase in the level of quality and safety.

Relief is requested in accordance with 10CFR50.55a(a)(3)(ii).

PROPOSED ALTERNATE PROVISIONS

In lieu of the requirements contained in Relief Request PR-03, Revision 1, NPPD will quantify and evaluate bolted connection leakage in accordance with site procedures and provide necessary corrective action. This corrective action may involve rework of the connection.

APPLICABLE TIME PERIOD

Relief is requested for the third ten-year interval of the ISI Program for CNS, which ends on February 28, 2006.

PR-03, Revision 1 was approved by the NRC on October 23, 1997 (TAC No. M94000).

RELIEF REQUEST NUMBER: RC-06, REVISION 1

COMPONENT IDENTIFICATION

Code Class: MC
Reference: IWE-5240
Examination Category: E-P
Item Description: VT-2 Visual Examination
Component Numbers: All

APPLICABLE CODE EDITION AND ADDENDA

1992 Edition, 1992 Addenda

CODE REQUIREMENT

IWE-5240 states that the requirements of IWA-5240 are applicable following repair, replacement, or modification. IWA-5240 requires a VT-2 visual examination in conjunction with the pressure test.

BASIS FOR RELIEF

Subsubarticle IWE-5210 states that except as noted in Subsubarticle IWE -5240, the requirements of Article IWA-5000 are not applicable to Class MC or Class CC components. Subsubarticle IWE-5240 states that the requirements of Paragraph IWA-5246 (corrected to IWA-5240 in the 1993 Addenda) for visual examinations are applicable. Subsubarticle IWA-5240 identifies requirements for the 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 examination are required to be qualified in accordance with Subarticle IWA-2300 of ASME Section XI.

Table IWE-2500-1, Examination Category E-P, Item E9.10, identifies the examination method of 10CFR50 Appendix J and does not identify a VT-2 visual examination. 10CFR50, Appendix J provides requirements for testing, as well as acceptable leakage criteria. These tests are performed by qualified Appendix J test personnel using calibrated equipment to determine leak rate acceptability.

The 1998 Edition of Section XI, Subsubarticle IWE-5240, requires a detailed visual examination (IWE-2310) be performed on areas affected by repair/replacement activities. The requirement was amended by 10CFR50.55a (b)(2)(ix)(F) to require a VT-1 or VT-3 examination.

RELIEF REQUEST NUMBER: RC-06, REVISION 1 (Continued)

Repairs and replacements, including modification, 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 replacement, including performance of nondestructive examinations, to be performed in accordance with the original edition of the Construction Code or Section XI; and requires performance of preservice inspection in accordance with Subsection IWE. The program specifies the repair 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 that may exist in the containment pressure-retaining boundary. In accordance with the requirements of the 1998 Edition of Section XI, Subsubarticle IWE-5240, performance of a VT-1 or VT-3 examination (instead of a VT-2 examination) and compliance with Article IWA-4000 will provide assurance of the structural integrity of the containment pressure-retaining boundary.

Relief is requested in accordance with 10CFR50.55a(a)(3)(i).

ALTERNATIVE EXAMINATIONS

In lieu of performing a VT-2 examination for repair or replacement, a VT-1 or VT-3 examination, as appropriate, will be performed.

APPLICABLE TIME PERIOD

Relief is requested for the first ten-year interval of the Containment Inspection Program at CNS, which ends on April 8, 2007.

PRECEDENT

A similar relief request to perform a VT-1 examination in lieu of performing a VT-2 examination was approved for Sequoyah, Units 1 and 2 (TAC NOS. MA5912 and MA5915) on February 3, 2000.

RELIEF REQUEST NUMBER: RC-07, REVISION 0

COMPONENT IDENTIFICATION

Code Class: MC
Reference: IWE-3515.1
Examination Category: E-G
Item Description: Bolted Connections
Component Numbers: All

APPLICABLE CODE EDITION AND ADDENDA

1992 Edition, 1992 Addenda.

CODE REQUIREMENT

IWE-3515.1 requires that “bolting material shall be examined in accordance with the material specification for defects which may cause the bolted connection to violate either the leak-tight or structural integrity. Defective items shall be replaced.”

BASIS FOR RELIEF

Bolting material specifications provide requirements relative to the base material properties and related fabrication discontinuities. Material specification requirements are generally associated with the chemical composition, mechanical strength, test specimens and dimensional requirements. These qualities provide little or no guidance for the examination of the bolted connection for service-induced degradation. For inservice bolting, examination guidelines and acceptance criteria must be specific to discontinuities which are relevant to continued service.

In lieu of using the acceptance criteria provided in IWE-3515.1, NPPD proposes to use the acceptance criteria for Class 1 pressure retaining bolting. Subparagraph IWB-3517.1, “Standards for Examination Category B-G-1, Pressure Retaining Bolting Greater Than 2 in. in Diameter, and Examination Category B-G-2, Pressure Retaining Bolting 2 in. and Less in Diameter.”

“The following relevant conditions shall require correction to meet the requirements of IWB-3122 prior to service or IWB-3142 prior to continued service;

- a) crack-like flaws that exceed the allowable liner flaw standards of IWB-3515.5;
- b) more than one deformed or sheared thread in zone of thread engagement of bolts, studs or nuts;
- c) localized general corrosion that reduces the bolt or stud cross-sectional area by more than 5%;

RELIEF REQUEST NUMBER: RC-07, REVISION 0 (Continued)

- d) bending, twisting, or deformation of bolts or studs to the extent that assembly or disassembly is impaired;
- e) missing or loose bolts, studs, nuts, or washers;
- f) fractured bolts, studs, or nuts;
- g) degradation of protective coatings on bolting surfaces; or
- h) evidence of coolant leakage near bolting.”

Relief is requested in accordance with 10CFR50.55a(a)(3)(i).

ALTERNATIVE EXAMINATIONS

Bolting material will be examined in accordance with the inservice standards of the 1992 Edition, with 1992 Addenda of ASME Section XI, Subparagraph IWB-3517.1

APPLICABLE TIME PERIOD

Relief is requested for the first ten-year interval of the Containment Inspection Program at CNS, which ends on April 8, 2007.

PRECEDENT

Relief from examining bolting materials in accordance with the material specification in accordance with IWE-3515.1 was approved for Brunswick, Units 1 and 2 (TAC NOS. MA4166 and MA4167) on August 10, 1999.

