

PMNorthAnna3COLPEmails Resource

From: Jerry Hale
Sent: Wednesday, August 13, 2008 11:45 AM
To: NorthAnna3COL Resource
Subject: FW: Response to Request for Additional Information Letter No. 014
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Importance: High

From: Wanda.K.Marshall@dom.com [mailto:Wanda.K.Marshall@dom.com]
Sent: Wednesday, August 13, 2008 10:46 AM
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Subject: Response to Request for Additional Information Letter No. 014
Importance: High

cc list:

Please see attached.

Wanda K. Marshall
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August 12, 2008

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

Serial No. NA3-08-067R
Docket No. 52-017
COL/GY

DOMINION VIRGINIA POWER
NORTH ANNA UNIT 3 COMBINED LICENSE APPLICATION
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION LETTER 014

On June 27, 2008, the NRC requested additional information to support the review of certain portions of the North Anna Unit 3 Combined License Application (COLA). The letter contained nine RAIs. The responses to the following eight RAIs are provided in Enclosures 1 through 8:

- RAI Question 03.07.01-1 Ground Motion Time Histories
- RAI Question 05.02.04-1 Preservice Inspection (PSI) of 100% of Welds
- RAI Question 05.02.04-2 PSI Compliance with NB-5280
- RAI Question 05.02.04-3 PSI Exams Equivalent to Inservice Inspection (ISI) Exams
- RAI Question 05.02.04-4 Incorporating Limits of 10CFR50.55a(b)(2)
- RAI Question 05.02.04-5 Limited Use of Provisions of IWA-2240
- RAI Question 05.02.04-6 ISI/PSI Programs for Component Supports
- RAI Question 05.02.04-7 Qualification of Ultrasonic Examination Procedures

This information will be incorporated into a future submission of the North Anna Unit 3 COLA, as described in the enclosures.

The response to the ninth RAI, Question 03.07.02-1, "Structural Interactions Due to Seismic Failures," will be provided separately.

Please contact Regina Borsh at (804) 273-2247 (regina.borsh@dom.com) if you have questions.

Very truly yours,

Eugene S. Grecheck

COMMONWEALTH OF VIRGINIA

COUNTY OF HENRICO

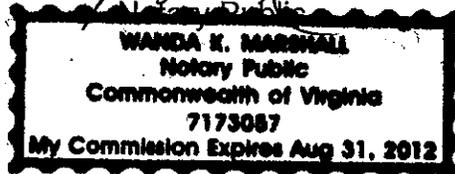
The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Eugene S. Grecheck, who is Vice President-Nuclear Development of Virginia Electric and Power Company (Dominion Virginia Power). He has affirmed before me that he is duly authorized to execute and file the foregoing document on behalf of the Company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 12th day of August, 2008

My registration number is 7173057 and my

Commission expires: August 31, 2012





Enclosures:

1. Response to RAI Letter 014, RAI Question 03.07.01-1
2. Response to RAI Letter 014, RAI Question 05.02.04-1
3. Response to RAI Letter 014, RAI Question 05.02.04-2
4. Response to RAI Letter 014, RAI Question 05.02.04-3
5. Response to RAI Letter 014, RAI Question 05.02.04-4
6. Response to RAI Letter 014, RAI Question 05.02.04-5
7. Response to RAI Letter 014, RAI Question 05.02.04-6
8. Response to RAI Letter 014, RAI Question 05.02.04-7

Commitments made by this letter:

1. Incorporate proposed changes in a future COLA submission.

cc: U. S. Nuclear Regulatory Commission, Region II
T. A. Kevern, NRC
J. T. Reece, NRC
J. J. Debiec, ODEC
G. A. Zinke, NuStart/Entergy
T. L. Williamson, Entergy
R. Kingston, GEH
K. Ainger, Exelon
P. W. Smith, DTE Energy

ENCLOSURE 1

Response to NRC RAI Letter 014

RAI Question 03.07.01-1

NRC RAI 03.07.01-1

FSAR Section 3.7.1.1, Design Ground Motion, NAPS SUP 3.7-2, Site-Specific Design Ground Motion Time History, states that the site-specific earthquake ground motion time history is described in Section 2.5.4. However, staff review indicates such information is not included in Section 2.5.4. Please identify the appropriate FSAR Sections and Figures that address ground motion time histories.

