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SCHWENCER,A. Licensing Branch 2

SUBJECT: Requests approval to use portions of later addenda of ASME Section XI requirements re selection & exam of Class 2 piping (Category CF only) for inservice insp program. Proposed code case encl.

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Washington Public Power Supply System
P.O. Box 968 3000 George Washington Way Richland, Washington 99352 (509) 372-5000

March 20, 1984
G02-84-156

Docket No. 50-397

Director of Nuclear Reactor Regulation
Attention: Mr. A. Schwencer
Chief Licensing Branch No. 2
Division of Licensing
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Schwencer:

Subject: NUCLEAR PLANT NO. 2
USE OF PORTIONS OF LATER
ADDENDA OF ASME SECTION XI
EXAMINATION OF CLASS 2 SYSTEMS

The Supply System requests Nuclear Regulatory Commission approval to use paragraphs IWC1220, 1221 and 1222 and Table IWC2500, Category CF from the 1983 Edition, with Addenda through Winter 1983 (W83) of the ASME Boiler and Pressure Vessel Code, Section XI (attached). The requirements will be used for selection and examination of Class 2 piping (Category CF only) for the WNP-2 Inservice Inspection program. These requirements will be used in lieu of the mandatory requirements which according to 10CFR50.55a are ASME Section XI 1980 Edition, with Addenda through Winter 1980. For Emergency Core Cooling and Residual Heat Removal System, the mandatory Code is the 1974 Edition, with Addenda through Summer 1975.

The W-83 Addendum has not yet been referenced in 10CFR50.55a(b) as an approved Code. Therefore, specific approval is required to use the W-83 provisions.

The above paragraphs of Section XI (W-83) have been incorporated into a Code Case which is currently in the approval cycle. In February, this proposed Code Case passed ASME Subcommittee XI. However, we expect it to take another 6-12 months for it to be approved by the ASME Main Committee and be referenced in NRC Regulatory Guide 1.147. This schedule will not allow use of this Code Case by the Supply System for the WNP-2 Inservice Inspection Program.

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The W-83 Addendum differs from W-80 as follows:

- Selection criteria is based on more of a random sampling of a smaller percentage of welds in a larger number of systems and portions of systems.

- A volumetric and surface examination is required instead of a surface examination only.

It is expected that the NRC will approve the use of the applicable paragraphs of Section XI, 1983 Edition (annotated on the proposed Code Case - attached). The NRC representative on Subcommittee XI voted affirmation on this action on February 2, 1984.

Your prompt approval is requested to support the submittal of the WNP-2 Inservice Inspection Program, scheduled for March 31, 1984.

Very truly yours,

Mr. G. C. Sorensen, Manager
Regulatory Programs

TFH:shm

Attachment

cc: R. Auluck - NRC
M. Humm - NRC
W. Chin - BPA
A. Toth - NRC, Site

Class 2 Systems
1/31/84

Proposed Code Case

Alternative Rules for Examination of Class 2 Piping

Inquiry: When determining the components subject to examination and establishing examination requirements for Class 2 piping under Section XI Division 1, what alternative exemptions to those stated in IWC - 1220 and what alternative examination requirements to those stated in IWC -2500 Category CF, may be used?

Reply: It is the opinion of the committee that the following rules may be used for determining components subject to examination and establishing examination requirements for Class 2 piping under Section XI Division 1:

1. The following components (or parts of components) of RHR, ECC and CHR systems (or portions of systems)[1] are exempt from the volumetric and surface examination requirements of IWC-2500:

(IWC-1220)

(IWC-1221) (a) Vessels, piping, pumps, valves and other components NPS 4 and smaller in all systems except high pressure safety injection systems of pressurized water reactor plants.

(b) Vessels, piping, pumps, valves and other components NPS 1½ and smaller in high pressure safety injection systems of pressurized water reactor plants.

(c) Component connections NPS 4 and smaller (including nozzles, socket fittings, and other connections) in vessels, piping, pumps, valves and other components of any size in all systems except high pressure safety injection systems of pressurized water reactor plants.