RELIEF REQUEST NUMBER: RI-17, REVISION 2

COMPONENT IDENTIFICATION

Code Class: 1 and 2
References: Code Case 509
ASME Section XI, 1995 Edition, 1995 Addenda
Examination Category: B-K, C-C, and D-A
Item Numbers: B10.10, B10.20, B10.30, B10.40, C3.10, C3.20, C3.30, C3.40,
D1.10, D1.20, D1.30 and D1.40
Description: Integrally Welded Attachments
Component Numbers: Various

APPLICABLE CODE EDITION AND ADDENDA

1989 Edition, No Addenda

CODE REQUIREMENT

Code Case N-509 states that Class 1 integrally welded attachments shall be examined and tested as specified in ASME Section XI, Table IWB-2500-1, Examination Category B-K.

Code Case N-509, Table 2500-1, Examination Category B-K, requires a surface examination for a 10% sample of welded attachments.

Code Case N-509 states that Class 2 integrally welded attachments shall be examined and tested as specified in ASME Section XI, Table 2500-1, Examination Category C-C.

Code Case N-509, Table 2500-1, Examination Category C-C, requires a surface examination for a 10% sample of welded attachments.

Code Case N-509 states that Class 3 integrally welded attachments shall be examined and tested as specified in ASME Section XI, Table 2500-1, Examination Category D-A.

Code Case N-509, Table 2500-1, Examination Category D-A, requires a visual VT-1 examination fro a 10% sample of welded attachments.

BASIS FOR RELIEF

In Revision 0 of Relief Request RI-17 NPPD requested relief from removing piping clamps to achieve the required 100% examination coverage for integrally welded attachments (shear lugs). The NRC staff concluded that the proposed alternative, in conjunction with the reduction in number of integrally welded attachments examinations allowed by Code Case N-509, did not provide an acceptable level of quality and safety. The relief request was denied. In Relief

RELIEF REQUEST NUMBER: RI-17, REVISION 2 (Continued)

Request RI-17, Revision 1, NPPD requested relief from removing pipe clamps to achieve required examination coverage for four (4) integrally welded attachments. This relief request was granted with the condition that an additional integrally welded attachment be examined.

Revision 1 of RI-17 was submitted on April 23, 1998 and approved by the NRC on March 11, 1999. At that time 10CFR50.55(a) referenced ASME Section XI, Division 1, and included addenda through the 1988 Addenda and editions through the 1989 Edition for Class 1, 2 and 3 components. The 1989 Edition did not contain any provisions to allow examination of integrally welded attachments without removing component support members. In the 1995 Edition, 1995 Addenda, Figures IWB-2500-15, IWC-2500-5 and IWD-2500-1 for welded attachments were modified to add the following note: "Examination of surface areas may be limited to the portions of these areas that are accessible without removal of support members". The 1995 Edition through the 1996 Addenda of ASME Section XI was approved for use in 10CFR50.55a(b)(2) on November 22, 1999 (after relief was granted for RI-17, Revision 1). The 1995 Edition, 1995 Addenda of ASME Section XI incorporates the examination percentages as given in Code Case N-509. These provisions incorporated in the 1995 Edition, 1995 Addenda have remained in the code through the 2001 Edition, 2003 Addenda. Therefore, NPPD requests approval to use the 1995 Edition, 1996 Addenda of ASME Section XI for the examination of welded attachments. The acceptance criteria of the 1995 Edition, 1996 Addenda of Section XI will also be used since it is a related requirement.

Approval is requested under 10CFR50.55a(g)(4)(iv) to use ASME Section XI, 1995 Edition, 1996 Addenda, for the examination and acceptance of Class 1, Class 2 and Class 3 welded attachments.

PROPOSED ALTERNATIVE POSITIONS

NPPD will use ASME Section XI, 1995 Edition, 1996 Addenda, for the examination and acceptance of Class 1, Class 2 and Class 3 welded attachments.

APPLICABLE TIME PERIOD

Relief is requested for the third ten-year interval of the Inservice Inspection Program for CNS, which ends on February 28, 2006.

RI-17, Revision 0 was denied by the NRC on October 23, 1997 (TAC No. M94000).

RI-17, Revision 1 was approved by the NRC on March 11, 1999 (TAC No. MA2138)

RELIEF REQUEST NUMBER: RI-31

COMPONENT IDENTIFICATION

Code Class: 1
Reference: IWB-2500-1
Examination Category: B-F, B-J
Item Description: Single Side Volumetric Examination
Component Numbers: See Table RI-31

APPLICABLE CODE EDITION AND ADDENDA

1995 Edition, 1996 Addenda

CODE REQUIREMENT

10CFR50.55a (b)(2)(xv)(A), requires, in part, the following examination coverage when applying Supplement 2 to ASME Section XI, 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 for 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 a flaw on the opposite side of the weld.
3. 10CFR50.55a(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).

BASIS FOR RELIEF

10CFR50.55a(b)(2)(xvi)(A) 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 a flaw 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

RELIEF REQUEST NUMBER: RI-31 (Continued)

detecting or sizing flaws on the far side of an austenitic weld for configurations common to domestic commercial nuclear application.

The Electric Power Research Institute Performance Demonstration Initiative (PDI) Program conforms with the 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 examiner 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 10CFR50.55a(b)(2)(xv)(A) and proficiency demonstration does not comply with 10CFR50.55a(b)(2)(xvi)(A) full coverage credit may not be claimed.

Pursuant to 10CFR50.55a(g)(6)(i), relief is requested from the examination coverage and qualification demonstration requirements for austenitic piping welds with single sided access based on the requirements being impractical. A list of the affected welds is provided in Table RI-31-1.

ALTERNATIVE EXAMINATIONS

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.

APPLICABLE TIME PERIOD

Relief is requested for the third ISI ten-year interval at CNS, which ends February 28, 2006.