Dominion Response

As indicated in FSAR Section 2.5.4.7.3, site-specific ground motion time histories for the North Anna Unit 3 site are described in Section 2.5.4.7.3 of the Site Safety Analysis Report (SSAR) for the North Anna Early Site Permit Application, which is incorporated by reference into the Combined License Application FSAR.

Specifically, SSAR Section 2.5.4.7.3 states:

Two single horizontal-component acceleration time histories were developed to be spectrum-compatible for use in the rock column amplification analysis of [SSAR] Section 2.5.2.6.7 and the soil column amplification analysis described in [SSAR] Section 2.5.4.7.4. These time histories represent the high frequency and low frequency range of the horizontal hard rock SSE spectrum of [SSAR] Figure 2.5-48. These two time histories are described in [SSAR] Section 2.5.2.6.7.

The introductory paragraph for SSAR Section 2.5.2.6.7 states:

[SSAR] Figure 2.5-48 shows the hard rock (9,200 fps control point) horizontal and vertical SSE ground motion spectra selected for the North Anna ESP site. These spectra were established in consideration of two alternate approaches described in this section: a reference probability approach and a performance-based approach. The SSE spectra shown in Figure 2.5-48 have been conservatively selected to envelop both approaches.

The balance of SSAR Section 2.5.2.6.7 then proceeds to discuss the development of the subject SSE spectra.

Proposed COLA Revision

None

ENCLOSURE 2

Response to NRC RAI Letter 014

RAI Question 05.02.04-1

NRC RAI 05.02.04-1

FSAR Section 5.2 incorporates by reference Section 5.2 of the ESBWR DCD, Revision 4, with standard COL Item STD COL 5.2-1-H and Supplement STD SUP 5.2-1. DCD Section 5.2.4.3.1, in describing the preservice inspection (PSI) program, states all items selected for inservice inspection (ISI) shall be performed once for PSI in accordance with IWB-2200. The staff notes that Section XI typically requires approximately 25% sampling of the Class 1 piping welds to be selected for ISI. In addition, IWB-2200 states preservice examinations are to be extended to include essentially 100% of the pressure retaining welds in all Class 1 components, except in those components exempted from examination by IWB-1220(a), (b), or (c). Please verify compliance with 10 CFR 50.55a(g) and Section XI by describing provisions to satisfy ASME Code, Section XI, Subsection IWB-2200, to extend the preservice examinations to include essentially 100% of the pressure retaining welds in all Class 1 components, except those components exempt from examination by IWB-1220.

Dominion Response

In DCD, Revision 5, the second paragraph of Section 5.2.4.3.1 was revised to state:

The preservice examination is performed once in accordance with ASME Section XI, IWB-2200, with the exception of examinations specifically excluded by ASME Section III NB-5283 and Section XI from preservice requirements, such as VT-3 examination of valve body and pump casing internal surfaces (B-L-2 and B-M-2 examinations categories, respectively) and the visual VT-2 examinations for category B-P.

This DCD change will extend the preservice examinations to include essentially 100% of the pressure retaining welds in all Class 1 components, except those components exempt from examination by IWB-1220.

Proposed COLA Revision

None

ENCLOSURE 3

Response to NRC RAI Letter 014

RAI Question 05.02.04-2

NRC RAI 05.02.04-2

FSAR Section 5.2.4, Preservice and Inservice Inspection and Testing of Reactor Coolant Pressure Boundary, incorporates by reference the ESBWR DCD as supplemented with STD COL 5.2-1-H. SRP 5.2.4 and RG 1.206 identify the need for Preservice Inspection programs to comply with Subsubarticle NB-5280 of Section III, Division 1, of the ASME Code. Staff review identified that neither FSAR Section 5.2.4 nor DCD Section 5.2.4 address the PSI program compliance with NB-5280. Please revise FSAR Section 5.2.4 to describe how the PSI program complies with NB-5280.