(d) Component connections NPS 1½ and smaller (including nozzles, socket fittings, and other connections) in vessels, piping, pumps, valves and other components of any size in high pressure safety injection systems of pressurized water reactor plants.

1. RHR, ECC, and CHR Systems are the Residual Heat Removal, Emergency Core Cooling, and Containment Heat Removal Systems, respectively.

(e) Vessels, piping, pumps, valves, other components and component connections of any size in statically pressurized, passive (i.e., no pumps) safety injection systems[2] of pressurized water reactor plants.

(f) Piping and other components of any size beyond the last shutoff valve in open ended portions of systems that do not contain water during normal plant operating conditions.[3]

2. The following components (or parts of components) of systems (or portions of systems) other than RHR, ECC and CHR Systems are exempt from the volumetric and surface examination requirements of IWC-2500:

(IWC-1222)

(a) Vessels, piping, pumps, valves and other components NPS 4 and smaller.

(b) Component connections NPS 4 and smaller (including nozzles, socket fittings, and other connections) in vessels, piping, pumps, valves and other components of any size.

(c) Vessels, piping, pumps, valves, other components and component connections of any size in systems or portions of sytems that operate (when the system function is required) at pressure equal to or less than 275 psig and at a temperature equal to or less than 200°F.

(d) Piping and other components of any size beyond the last shutoff valve in open ended portions of systems that do not contain water during normal plant operating conditions.[3]

3. For welds in austenitic stainless steel or high alloy piping the requirements of attached Table 1 Examination Category CF-1 Pressure Retaining Welds in Austenitic Stainless Steel of High Alloy Piping shall be used as an alternative to the requirements of Table IWC-2500-1 Examination Category C-F, Pressure Retaining Welds in Piping.

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2. Statically pressurized, passive safety injection systems of pressurized water reactor plants are typically called by such names as:

- Accumulator tank and associated system
- Safety injection tank and associated system
- Core flooding tank and associated system

3. Normal plant operating conditions include reactor startup, operation at power, hot standby, and reactor cooldown to cold shutdown conditions, but do not include test conditions.

(e) Vessels, piping, pumps, valves, other components and component connections of any size in statically pressurized, passive (i.e., no pumps) safety injection systems[2] of pressurized water reactor plants.

(f) Piping and other components of any size beyond the last shutoff valve in open ended portions of systems that do not contain water during normal plant operating conditions.[3]

2. The following components (or parts of components) of systems (or portions of systems) other than RHR, ECC and CHR Systems are exempt from the volumetric and surface examination requirements of IWC-2500: (IWC-1222)

(a) Vessels, piping, pumps, valves and other components NPS 4 and smaller.

(b) Component connections NPS 4 and smaller (including nozzles, socket fittings, and other connections) in vessels, piping, pumps, valves and other components of any size.

(c) Vessels, piping, pumps, valves, other components and component connections of any size in systems or portions of sytems that operate (when the system function is required) at pressure equal to or less than 275 psig and at a temperature equal to or less than 200°F.

(d) Piping and other components of any size beyond the last shutoff valve in open ended portions of systems that do not contain water during normal plant operating conditions.[3]

3. For welds in austenitic stainless steel or high alloy piping the requirements of attached Table 1 Examination Category CF-1 Pressure Retaining Welds in Austenitic Stainless Steel of High Alloy Piping shall be used as an alternative to the requirements of Table IWC-2500-1 Examination Category C-F, Pressure Retaining Welds in Piping.

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2. Statically pressurized, passive safety injection systems of pressurized water reactor plants are typically called by such names as:

- Accumulator tank and associated system
- Safety injection tank and associated system
- Core flooding tank and associated system

3. Normal plant operating conditions include reactor startup, operation at power, hot standby, and reactor cooldown to cold shutdown conditions, but do not include test conditions.

4. For welds in carbon and low alloy steel piping. The requirements of attached Table 2, Examination Category CF-2, Pressure Retaining Welds in Carbon and Low Alloy Steel Piping shall be used as an alternative to the requirements of Table IWC-2500-1, Examination Category CF, Pressure Retaining Welds in Piping.