RELIEF REQUEST NUMBER: RI-31 (continued)
TABLE RI-31-1
ESTIMATED UT EXAMINATION COVERAGE

WELD ID	CONFIGURATION	SIZE	ISO	SYSTEM	EXAM PERIOD	PERCENT COVERAGE
RAS-BJ-9	Tee to Elbow	20	CNS-RR-37	RR	1	50
RAS-BJ-5	P90 to Valve*	28	CNS-RR-37	RR	N/A	50
RAS-BJ-6	Valve to Pipe	28	CNS-RR-37	RR	N/A	50
RAS-BJ-8	Elbow to Pump	28	CNS-RR-37	RR	N/A	50
RAD-BJ-1	Pump to Pipe	28	CNS-RR-37	RR	3	50
RAD-BJ-2	Pipe to Valve	28	CNS-RR-37	RR	3	50
RAD-BJ-3	Valve to Pipe 90*	28	CNS-RR-37	RR	3	50
RAD-BJ-6	Tee to Pipe	24	CNS-RR-37	RR	3	50
RAH-BJ-1	Cross to Header	22	CNS-RR-37	RR	N/A	50
RAH-BJ-2	Cross to Header	22	CNS-RR-37	RR	N/A	50
RRG-BJ-3	Header to Pipe	12	CNS-RR-37	RR	N/A	50
RRK-BJ-3	Header to Pipe	12	CNS-RR-37	RR	N/A	50
RBS-BJ-5	P90 to Valve*	28	CNS-RR-38	RR	N/A	50
RBS-BJ-6	Valve to Pipe	28	CNS-RR-38	RR	N/A	50
RBS-BJ-8	Elbow to Pump	28	CNS-RR-38	RR	N/A	50
RBD-BJ-1	Pump to Pipe	28	CNS-RR-38	RR	N/A	50
RBD-BJ-2	Pipe to Valve	28	CNS-RR-38	RR	N/A	50
RBD-BJ-3	Valve to Pipe	28	CNS-RR-38	RR	N/A	50
RBD-BJ-6	Tee to Pipe	24	CNS-RR-38	RR	2	50
RBH-BJ-1	Cross to Header	22	CNS-RR-38	RR	N/A	50
RBH-BJ-2	Cross to Header	22	CNS-RR-38	RR	N/A	50
RRB-BJ-3	Header to Pipe	12	CNS-RR-38	RR	N/A	50
RRD-BJ-3	Header to Pipe	12	CNS-RR-38	RR	N/A	50
CSA-BJ-14	Valve to Pipe	6	2502-1	CS	N/A	50
CSB-BJ-13	Valve to Pipe	6	2502-1	CS	N/A	50
CWA-BJ-4	P90 to Valve*	6	2503-1	RWCU	3	50
CWA-BJ-5	Valve to P90*	6	2503-1	RWCU	3	50
CWA-BJ-17	P90 to Valve*	6	2503-1	RWCU	N/A	50
CWA-BJ-18	Valve to Pipe	6	2503-1	RWCU	N/A	50
CWA-BJ-16	Pipe to Valve	6	2503-1	RWCU	N/A	50

* - "P90" indicates a section of piping bent during fabrication

RELIEF REQUEST NUMBER: RI-32

COMPONENT IDENTIFICATION

Code Class: 1
Reference: ASME Section XI, Appendix VIII
Examination Category: B-F
Item Numbers: B5.10
Description: Appendix VIII, Supplement 4
Component Numbers: All

APPLICABLE CODE EDITION AND ADDENDA

1989 Edition, No Addenda and 1995 Edition, 1996 Addenda

CODE REQUIREMENT

Appendix VIII, Supplement 4, Subparagraph 3.2(c), requires that performance demonstration results when plotted on a two-dimensional plot with the depth estimated by ultrasonics plotted along the ordinate and the true depth plotted along the abscissa, satisfy the following statistical parameter:

1. the slope of the linear regression line is not less than 0.7;
2. the mean deviation of flaw depth is less than 0.25 in.;
3. correlation coefficient is not less than 0.70.

BASIS FOR RELIEF

The linear regression line (Subparagraph 3.2(c)(1)) is the difference between measured and true value plotted along a through-wall thickness. For Supplement 4 performance demonstration, a linear regression line of the data is not applicable because the performance demonstrations are performed on test specimens with flaws located in the inner 15 percent of wall thickness. The differences between measured versus true value produce a tight grouping of results which resemble a shotgun pattern. The slope of a regression line from such data is extremely sensitive to small variations, thus making the parameter of Subparagraph 3.2(c)(1) a poor and inappropriate acceptance criteria. The second parameter, 3.2(c)2, pertains to the mean deviation of the flaw depth. The value used in the Code is too lax with respect to evaluating flaw depths within the inner 15 percent of wall thickness. Therefore, the Electric Power Research Institute Performance Demonstration Initiative Program proposes to use the more appropriate criterion of 0.15 inch Root Mean Square (RMS) of 10CFR50.55a(b)(2)(xv)(C)(1), which modifies Subparagraph 3.2(a), as the acceptance criterion. The third parameter, 3.2(c)(3), pertains to a correlation coefficient. The value of the correlation coefficient in Subparagraph 3.2(c)(3) is

RELIEF REQUEST NUMBER: RI-32 (Continued)

inappropriate for this application since it is based on the linear regression from Subparagraph 3.2(c)(1).

Relief is requested in accordance with 10CFR50.55a(a)(3)(i).

ALTERNATIVE EXAMINATIONS

NPPD will use 0.15 inch RMS as an acceptance criteria rather than Subparagraph 3.2(c) of Supplement 4 of Appendix VIII.

APPLICABLE TIME PERIOD

Relief is requested for the third ten-year ISI interval at CNS, which ends on February 28, 2006.

PRECEDENT

A similar relief request was approved for Salem and Hope Creek, Units 1 and 2 (TAC NOS. MB1399, MB1400 and MB1401) on March 26, 2001.

RELIEF REQUEST NUMBER: RI-33

COMPONENT IDENTIFICATION

Code Class: 1
Reference: ASME Section XI, Appendix VIII
Examination Category: B-F
Item Number: B5.10
Description: Appendix VIII, Supplement 10
Component Numbers: All

APPLICABLE CODE EDITION AND ADDENDA

1989 Edition, No Addenda and 1995 Edition, 1996 Addenda

CODE REQUIREMENT

The following paragraphs or statements are from ASME Section XI, Appendix VIII, Supplement 10 and identify the specific requirements that are included in this request for relief.

Item 1 - Paragraph 1.1(b) states in part - Pipe diameters within a range of 0.9 to 1.5 times a nominal diameter shall be considered equivalent.

Item 2 - Paragraph 1.1(d) states - All flaws in the specimen set shall be cracks.

Item 3 - Paragraph 1.1(d)(1) states - At least 50% of the cracks shall be in austenitic material. At least 50% of the cracks in austenitic material shall be contained wholly in weld or buttering material. At least 10% of the cracks shall be in ferritic material. The remainder of the cracks may be in either austenitic or ferritic material.

Item 4 - Paragraph 1.2(b) states in part - The number of unflawed grading units shall be at least twice the number of flawed grading units.

Item 5 - Paragraph 1.2(c)(1) and 1.3(c) state in part - At least 1/3 of the flaws, rounded to the next higher whole number, shall have depths between 10% and 30% of the nominal pipe wall thickness. Paragraph 1.4(b) distribution table requires 20% of the flaws to have depths between 10% and 30%.