Dominion Response

In DCD, Revision 5, Section 5.2.4.9 was revised to state:

Preservice examinations required by design specification and preservice documentation are in accordance with ASME Section III, NB-5281. Examination requirements are in accordance with Section III NB-5282 and Section XI, Table IWB-2500-1. Components exempt from preservice examination are described in ASME Section III, NB-5283.

Subsubarticle NB-5280 of Section III, Division 1, of the ASME Code is the title ('Preservice Inspection') of the section containing paragraphs NB-5281, NB-5282 and NB-5283. Therefore, this DCD change incorporates PSI program compliance with NB-5280.

Proposed COLA Revision

None

ENCLOSURE 4

Response to NRC RAI Letter 014

RAI Question 05.02.04-3

NRC RAI 05.02.04-3

FSAR Section 5.2.4, Preservice and Inservice Inspection and Testing of Reactor Coolant Pressure Boundary, incorporates by reference the ESBWR DCD with supplement STD COL 5.2-1-H. Staff review identified that neither FSAR Section 5.2.4 nor the DCD address conformance with ASME Section XI IWA-2200(b)(2) for PSI exams to be conducted under conditions and with equipment and techniques equivalent to those expected to be employed for subsequent inservice examinations. Please revise FSAR Section 5.2.4 to describe how the ISI/PSI programs will meet IWB-2200(b)(2) for PSI exams to be conducted under conditions and with equipment and techniques equivalent to those expected to be employed for subsequent inservice examinations. The staff notes that if PSI exams do not utilize the same examination techniques as those employed for subsequent inservice examinations, the usefulness of PSI data may be limited when compared to ISI data.

Dominion Response

DCD Section 5.2.4 states that all items within the Class 1 boundary are designed to provide access for the examinations required by ASME Section XI, IWB-2500. Statements were added to the DCD in Revision 5 to address accessibility to welds and the selection of examination techniques for ISI and PSI examinations. The applicable text in the second paragraph of DCD, Section 5.2.4.2, was revised in DCD Revision 5, to state:

The process that is being used by GEH in the certified design of the ESBWR is to require specific access requirements to support the preferred UT or optional RT examination in the equipment procurement specifications that are in compliance with the ASME Section XI Code. The selection of which NDE method, UT or RT, that will be used to fulfill preservice inspection and in-service inspection examination requirements will take into full consideration the operational and radiological concerns associated with the method selected. Additionally, the design procedural requirements for the 3D layout of the plant include acceptance criteria regarding access for inspection equipment and personnel. Through these procedural requirements, no deviations in providing the required access are expected.

Additionally, DCD, Revision 5, added the following COL item to Section 5.2.6:

5.2-3-A Preservice and In-service Inspection NDE Accessibility Plan Description

The COL Applicant is responsible for developing a plan and providing a full description of its use during construction, preservice inspection, in-service inspection, and during design activities for components that are not included in the referenced certified design, to preserve accessibility to piping systems to enable NDE of ASME Code Class 1 austenitic and DM welds during inservice inspection (Subsection 5.2.4).

In response to this new COL item, Section 5.2.4.2 of the FSAR will be revised to describe the controls that will be used to ensure accessibility to piping systems as stated in the COL item. These controls include the use of change control procedures. The FSAR will also be revised to state that if a different NDE method is used for ISI than was used for PSI, equivalent coverage will be achieved as required by code.

These revisions to the DCD and the FSAR provide the information requested in this RAI.

Proposed COLA Revision

In response to the new COL Item 5.2-3-A:

- 1) FSAR Section 5.2.4 will be revised to clarify that all Class 1 austenitic or dissimilar metal welds are included in the referenced certified design.
- 2) FSAR Section 5.2.4.2 will be revised to address the following for Class 1 components:
 - Modifications and field changes to approved design documents require the same level of review and approval as the original design.
 - Accessibility and inspectability are key components of the design process.
 - Control of accessibility for inspectability and testing during post-design certification activities is provided via procedures for design control and plant modifications.
 - Ultrasonic techniques (UT) will be the preferred NDE method for all PSI and ISI volumetric examinations; radiographic techniques (RT) will be used as a last resort only if UT cannot achieve the necessary coverage.
 - The same NDE method used during PSI will be used for ISI to the extent possible to assure a baseline point of reference remains relevant. If a different NDE method is used for ISI than was used for PSI, equivalent coverage will be achieved as required by code.