5. The examination requirements of Figures 1 and 2 shall apply to all surface and volumetric examinations including piping less than ½-in thick.

6. The examination requirements for pipe branch connections provided in Figures IWC-2500-9 through IWC-2500-13 of the 1983 Edition of Section XI shall apply to pipe branch connections NPS 2 and larger.

Applicability

This case is applicable to Section XI Editions beginning with the 1974 Edition and through the 1983 Addenda.

Application Justification

Inservice Inspection Requirements for Class 2 Systems were first included in the 1974 Edition. The provisions of this case will not be issued as part of the code until the Winter 1984 Addenda.

W83

TABLE 1

TABLE IWC-2500-1 (CONT'D)
EXAMINATION CATEGORIES

Table IWC-2500-1

EXAMINATION CATEGORY C-F-1, PRESSURE RETAINING WELDS IN AUSTENITIC STAINLESS STEEL OR HIGH ALLOY PIPING						
Item No.	Parts Examined[1]	Examination Requirements/ Fig. No.6	Examination Method	Acceptance Standard6	Extent of Examination[2]	Examination[5]
C5.10	Piping Welds ≥ 3/8 in. Nominal Wall Thickness for Piping > NPS 4					
C5.11	Circumferential Weld	IWC-2500-7	Surface and volumetric	IWC-3514	100% of each weld requiring examination	Each inspection interval
C5.12	Longitudinal Weld	IWC-2500-7	Surface and volumetric	IWC-3514	2.5t — at the intersecting circumferential weld	Each inspection interval
C5.20	Piping Welds > 1/5 in. Nominal Wall Thickness for Piping ≥ NPS 2 and < NPS 4					
C5.21	Circumferential Weld	IWC-2500-7	Surface and volumetric	IWC-3514	100% of each weld requiring examination	Each inspection interval
C5.22	Longitudinal Weld	IWC-2500-7	Surface and volumetric	IWC-3514	2.5t — at the intersecting circumferential weld	Each inspection interval
C5.30	Socket Welds	IWC-2500-7	Surface	IWC-3514	100% of each weld requiring examination	Each inspection interval
C5.40	Pipe Branch Connections of Branch Piping ≥ NPS 2					
C5.41	Circumferential Weld	IWC-2500-9 to -13, inclusive	Surface	IWC-3514	100% of each weld requiring examination	Each inspection interval
C5.42	Longitudinal Weld	IWC-2500-12 and -13	Surface	IWC-3514	2.5t — at the intersecting circumferential weld	Each inspection interval

NOTES:

(1) Requirements for examination of welds in piping ≤ NPS 4 apply to PWR high pressure safety injection systems in accordance with the exemption criteria of ~~IWC-1220~~ this case. this case

(2) The welds selected for examination shall include 7.5%, but not less than 28 welds, of all austenitic stainless steel or high alloy welds not exempted by ~~IWC-1220~~ this case. (Some welds not exempted by ~~IWC-1220~~ are not required to be nondestructively examined per Examination Category C-F-1. These welds, however, shall be included in the total weld count to which the 7.5% sampling rate is applied.) The examinations shall be distributed as follows:

(a) the examinations shall be distributed among the Class 2 systems prorated, to the degree practicable, on the number of nonexempt austenitic stainless steel or high alloy welds in each system (i.e., if a system contains 30% of the nonexempt welds, then 30% of the nondestructive examinations required by Examination Category C-F-1 should be performed on that system);

(b) within a system, the examinations shall be distributed among terminal ends [see Note (3)] and structural discontinuities [see Note (4)] prorated, to the degree practicable, on the number of nonexempt terminal ends and structural discontinuities in that system; and

(c) within each system, examinations shall be distributed between line sizes prorated to the degree practicable.

(3) Terminal ends are the extremities of piping runs that connect to structures, components (such as vessels, pumps, valves), or pipe anchors, each of which acts as a rigid restraint or provides at least two degrees of translational restraint to piping thermal expansion.