Item 6 - Paragraph 2.0 first sentence states - The specimen inside surface and identification shall be concealed from the candidate.

Item 7 - Paragraph 2.2(b) states in part - The regions containing a flaw to be sized shall be identified to the candidate.

RELIEF REQUEST NUMBER: RI-33 (Continued)

Item 8 - Paragraph 2.2(c) states in part - For a separate length sizing test, the regions of each specimen containing a flaw to be sized shall be identified to the candidate.

Item 9 - Paragraph 2.3(a) states - For the depth sizing test, 80% of the flaws shall be sized at a specific location on the surface of the specimen identified to the candidate.

Item 10 - Paragraph 2.3(b) states - For the remaining flaws, the regions of each specimen containing a flaw to be sized shall be identified to the candidate. The candidate shall determine the maximum depth of the flaw in each region.

Item 11 - Table VIII-S2-1 provides the false call criteria when the number of unflawed grading units is at least twice the number of flawed grading units.

BASIS FOR RELIEF

Item 1 - Proposed alternative to Paragraph 1.1(b):

The specimen set shall include the minimum and maximum pipe diameters and thicknesses for which the examination procedure is applicable. Pipe diameters within 1/2 in. (13 mm) of the nominal diameter shall be considered equivalent. Pipe diameters larger than 24 in. (610 mm) shall be considered to be flat. When a range of thicknesses is to be examined, a thickness tolerance of $\pm 25\%$ is acceptable.

Technical Basis - The change in the minimum pipe diameter tolerance from 0.9 times the diameter to within 1/2 inch of the nominal diameter provides tolerances more in line with industry practice. Though the alternative is less stringent for small pipe diameters they typically have a thinner wall thickness than larger diameter piping. A thinner wall thickness results in shorter sound path distances that reduce the detrimental effects of the curvature. This change maintains consistency between Supplement 10 and the recent revision to Supplement 2.

Item 2 - Proposed alternative to Paragraph 1.1(d):

At least 60% of the flaws shall be cracks, the remainder shall be alternative flaws. Specimens with Intergranular Stress Corrosion Cracking (IGSCC) shall be used when available. Alternative flaws, shall meet the following requirements:

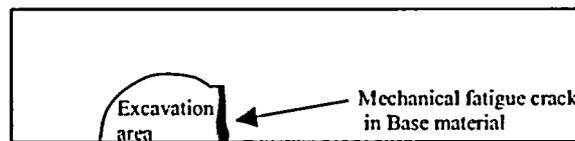
(1) Alternative flaws, if used, shall provide crack-like reflective characteristics and shall only be used when implantation of cracks would produce spurious reflectors that are uncharacteristic of service-induced flaws.

(2) Alternative flaw mechanisms shall have a tip width no more than 0.002 in. (.05 mm).

RELIEF REQUEST NUMBER: RI-33 (Continued)

Note, to avoid confusion the proposed alternative modifies instances of the term “cracks” or “cracking” to the term “flaws” because of the use of alternative flaw mechanisms.

Technical Basis - As illustrated below, implanting a crack requires excavation of the base material on at least one side of the flaw. While this may be satisfactory for ferritic materials, it does not produce a useable axial flaw in austenitic materials because the sound beam, which normally passes only through base material, must now travel through weld material on at least one side, producing an unrealistic flaw response. In addition, it is important to preserve the dendritic structure present in field welds that would otherwise be destroyed by the implantation process. To resolve these issues, the proposed alternative allows the use of up to 40% fabricated flaws as an alternative flaw mechanism under controlled conditions. The fabricated flaws are isostatically compressed which produces ultrasonic reflective characteristics similar to tight cracks.



Item 3 - Proposed alternative to Paragraph 1.1(d)(1):

At least 80% of the flaws shall be contained wholly in weld or buttering material. At least one and no more than 10% of the flaws shall be in ferritic base material. At least one and no more than 10% of the flaws shall be in austenitic base material.

Technical Basis - Under the current Code, as few as 25% of the flaws are contained in austenitic weld or buttering material. Recent experience has indicated that flaws contained within the weld are the likely scenarios. The metallurgical structure of austenitic weld material is ultrasonically more challenging than either ferritic or austenitic base material. The proposed alternative is therefore more challenging than the current Code.

Item 4 - Proposed alternative to Paragraph 1.2(b):

Personnel performance demonstration detection test sets shall be selected from Table VIII-S10-1. The number of unflawed grading units shall be at least 1-1/2 times the number of flawed grading units.

Technical Basis - Table S10-1 provides a statistically based ratio between the number of unflawed grading units and the number of flawed grading units. The proposed alternative reduces the ratio to 1.5 times to reduce the number of test samples to a more reasonable number from the human factors perspective. However, the statistical basis used for screening personnel and procedures is still maintained at the same level with competent personnel being successful

RELIEF REQUEST NUMBER: RI-33 (Continued)

and less skilled personnel being unsuccessful. The acceptance criteria for the statistical basis are in Table VIII-S10-1.

Item 5 - The proposed alternative to the flaw distribution requirements of Paragraph 1.2(c)(1) (detection) and 1.3(c) (length) is to use the Paragraph 1.4(b) (depth) distribution table (see below) for all qualifications.

Flaw Depth (% Wall Thickness)	Minimum Number of Flaws
10-30%	20%
31-60%	20%
61-100%	20%

Technical Basis - The proposed alternative uses the depth sizing distribution for both detection and depth sizing because it provides for a better distribution of flaw sizes within the test set. This distribution allows candidates to perform detection, length, and depth sizing demonstrations simultaneously utilizing the same test set. The requirement that at least 75% of the flaws shall be in the range of 10 to 60% of wall thickness provides an overall distribution tolerance yet the distribution uncertainty decreases the possibilities for testmanship that would be inherent to a uniform distribution. It must be noted that it is possible to achieve the same distribution utilizing the present requirements, but it is preferable to make the criteria consistent.

Item 6 - Proposed alternative to Paragraph 2.0 first sentence:

For qualifications from the outside surface, the specimen inside surface and identification shall be concealed from the candidate. When qualifications are performed from the inside surface, the flaw location and specimen identification shall be obscured to maintain a "blind test."

Technical Basis - The current Code requires that the inside surface be concealed from the candidate. This makes qualifications conducted from the inside of the pipe (e.g., PWR nozzle to safe end welds) impractical. The proposed alternative differentiates between ID and OD scanning surfaces, requires that they be conducted separately, and requires that flaws be concealed from the candidate. This is consistent with the recent revision to Supplement 2.