Please refer to the attached markups.

Markup of North Anna COLA

The attached markup represents Dominion's good faith effort to show how the COLA will be revised in a future COLA submittal in response to the subject RAI. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be somewhat different than as presented herein.

Chapter 5 Reactor Coolant System and Connected Systems

5.1 Summary Description

This section of the referenced DCD is incorporated by reference with no departures or supplements.

5.2 Integrity of Reactor Coolant Pressure Boundary

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

5.2.4 Preservice and Inservice Inspection and Testing of Reactor Coolant Pressure Boundary

STD COL 5.2-3-A Replace the second sentence in the second paragraph with the following.

All Class 1 austenitic or dissimilar metal welds are included in the referenced certified design.

Replace the last two sentences in the third paragraph with the following.

STD COL 5.2-1-H The initial inservice inspection program incorporates the latest edition and addenda of the ASME Boiler and Pressure Vessel Code approved in 10 CFR 50.55a(b) on the date 12 months before initial fuel load.

5.2.4.2 Accessibility

Replace the last sentence in the second paragraph with the following.

STD COL 5.2-3-A During the construction phase of the project, anomalies and construction issues are addressed using change control procedures. Procedures require that changes to approved design documents, including field changes and modifications, are subject to the same review and approval process as the original design. Accessibility and inspectability are key components of the design process. Control of accessibility for inspectability and testing during licensee design activities affecting Class I components is provided via procedures for design control and plant modifications.

Ultrasonic techniques (UT) will be the preferred NDE method for all PSI and ISI volumetric examinations; radiographic techniques (RT) will be used as a last resort only if UT cannot achieve the necessary coverage. The same NDE method used during PSI will be used for ISI to the extent possible to assure a baseline point of reference. If a different NDE

method is used for ISI than was used for PSI, equivalent coverage will be achieved as required by code.

5.2.4.6 **System Leakage and Hydrostatic Pressure Tests**

Add the following paragraph at the end of this section.

STD SUP 5.2-1

System pressure tests and correlated technical specification requirements are provided in the plant Technical Specifications 3.4.4, "RCS Pressure and Temperature (P/T) Limits," and 3.10.1, "Inservice Leak and Hydrostatic Testing Operation."

5.2.4.11 **COL Information for Preservice and Inservice Inspection and Testing Program of Reactor Coolant Pressure Boundary**

Replace the first sentence of the first paragraph of this section with the following.

STD COL 5.2-1-H

DCD Section 5.2.4 fully describes the Preservice and Inservice Inspection and Testing Programs for the RCPB. The implementation milestones for the Preservice and Inservice Inspection and Testing Programs are provided in Section 13.4.

Replace DCD Section 5.2.5.9 with the following.

STD COL 5.2-2-H

5.2.5.9 **Leak Detection Monitoring**

Operators are provided with procedures for detecting, monitoring, recording, trending, and determining the sources of reactor coolant pressure boundary leakage. Examples of parameters that are monitored are sump pump run time, sump level, condensate transfer rate, and process chemistry/radioactivity.

The procedures are used for converting different parameter indications for identified and unidentified leakage into common leak rate equivalents (volumetric or mass flow) and leak rate rate-of-change values, including indications from: 1) the drywell floor drain high conductivity water sump monitoring system, 2) the drywell air coolers condensate flow monitoring system, and 3) the drywell fission product monitoring system.

The procedures are used to monitor leakage at levels well below Technical Specifications limits and provide guidance for evaluating

ENCLOSURE 5

Response to NRC RAI Letter 014

RAI Question 05.02.04-4

NRC RAI 05.02.04-4

FSAR Section 5.2.4 incorporates by reference ESBWR DCD Section 5.2.4 with standard COL item STD COL 5.2-1-H. The DCD was developed to meet the requirements of the 2001 Edition through 2003 Addenda of the ASME Code, Section XI. The staff notes that 10 CFR 50.55a(b)(2) imposes certain limitations/modifications on the use of this code and that the DCD does not address all of these limitations/modifications. Limitations not addressed in the DCD include the areas of Class 1 piping exemptions, Appendix VIII implementation, certification of NDE personnel, surface examinations, and pressure testing of mechanical joints. Please revise FSAR Section 5.2.4 to demonstrate that the limitations/modifications of 10 CFR 50.55a(b)(2) have been incorporated into the PSI/ISI programs.