(4) Structural discontinuities include pipe weld joints to vessel nozzles, valve bodies, pump casings, pipe fittings (such as elbows, tees, reducers, flanges, etc., conforming to ANSI B16.9), and pipe branch connections and fittings.

(5) The welds selected for examination shall be reexamined during subsequent inspection intervals over the service lifetime of the piping component.

(6) Figure Numbers and acceptance standards refer to those in Section XI Winter 1983 Addenda

W83

TABLE 1

TABLE IWC-2500-1 (CONT'D)
EXAMINATION CATEGORIES

EXAMINATION CATEGORY C-F-1, PRESSURE RETAINING WELDS IN AUSTENITIC STAINLESS STEEL OR HIGH ALLOY PIPING						
Item No.	Parts Examined[1]	Examination Requirements/ Fig. No.[6]	Examination Method	Acceptance Standard[6]	Extent of Examination[2]	Examination[5]
C5.10	Piping Welds ≥ 3/8 in. Nominal Wall Thickness for Piping > NPS 4					
C5.11	Circumferential Weld	IWC-2500-7	Surface and volumetric	IWC-3514	100% of each weld requiring examination	Each inspection interval
C5.12	Longitudinal Weld	IWC-2500-7	Surface and volumetric	IWC-3514	2.5*t* — at the intersecting circumferential weld	Each inspection interval
C5.20	Piping Welds > 1/5 in. Nominal Wall Thickness for Piping ≥ NPS 2 and < NPS 4					
C5.21	Circumferential Weld	IWC-2500-7	Surface and volumetric	IWC-3514	100% of each weld requiring examination	Each inspection interval
C5.22	Longitudinal Weld	IWC-2500-7	Surface and volumetric	IWC-3514	2.5*t* — at the intersecting circumferential weld	Each inspection interval
C5.30	Socket Welds	IWC-2500-7	Surface	IWC-3514	100% of each weld requiring examination	Each inspection interval
C5.40	Pipe Branch Connections of Branch Piping ≥ NPS 2					
C5.41	Circumferential Weld	IWC-2500-9 to -13, inclusive	Surface	IWC-3514	100% of each weld requiring examination	Each inspection interval
C5.42	Longitudinal Weld	IWC-2500-12 and -13	Surface	IWC-3514	2.5*t* — at the intersecting circumferential weld	Each inspection interval

NOTES:

(1) Requirements for examination of welds in piping ≤ NPS 4 apply to PWR high pressure safety injection systems in accordance with the exemption criteria of IWC-1220 this case.

(2) The welds selected for examination shall include 7.5%, but not less than 28 welds, of all austenitic stainless steel or high alloy welds not exempted by IWC-1220 this case. (Some welds not exempted by IWC-1220 this case are not required to be nondestructively examined per Examination Category C-F-1. These welds, however, shall be included in the total weld count to which the 7.5% sampling rate is applied.) The examinations shall be distributed as follows:

(a) the examinations shall be distributed among the Class 2 systems prorated, to the degree practicable, on the number of nonexempt austenitic stainless steel or high alloy welds in each system (i.e., if a system contains 30% of the nonexempt welds, then 30% of the nondestructive examinations required by Examination Category C-F-1 should be performed on that system);

(b) within a system, the examinations shall be distributed among terminal ends [see Note (3)] and structural discontinuities [see Note (4)] prorated, to the degree practicable, on the number of nonexempt terminal ends and structural discontinuities in that system; and

(c) within each system, examinations shall be distributed between line sizes prorated to the degree practicable.

(3) Terminal ends are the extremities of piping runs that connect to structures, components (such as vessels, pumps, valves), or pipe anchors, each of which acts as a rigid restraint or provides at least two degrees of translational restraint to piping thermal expansion.

(4) Structural discontinuities include pipe weld joints to vessel nozzles, valve bodies, pump casings, pipe fittings (such as elbows, tees, reducers, flanges, etc., conforming to ANSI B16.9), and pipe branch connections and fittings.

(5) The welds selected for examination shall be reexamined during subsequent inspection intervals over the service lifetime of the piping component.