Items 7 and 8 - Proposed alternatives to Paragraph 2.2(b) and 2.2(c):

"... containing a flaw to be sized may be identified to the candidate."

Technical Basis - The current Code requires that the regions of each specimen containing a flaw to be length sized shall be identified to the candidate. The candidate shall determine the length of the flaw in each region (Note, that length and depth sizing use the term "regions" while detection uses the term "grading units" - the two terms define different concepts and are not intended to be equal or interchangeable). To ensure security of the samples, the proposed alternative modifies

RELIEF REQUEST NUMBER: RI-33 (Continued)

the first “shall” to a “may” to allow the test administrator the option of not identifying specifically where a flaw is located. This is consistent with the recent revision to Supplement 2.

Items 9 and 10 - Proposed alternative to Paragraph 2.3(a) and 2.3(b):

“... regions of each specimen containing a flaw to be sized may be identified to the candidate.”

Technical Basis - The current Code requires that a large number of flaws be sized at a specific location. The proposed alternative changes the “shall” to a “may” which modifies this from a specific area to a more generalized region to ensure security of samples. This is consistent with the recent revision to Supplement 2. It also incorporates terminology from length sizing for additional clarity.

Item 11 - The proposed alternative modifies the acceptance criteria of Table VIII-S2-1 as follows:

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**TABLE VIII-S2-1
 PERFORMANCE DEMONSTRATION DETECTION TEST
 ACCEPTANCE CRITERIA**

Detection Test Acceptance Criteria		False Call Test Acceptance Criteria	
No. of Flawed Grading Units	Minimum Detection Criteria	No. of Unflawed Grading Units	Maximum Number of False Calls
5	5	10	0
6	6	12	1
7	6	14	1
8	7	16	2
9	7	18	2
10	8	20 15	3 2
11	9	22 17	3 3
12	9	24 18	3 3
13	10	26 20	4 3
14	10	28 21	5 3
15	11	30 23	5 3
16	12	32 24	6 4
17	12	34 26	6 4
18	13	36 27	7 4
19	13	38 29	7 4
20	14	40 30	8 5

RELIEF REQUEST NUMBER: RI-33 (Continued)

Technical Basis - The proposed alternative is identified as new Table S10-1 above. It was modified to reflect the reduced number of unflawed grading units and allowable false calls. As a part of ongoing Code activities, Pacific Northwest National Laboratory has reviewed the statistical significance of these revisions and offered the revised Table S10-1.

Pursuant to 10CFR50.55a(a)(3)(i), approval is requested to use the proposed alternative described herein and outlined in Table RI-33-1.

ALTERNATIVE EXAMINATIONS

In lieu of the requirements of ASME Section XI, 1995 Edition, 1996 Addenda, Appendix VIII, Supplement 10, the proposed alternative shall be used. A copy of the proposed alternative is contained in Table RI-33-1.

APPLICABLE TIME PERIOD

Relief is requested for the third ten-year ISI interval at CNS, which ends on February 8, 2006.

PRECEDENT

A similar relief request was approved for Edwin I. Hatch, Units 1 and 2, Joseph M. Farley, Units 1 and 2 and Vogtle, Units 1 and 2 (TAC NOS. MB9023, MB9024, MB9025, MB9026, MB9027 and MB9028) on August 6, 2003.

RELIEF REQUEST RI-33 (Continued)
TABLE RI-33-1

APPENDIX VIII, SUPPLEMENT 10	ALTERNATIVE	BASIS
	1.0 SCOPE	
	Supplement 10 is applicable to dissimilar metal piping welds examined from either the inside or outside surface. Supplement 10 is not applicable to piping welds containing supplemental corrosion resistant clad (CRC) applied to mitigate Intergranular Stress Corrosion Cracking (IGSCC).	A scope statement provides added clarity regarding the applicable range of each individual Supplement. The exclusion of CRC provides consistency between Supplement 10 and the recent revision to Supplement 2 (Reference BC 00-755). Note, an additional change identifying CRC as "in course of preparation" is being processed separately.
1.0 SPECIMEN REQUIREMENTS	2.0 SPECIMEN REQUIREMENTS	Renumbered
Qualification test specimens shall meet the requirements listed herein, unless a set of specimens is designed to accommodate specific limitations stated in the scope of the examination procedure (e.g., pipe size, weld joint configuration, access limitations). The same specimens may be used to demonstrate both detection and sizing qualification.	Qualification test specimens shall meet the requirements listed herein, unless a set of specimens is designed to accommodate specific limitations stated in the scope of the examination procedure (e.g., pipe size, weld joint configuration, access limitations). The same specimens may be used to demonstrate both detection and sizing qualification.	No Change
1.1 General. The specimen set shall conform to the following requirements.	2.1 General. The specimen set shall conform to the following requirements.	Renumbered
	(a) The minimum number of flaws in a specimen set shall be ten.	New, changed minimum number of flaws to 10 so sample set size for detection is consistent with length and depth sizing.

RELIEF REQUEST RI-33 (Continued)
TABLE RI-33-1

APPENDIX VIII, SUPPLEMENT 10	ALTERNATIVE	BASIS
(a) Specimens shall have sufficient volume to minimize spurious reflections that may interfere with the interpretation process.	(b) Specimens shall have sufficient volume to minimize spurious reflections that may interfere with the interpretation process.	Renumbered
(b) The specimen set shall include the minimum and maximum pipe diameters and thicknesses for which the examination procedure is applicable. Pipe diameters within a range of 0.9 to 1.5 times a nominal diameter shall be considered equivalent. Pipe diameters larger than 24 in. shall be considered to be flat. When a range of thicknesses is to be examined, a thickness tolerance of $\pm 25\%$ is acceptable.	(c) The specimen set shall include the minimum and maximum pipe diameters and thicknesses for which the examination procedure is applicable. Pipe diameters within 1/2 in. (13 mm) of the nominal diameter shall be considered equivalent. Pipe diameters larger than 24 in. (610 mm) shall be considered to be flat. When a range of thicknesses is to be examined, a thickness tolerance of $\pm 25\%$ is acceptable.	Renumbered, metricated, the change in pipe diameter tolerance provides consistency between Supplement 10 and the recent revision to Supplement 2 (Reference BC 00-755).
(c) The specimen set shall include examples of the following fabrication condition:	(d) The specimen set shall include examples of the following fabrication conditions:	Renumbered, changed "condition" to "conditions"
(1) geometric conditions that normally require discrimination from flaws (e.g., counterbore or weld root conditions, cladding, weld buttering, remnants of previous welds, adjacent welds in close proximity);	(1) geometric and material conditions that normally require discrimination from flaws (e.g., counterbore or weld root conditions, cladding, weld buttering, remnants of previous welds, adjacent welds in close proximity, weld repair areas);	Clarification, some of the items listed relate to material conditions rather than geometric conditions. Weld repair areas were added as a result of recent field experiences.