Dominion Response

DCD Section 5.2.4, "Preservice and In-service Inspection and Testing of Reactor Coolant Pressure Boundary," describes the preservice and in-service inspection and system pressure test programs for NRC Quality Group A, ASME B&PV Code, Class 1 items. DCD Sections 5.2.4 and 5.2.4.10 state that "10 CFR 50.55a prescribes Section XI Editions and Addenda applicable to In-service inspection programs, subject to limitations and modifications found therein." DCD Sections 5.2.4 and 5.2.4.10 are incorporated by reference into the FSAR. Implementation of this statement requires Dominion to address and incorporate into the preservice and in-service inspection programs the limitations/modifications in 10 CFR 50.55a(b)(2) that are applicable to the ASME Code edition and addenda incorporated into the preservice/in-service inspection programs.

Also, DCD, Revision 5, included the following revisions to sections of the in-service inspection program description regarding the applicability of the limitations addressed in 10 CFR 50.55a(b)(2):

(A) Class 1 Piping Exemptions

DCD, Revision 5, Section 5.2.4.1 and Section 5.2.4.7 were revised to address the limitation in 10 CFR 50.55a(b)(2)(xi) which excludes the use of paragraph IWB-1220(d). The last paragraph of DCD Section 5.2.4.1 was revised to state:

The Class 1 components exempt from in-service examinations are described in ASME Code Section XI, IWB-1220, with the limitation of 10 CFR 50.55a(b)(2)(xi) which restricts the use of ASME Section XI to the 1989 Edition. This limitation excludes the use of paragraph IWB-1220(d). If any Class 1 welds are inaccessible due to being encased in concrete, buried underground, located inside a penetration, or encapsulated by a guard pipe, they are still considered to be within the scope of ASME Section XI and are subject to examination requirements.

DCD Section 5.2.4.7 was revised to state:

As provided in ASME Section XI, IWB-1220, certain portions of Class 1 systems are exempt from the volumetric and surface examination requirements of IWB-2500. Components exempt from preservice inspection and in-service inspection requirements are identified in the in-service inspection program. However, 10 CFR 50.55a(b)(2)(xi) eliminates the use of IWB-1220(d) by requiring the use of the 1989 Edition of Section XI. If any Class 1 welds are inaccessible due to being encased in concrete, buried underground, located inside a penetration, or encapsulated by a guard pipe, they are still considered to be within the scope of ASME Section XI and are subject to examination requirements.

(B) Appendix VIII Implementation

DCD, Revision 5, Section 5.2.4.3.4 was revised to address the qualification of ultrasonic examination procedures. The revised section states:

Personnel performing ultrasonic examinations shall be qualified in accordance with ASME Section XI, Appendix VII. Ultrasonic examination systems (personnel, procedures, and equipment) shall be qualified in accordance with industry accepted programs for implementation of ASME Section XI, Appendix VIII, as modified by 10 CFR 50.55a(b)(2)(xiv), (xv), (xvi) and (xxiv).

(C) Surface Examinations

DCD, Revision 5, added text to Section 5.2.4.3.2 to address limitations described in 10 CFR 50.55a(b)(2)(xxii):

Even though ASME Section XI allows UT examination to be used as a surface examination method, 10 CFR 50.55a(b)(2)(xxii) prohibits its use.