(6) Figure Numbers and acceptance standards refer to those in Section XI Winter 1983 Addenda

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Table 2

TABLE IWC-2500-1 (CONT'D)
EXAMINATION CATEGORIES

EXAMINATION CATEGORY C-F-2, PRESSURE RETAINING WELDS IN CARBON ~~AND~~ OR LOW ALLOY STEEL PIPING						
Item No.	Parts Examined[1]	Examination Requirements/ Fig. No. 7	Examination Method	Acceptance Standard 7	Extent of Examination[2,6]	Frequency of Examination[5]
C5.50	Piping Welds ≥ 3/8 in. Nominal Wall Thickness for Piping > NPS 4					
C5.51	Circumferential Weld	IWC-2500-7	Surface and volumetric	IWC-3514	100% of each weld requiring examination	Each inspection interval
C5.52	Longitudinal Weld	IWC-2500-7	Surface and volumetric	IWC-3514	2.5*t* — at the intersecting circumferential weld	Each inspection interval
C5.60	Piping Welds > 1/5 in. Nominal Wall Thickness for Piping ≥ NPS 2 and < NPS 4					
C5.61	Circumferential Weld	IWC-2500-7	Surface and volumetric	IWC-3514	100% of each weld requiring examination	Each inspection interval
C5.62	Longitudinal Weld	IWC-2500-7	Surface and volumetric	IWC-3514	2.5*t* — at the intersecting circumferential weld	Each inspection interval
C5.70	Socket Welds	IWC-2500-7	Surface	IWC-3514	100% of each weld requiring examination	Each inspection interval
C5.80	Pipe Branch Connections of Branch Piping ≥ NPS 2					
C5.81	Circumferential Weld	IWC-2500-9 to -13, inclusive	Surface	IWC-3514	100% of each weld requiring examination	Each inspection interval
C5.82	Longitudinal Weld	IWC-2500-12 and -13	Surface	IWC-3514	2.5*t* — at the intersecting circumferential weld	Each inspection interval

NOTES:

(1) Requirements for examination of welds in piping ≤ NPS 4 apply to PWR high pressure safety injection systems in accordance with the exemption criteria of IWC-1220 this case.

(2) The welds selected for examination shall include 7.5%, but not less than 28 welds, of all ~~austenitic stainless steel~~ Carbon or ~~high~~ Low alloy welds not exempted by IWC-1220 this case. (Some welds not exempted by IWC-1220 this case are not required to be nondestructively examined per Examination Category C-F-2. These welds, however, shall be included in the total weld count to which the 7.5% sampling rate is applied.) The examinations shall be distributed as follows:

(a) the examinations shall be distributed among the Class 2 systems prorated, to the degree practicable, on the number of nonexempt ~~austenitic stainless~~ Carbon steel or ~~high~~ Low alloy welds in each system (i.e., if a system contains 30% of the nonexempt welds, then 30% of the nondestructive examinations required by Examination Category C-F-2 should be performed on that system);

(b) within a system, the examinations shall be distributed among terminal ends [see Note (3)] and structural discontinuities [see Note (4)] prorated, to the degree practicable, on the number of nonexempt terminal ends and structural discontinuities in that system; and

(c) within each system, examinations shall be distributed between line sizes prorated to the degree practicable.

(3) Terminal ends are the extremities of piping runs that connect to structures, components (such as vessels, pumps, valves), or pipe anchors, each of which acts as a rigid restraint or provides at least two degrees of translational restraint to piping thermal expansion.

(4) Structural discontinuities include pipe weld joints to vessel nozzles, valve bodies, pump casings, pipe fittings (such as elbows, tees, reducers, flanges, etc., conforming to ANSI B16.9), and pipe branch connections and fittings.

(5) The welds selected for examination shall be reexamined during subsequent inspection intervals over the service lifetime of the piping component.

(6) For welds in carbon steels, only those welds showing reportable preservice transverse indications need to be examined for transverse reflections.