RELIEF REQUEST RI-33 (Continued)
TABLE RI-33-1

APPENDIX VIII, SUPPLEMENT 10	ALTERNATIVE	BASIS
(2) typical limited scanning surface conditions (e.g., diametrical shrink, single-side access due to nozzle and safe end external tapers).	(2) typical limited scanning surface conditions shall be included as follows: (a) for outside surface examination, weld crowns, diametrical shrink, single-side access due to nozzle and safe end external tapers (b) for inside surface examination, internal tapers, exposed weld roots, and cladding conditions for inside surface examinations). (e) Qualification requirements shall be satisfied separately for outside surface and inside surface examinations.	Differentiates between ID and OD scanning surface limitations. Requires that ID and OD qualifications be conducted independently (Note, new paragraph 2.0 (identical to old paragraph 1.0) provides for alternatives when “a set of specimens is designed to accommodate specific limitations stated in the scope of the examination procedure.”).
(d) All flaws in the specimen set shall be cracks.		Deleted this requirement, because new paragraph 2.3 below provides for the use of “alternative flaws” in lieu of cracks.
(1) At least 50% of the cracks shall be in austenitic material. At least 50% of the cracks in austenitic material shall be contained wholly in weld or buttering material. At least 10% of the cracks shall be in ferritic material. The remainder of the cracks may be in either austenitic or ferritic material.	2.2 Flaw Location. At least 80% of the flaws shall be contained wholly in weld or buttering material. At least one and no more than 10% of the flaws shall be in ferritic base material. At least one and no more than 10% of the flaws shall be in austenitic base material.	Renumbered and re-titled. Flaw location percentages redistributed because field experience indicates that flaws contained in weld or buttering material are probable and represent the more stringent ultrasonic detection scenario.

RELIEF REQUEST RI-33 (Continued)
TABLE RI-33-1

APPENDIX VIII, SUPPLEMENT 10	ALTERNATIVE	BASIS
<p>(2) At least 50% of the cracks in austenitic base material shall be either IGSCC or thermal fatigue cracks. At least 50% of the cracks in ferritic material shall be mechanically or thermally induced fatigue cracks.</p>	<p>2.3 Flaw Type. (a) At least 60% of the flaws shall be cracks, and the remainder shall be alternative flaws. Specimens with IGSCC shall be used when available. Alternative flaws shall meet the following requirements: (1) Alternative flaws, if used, shall provide crack-like reflective characteristics and shall only be used when implantation of cracks would produce spurious reflectors that are uncharacteristic of service-induced flaws. (2) Alternative flaws shall have a tip width no more than 0.002 in. (.05 mm).</p>	<p>Renumbered and re-titled. Alternative flaws are required for placing axial flaws in the HAZ of the weld and other areas where implantation of a crack produces metallurgical conditions that result in an unrealistic ultrasonic response. This is consistent with the recent revision to Supplement 2 (Reference BC 00-755).</p> <p>The 40% limit on alternative flaws is needed to support the requirement for up to 70% axial flaws. Metricated</p>
<p>(3) At least 50% of the cracks shall be coincident with areas described in (c) above.</p>	<p>(b) At least 50% of the flaws shall be coincident with areas described in 2.1(d) above.</p>	<p>Renumbered. Due to inclusion of "alternative flaws", use of "cracks" is no longer appropriate.</p>

RELIEF REQUEST RI-33 (Continued)
 TABLE RI-33-1

APPENDIX VIII, SUPPLEMENT 10	ALTERNATIVE	BASIS								
	<p>2.4 Flaw Depth. All flaw depths shall be greater than 10% of the nominal pipe wall thickness. Flaw depths shall exceed the nominal clad thickness when placed in cladding. Flaws in the sample set shall be distributed as follows:</p> <table border="0" data-bbox="783 716 1360 910"> <thead> <tr> <th style="text-align: left;">Flaw Depth (% Wall Thickness)</th> <th style="text-align: left;">Minimum Number of Flaws</th> </tr> </thead> <tbody> <tr> <td>10-30%</td> <td>20%</td> </tr> <tr> <td>31-60%</td> <td>20%</td> </tr> <tr> <td>61-100%</td> <td>20%</td> </tr> </tbody> </table> <p>At least 75% of the flaws shall be in the range of 10 to 60% of wall thickness.</p>	Flaw Depth (% Wall Thickness)	Minimum Number of Flaws	10-30%	20%	31-60%	20%	61-100%	20%	<p>Moved from old paragraph 1.3(c) and 1.4 and re-titled. Consistency between detection and sizing specimen set requirements (e.g., 20% vs. 1/3 flaw depth increments, e.g., original paragraph 1.3(c)).</p>
Flaw Depth (% Wall Thickness)	Minimum Number of Flaws									
10-30%	20%									
31-60%	20%									
61-100%	20%									
<p>1.2 Detection Specimens. The specimen set shall include detection specimens that meet the following requirements.</p>		<p>Renumbered and re-titled and moved to paragraph 3.1(a). No other changes.</p>								

RELIEF REQUEST RI-33 (Continued)
TABLE RI-33-1

APPENDIX VIII, SUPPLEMENT 10	ALTERNATIVE	BASIS
(a) Specimens shall be divided into grading units. Each grading unit shall include at least 3 in. of weld length. If a grading unit is designed to be unflawed, at least 1 in. of unflawed material shall exist on either side of the grading unit. The segment of weld length used in one grading unit shall not be used in another grading unit. Grading units need not be uniformly spaced around the pipe specimen.		Renumbered to paragraph 3.1(a)(1). No other changes.
(b) Detection sets shall be selected from Table VIII-S2-1. The number of unflawed grading units shall be at least twice the number of flawed grading units.		Moved to new paragraph 3.1(a)(2).
(c) Flawed grading units shall meet the following criteria for flaw depth, orientation, and type.		Flaw depth requirements moved to new paragraph 2.4, flaw orientation requirements moved to new paragraph 2.5, flaw type requirements moved to new paragraph 2.3, "Flaw Type".

RELIEF REQUEST RI-33 (Continued)
TABLE RI-33-1

APPENDIX VIII, SUPPLEMENT 10	ALTERNATIVE	BASIS
(1) All flaw depths shall be greater than 10% of the nominal pipe wall thickness. At least 1/3 of the flaws, rounded to the next higher whole number, shall have depths between 10% and 30% of the nominal pipe wall thickness. However, flaw depths shall exceed the nominal clad thickness when placed in cladding. At least 1/3 of the flaws, rounded to the next whole number, shall have depths greater than 30% of the nominal pipe wall thickness.		Deleted, for consistency in sample sets the depth distribution is the same for detection and sizing.
(2) At least 30% and no more than 70% of the flaws, rounded to the next higher whole number, shall be oriented axially. The remainder of the flaws shall be oriented circumferentially.	2.5 Flaw Orientation. (a) For other than sizing specimens at least 30% and no more than 70% of the flaws, rounded to the next higher whole number, shall be oriented axially. The remainder of the flaws shall be oriented circumferentially.	Note, this distribution is applicable for detection and depth sizing. Paragraph 2.5(b)(1) requires that all length- sizing flaws be oriented circumferentially.
1.3 Length Sizing Specimens. The specimen set shall include length sizing specimens that meet the following requirements.		Renumbered and re-titled and moved to new paragraph 3.2.
(a) All length sizing flaws shall be oriented circumferentially.		Moved, included in new paragraph 3.2(a).
(b) The minimum number of flaws shall be ten.		Moved, included in new paragraph 2.1 above.

RELIEF REQUEST RI-33 (Continued)
TABLE RI-33-1

APPENDIX VIII, SUPPLEMENT 10	ALTERNATIVE	BASIS
<p>(c) All flaw depths shall be greater than 10% of the nominal pipe wall thickness. At least 1/3 of the flaws, rounded to the next higher whole number, shall have depths between 10% and 30% of the nominal pipe wall thickness. However, flaw depth shall exceed the nominal clad thickness when placed in cladding. At least 1/3 of the flaws, rounded to the next whole number, shall have depths greater than 30% of the nominal pipe wall thickness.</p>		<p>Moved, included in new paragraph 2.4 above after revision for consistency with detection distribution</p>
<p>1.4 Depth Sizing Specimens. The specimen set shall include depth sizing specimens that meet the following requirements.</p>		<p>Moved, included in new paragraphs 2.1, 2.3, 2.4.</p>
<p>(a) The minimum number of flaws shall be ten.</p>		<p>Moved, included in new paragraph 2.1.</p>
<p>(b) Flaws in the sample set shall not be wholly contained within cladding and shall be distributed as follows:</p>		<p>Moved, potential conflict with old paragraph 1.2(c)(1); "However, flaw depths shall exceed the nominal clad thickness when placed in cladding." Revised for clarity and included in new paragraph 2.4.</p>

RELIEF REQUEST RI-33 (Continued)
 TABLE RI-33-1

APPENDIX VIII, SUPPLEMENT 10	ALTERNATIVE	BASIS
<p>Flaw Depth Minimum <u>(% Wall Thickness)</u> <u>Number of Flaws</u></p> <p>10-30% 20% 31-60% 20% 61-100% 20%</p> <p>The remaining flaws shall be in any of the above categories.</p>		<p>Moved, included in paragraph 2.4 for consistent applicability to detection and sizing samples.</p>
	<p>(b) Sizing Specimen sets shall meet the following requirements.</p>	<p>Added for clarity.</p>
	<p>(1) Length-sizing flaws shall be oriented circumferentially.</p>	<p>Moved from old paragraph 1.3(a).</p>
	<p>(2) Depth sizing flaws shall be oriented as in 2.5(a).</p>	<p>Included for clarity. Previously addressed by omission (i.e., length, but not depth had a specific exclusionary statement).</p>

RELIEF REQUEST RI-33 (Continued)
TABLE RI-33-1

APPENDIX VIII, SUPPLEMENT 10	ALTERNATIVE	BASIS
2.0 CONDUCT OF PERFORMANCE DEMONSTRATION	3.0 PERFORMANCE DEMONSTRATION	Renumbered
<p>The specimen inside surface and identification shall be concealed from the candidate. All examinations shall be completed prior to grading the results and presenting the results to the candidate. Divulgence of particular specimen results or candidate viewing of unmasked specimens after the performance demonstration is prohibited.</p>	<p>Personnel and procedure performance demonstration tests shall be conducted according to the following requirements. (a) For qualifications from the outside surface, the specimen inside surface and identification shall be concealed from the candidate. When qualifications are performed from the inside surface, the flaw location and specimen identification shall be obscured to maintain a "blind test". All examinations shall be completed prior to grading the results and presenting the results to the candidate. Divulgence of particular specimen results or candidate viewing of unmasked specimens after the performance demonstration is prohibited.</p>	<p>Differentiate between qualifications conducted from the outside and inside surface.</p>
<p>2.1 Detection Test. Flawed and unflawed grading units shall be randomly mixed.</p>	<p>3.1 Detection Test.</p>	<p>Renumbered, moved text to paragraph 3.1(a)(3).</p>
	<p>(a) The specimen set shall include detection specimens that meet the following requirements.</p>	<p>Renumbered, moved from old paragraph 1.2.</p>

RELIEF REQUEST RI-33 (Continued)
TABLE RI-33-1

APPENDIX VIII, SUPPLEMENT 10	ALTERNATIVE	BASIS
	<p>(1) Specimens shall be divided into grading units.</p> <p>(a) Each grading unit shall include at least 3 in. (76 mm) of weld length.</p> <p>(b) The end of each flaw shall be separated from an unflawed grading unit by at least 1 in. (25 mm) of unflawed material. A flaw may be less than 3 in. in length.</p> <p>(c) The segment of weld length used in one grading unit shall not be used in another grading unit.</p> <p>(d) Grading units need not be uniformly spaced around the pipe specimen.</p>	<p>Renumbered, moved from old paragraph 1.2(a). Metricated. No other changes.</p>
	<p>(2) Personnel performance demonstration detection test sets shall be selected from Table VIII-S10-1. The number of unflawed grading units shall be at least 1-1/2 times the number of flawed grading units.</p>	<p>Moved from old paragraph 1.2(b). Table revised to reflect a change in the minimum sample set to 10 and the application of equivalent statistical false call parameters to the reduction in unflawed grading units. Human factors due to large sample size.</p>
	<p>(3) Flawed and unflawed grading units shall be randomly mixed.</p>	<p>Moved from old paragraph 2.1.</p>