7. Figure numbers and acceptance standards refer to those in Section XI Winter 1983 Addenda

128.1

1983 Edition

REQUIREMENTS FOR CLASS 2 COMPONENTS

Table IWC-2500-1

W83

Table 2

TABLE IWC-2500-1 (CONT'D)
EXAMINATION CATEGORIES

EXAMINATION CATEGORY C-F-2, PRESSURE RETAINING WELDS IN CARBON ~~AND~~ or LOW ALLOY STEEL PIPING						
Item No.	Parts Examined[1]	Examination Requirements/ Fig. No. 7	Examination Method	Acceptance Standard 7	Extent of Examination[2,6]	Frequency of Examination[5]
C5.50	Piping Welds ≥ 3/8 in. Nominal Wall Thickness for Piping > NPS 4					
C5.51	Circumferential Weld	IWC-2500-7	Surface and volumetric	IWC-3514	100% of each weld requiring examination	Each inspection interval
C5.52	Longitudinal Weld	IWC-2500-7	Surface and volumetric	IWC-3514	2.5*t* — at the intersecting circumferential weld	Each inspection interval
C5.60	Piping Welds > 1/5 in. Nominal Wall Thickness for Piping ≥ NPS 2 and < NPS 4					
C5.61	Circumferential Weld	IWC-2500-7	Surface and volumetric	IWC-3514	100% of each weld requiring examination	Each inspection interval
C5.62	Longitudinal Weld	IWC-2500-7	Surface and volumetric	IWC-3514	2.5*t* — at the intersecting circumferential weld	Each inspection interval
C5.70	Socket Welds	IWC-2500-7	Surface	IWC-3514	100% of each weld requiring examination	Each inspection interval
C5.80	Pipe Branch Connections of Branch Piping ≥ NPS 2					
C5.81	Circumferential Weld	IWC-2500-9 to -13, inclusive	Surface	IWC-3514	100% of each weld requiring examination	Each inspection interval
C5.82	Longitudinal Weld	IWC-2500-12 and -13	Surface	IWC-3514	2.5*t* — at the intersecting circumferential weld	Each inspection interval

NOTES:

(1) Requirements for examination of welds in piping ≤ NPS 4 apply to PWR high pressure safety injection systems in accordance with the exemption criteria of IWC-1220 this case.

(2) The welds selected for examination shall include 7.5%, but not less than 28 welds, of all ~~austenitic stainless steel~~ Carbon or ~~high~~ Low alloy welds not exempted by IWC-1220 this case. (Some welds not exempted by IWC-1220 this case are not required to be nondestructively examined per Examination Category C-F-2. These welds, however, shall be included in the total weld count to which the 7.5% sampling rate is applied.) The examinations shall be distributed as follows:

(a) the examinations shall be distributed among the Class 2 systems prorated, to the degree practicable, on the number of nonexempt ~~austenitic stainless steel~~ carbon or ~~high~~ low alloy welds in each system (i.e., if a system contains 30% of the nonexempt welds, then 30% of the nondestructive examinations required by Examination Category C-F-2 should be performed on that system);

(b) within a system, the examinations shall be distributed among terminal ends [see Note (3)] and structural discontinuities [see Note (4)] prorated, to the degree practicable, on the number of nonexempt terminal ends and structural discontinuities in that system; and

(c) within each system, examinations shall be distributed between line sizes prorated to the degree practicable.

(3) Terminal ends are the extremities of piping runs that connect to structures, components (such as vessels, pumps, valves), or pipe anchors, each of which acts as a rigid restraint or provides at least two degrees of translational restraint to piping thermal expansion.

(4) Structural discontinuities include pipe weld joints to vessel nozzles, valve bodies, pump casings, pipe fittings (such as elbows, tees, reducers, flanges, etc., conforming to ANSI B16.9), and pipe branch connections and fittings.

(5) The welds selected for examination shall be reexamined during subsequent inspection intervals over the service lifetime of the piping component.

(6) For welds in carbon steels, only those welds showing reportable preservice transverse indications need to be examined for transverse reflectors.

7. Figure numbers and acceptance standards refer to those in Section XI Winter 1983 Addenda

1983 Edition

REQUIREMENTS FOR CLASS 2 COMPONENTS

Table IWC-2500-1

128.1