RELIEF REQUEST RI-33 (Continued)
TABLE RI-33-1

APPENDIX VIII, SUPPLEMENT 10	ALTERNATIVE	BASIS
	(b) Examination equipment and personnel are qualified for detection when personnel demonstrations satisfy the acceptance criteria of Table VIII S10-1 for both detection and false calls.	Moved from old paragraph 3.1. Modified to reflect the 100% detection acceptance criteria of procedures versus personnel and equipment contained in new paragraph 4.0 and the use of 1.5X rather than 2X unflawed grading units contained in new paragraph 3.1(a)(2). Note, the modified table maintains the screening criteria of the original Table VIII-S2-1.
2.2 Length Sizing Test	3.2 Length Sizing Test	Renumbered
(a) The length sizing test may be conducted separately or in conjunction with the detection test.	(a) Each reported circumferential flaw in the detection test shall be length-sized.	Provides consistency between Supplement 10 and the recent revision to Supplement 2 (Reference BC 00-755).
(b) When the length sizing test is conducted in conjunction with the detection test, and less than ten circumferential flaws are detected, additional specimens shall be provided to the candidate such that at least ten flaws are sized. The regions containing a flaw to be sized shall be identified to the candidate. The candidate shall determine the length of the flaw in each region.	(b) When the length-sizing test is conducted in conjunction with the detection test, and less than ten circumferential flaws are detected, additional specimens shall be provided to the candidate such that at least ten flaws are sized. The regions containing a flaw to be sized may be identified to the candidate. The candidate shall determine the length of the flaw in each region.	Change made to ensure security of samples, consistent with the recent revision to Supplement 2 (Reference BC 00-755). Note, length and depth sizing use the term "regions" while detection uses the term "grading units". The two terms define different concepts and are not intended to be equal or interchangeable.
(c) For a separate length sizing test, the regions of each specimen containing a flaw to be sized shall be identified to the candidate. The candidate shall determine the length of the flaw in each region.	(c) For a separate length-sizing test, the regions of each specimen containing a flaw to be sized may be identified to the candidate. The candidate shall determine the length of the flaw in each region.	Change made to ensure security of samples, consistent with the recent revision to Supplement 2 (Reference BC 00-755).

RELIEF REQUEST RI-33 (Continued)
TABLE RI-33-1

APPENDIX VIII, SUPPLEMENT 10	ALTERNATIVE	BASIS
	(d) Examination procedures, equipment, and personnel are qualified for length-sizing when the RMS error of the flaw length measurements, as compared to the true flaw lengths, do not exceed 0.75 in. (19 mm).	Moved from old paragraph 3.2(a) includes inclusion of "when" as an editorial change. Metricated.
2.3 Depth Sizing Test	3.3 Depth Sizing Test	Renumbered
(a) For the depth sizing test, 80% of the flaws shall be sized at a specific location on the surface of the specimen identified to the candidate.	(a) The depth-sizing test may be conducted separately or in conjunction with the detection test. For a separate depth-sizing test, the regions of each specimen containing a flaw to be sized may be identified to the candidate. The candidate shall determine the maximum depth of the flaw in each region.	Change made to ensure security of samples, consistent with the recent revision to Supplement 2 (Reference BC 00-755).
(b) For the remaining flaws, the regions of each specimen containing a flaw to be sized shall be identified to the candidate. The candidate shall determine the maximum depth of the flaw in each region.	(b) When the depth-sizing test is conducted in conjunction with the detection test, and less than ten flaws are detected, additional specimens shall be provided to the candidate such that at least ten flaws are sized. The regions of each specimen containing a flaw to be sized may be identified to the candidate. The candidate shall determine the maximum depth of the flaw in each region.	Change made to be consistent with the recent revision to Supplement 2 (Reference BC 00-755). Changes made to ensure security of samples, consistent with the recent revision to Supplement 2 (Reference BC 00-755).

RELIEF REQUEST RI-33 (Continued)
TABLE RI-33-1

APPENDIX VIII, SUPPLEMENT 10	ALTERNATIVE	BASIS
	(c) Examination procedures, equipment, and personnel are qualified for depth sizing when the RMS error of the flaw depth measurements, as compared to the true flaw depths, do not exceed 0.125 in. (3 mm).	Moved from old paragraph 3.2(b). Metricated.
3.0 ACCEPTANCE CRITERIA		Delete as a separate category. Moved to new paragraph detection (3.1) and sizing 3.2 and 3.3
3.1 Detection Acceptance Criteria. Examination procedures, equipment, and personnel are qualified for detection when the results of the performance demonstration satisfy the acceptance criteria of Table VIII-S2-1 for both detection and false calls.		Moved to new paragraph 3.1(b), reference changed to Table S10 from S2 because of the change in the minimum number of flaws and the reduction in unflawed grading units from 2X to 1.5X.
3.2 Sizing Acceptance Criteria		Deleted as a separate category. Moved to new paragraph on length 3.2 and depth 3.3
(a) Examination procedures, equipment, and personnel are qualified for length sizing the RMS error of the flaw length measurements, as compared to the true flaw lengths, is less than or equal to 0.75 inch.		Moved to new paragraph 3.2(d), included word "when" as an editorial change.
(b) Examination procedures, equipment, and personnel are qualified for depth sizing when the RMS error of the flaw depth measurements, as compared to the true flaw depths, is less than or equal to 0.125 in.		Moved to new paragraph 3.3(c)

RELIEF REQUEST RI-33 (Continued)
 TABLE RI-33-1

APPENDIX VIII, SUPPLEMENT 10	ALTERNATIVE	BASIS
	4.0 PROCEDURE QUALIFICATION	New
	<p>Procedure qualifications shall include the following additional requirements.</p> <p>(a) The specimen set shall include the equivalent of at least three personnel performance demonstration test sets. Successful personnel performance demonstrations may be combined to satisfy these requirements.</p> <p>(b) Detectability of all flaws in the procedure qualification test set that are within the scope of the procedure shall be demonstrated. Length and depth sizing shall meet the requirements of paragraph 3.1, 3.2, and 3.3.</p> <p>(c) At least one successful personnel demonstration shall be performed.</p> <p>(d) To qualify new values of essential variables, at least one personnel qualification set is required. The acceptance criteria of 4.0(b) shall be met.</p>	<p>New. Based on experience gained in conducting qualifications, the equivalent of 3 personnel sets (i.e., a minimum of 30 flaws) is required to provide enough flaws to adequately test the capabilities of the procedure. Combining successful demonstrations allows a variety of examiners to be used to qualify the procedure. Detectability of each flaw within the scope of the procedure is required to ensure an acceptable personnel pass rate. The last sentence is equivalent to the previous requirements and is satisfactory for expanding the essential variables of a previously qualified procedure</p>