In addition to the DCD revisions identified above, the following FSAR changes will be made to the in-service inspection program description regarding the applicability of the limitations addressed in 10 CFR 50.55a(b)(2):

(A) Certification of NDE Personnel

DCD, Revision 5, specifically addresses compliance with ASME Section XI, Appendix VIII, regarding personnel qualifications in Section 5.2.4.3.4 as noted above, including the limitations imposed by 10 CFR 50.55a(b)(2) on its use. However, certification of NDE personnel is not specifically discussed in the DCD, nor is the associated limitation of 10 CFR

50.55a(b)(2)(xviii) discussed. Therefore, to address the 10 CFR 50.55a(b)(2) limitation regarding certification of NDE personnel, FSAR Section 5.2.4.3.4 will be revised to require that the qualification and certification of NDE personnel shall be in accordance with ASME Section XI, IWA-2300 as modified by 10 CFR 50.55a(b)(2)(xviii).

(B) Pressure Testing of Mechanical Joints:

The limitation of 10 CFR 50.55a(b)(2)(xxvi) requires a post-installation system leakage test at normal operating pressure and temperature, which is the standard ASME Section XI pressure test described in DCD, Revision 5, Section 5.2.4.6 for Class 1 systems, and in DCD, Revision 5, Section 6.6.6 for Class 2 and 3 systems. This testing includes pressure testing of mechanical joints. However, additional information will be added to FSAR Section 6.6.6 to address this limitation.

Proposed COLA Revision

FSAR Section 5.2.4 and FSAR Section 6.6.6 will be revised as indicated in the attached markup.

Markup of North Anna COLA

The attached markup represents Dominion's good faith effort to show how the COLA will be revised in a future COLA submittal in response to the subject RAI. However, the same COLA content may be impacted by revisions to the ESBWR DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be somewhat different than as presented herein.

method is used for ISI than was used for PSI, equivalent coverage will be achieved as required by code.

5.2.4.3.4 **Qualification of Personnel and Examination Systems for Ultrasonic Examination**

Add the following at the end of the paragraph.

STD COL 5.2-1H

Certification of NDE personnel shall be in accordance with ASME Section XI, IWA-2300, as modified by 10 CFR 50.55a(b)(92)9xviii).

5.2.4.6 **System Leakage and Hydrostatic Pressure Tests**

Revise the second sentence of the first paragraph as follows.

STD COL 5.2-1H

Regardless of which test method is chosen, system leakage and hydrostatic pressure tests will meet all requirements of ASME Code Section XI, IWA-5000 and IWB-5000 for Class I components, including the limitation of 10 CFR 50.55a(b)(2)(xxvi).

Add the following paragraph at the end of this section.

STD SUP 5.2-1

System pressure tests and correlated technical specification requirements are provided in the plant Technical Specifications 3.4.4, "RCS Pressure and Temperature (P/T) Limits," and 3.10.1, "Inservice Leak and Hydrostatic Testing Operation."

5.2.4.11 **COL Information for Preservice and Inservice Inspection and Testing Program of Reactor Coolant Pressure Boundary**

Replace the first sentence of the first paragraph of this section with the following.

STD COL 5.2-1-H

DCD Section 5.2.4 fully describes the Preservice and Inservice Inspection and Testing Programs for the RCPB. The implementation milestones for the Preservice and Inservice Inspection and Testing Programs are provided in Section 13.4.

6.5 Atmosphere Cleanup Systems

This section of the referenced DCD is incorporated by reference with no departures or supplements.

6.6 Preservice and Inservice Inspection and Testing of Class 2 and 3 Components and Piping

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

STD COL 6.6-2-A Delete the second sentence in the third paragraph.

Replace the last three sentences and the parenthetical statement of the fourth paragraph with the following.

STD COL 6.6-1-A The PSI/ISI program description for Class 2 and 3 components and piping is provided in DCD Section 6.6.

6.6.2 Accessibility

Replace the last sentence in the second paragraph with the following.

STD COL 6.6-2-A All Class 2 or 3 austenitic or dissimilar metal welds are included in the referenced certified design.

During the construction phase of the project, anomalies and construction issues are addressed using change control procedures. Procedures require that changes to approved design documents, including field changes and modifications, are subject to the same review and approval process as the original design.

Accessibility and inspectability are key components of the design process. Control of accessibility for inspectability and testing during licensee design activities affecting Class 2 and 3 components is provided via procedures for design control and plant modifications.

6.6.6 System Pressure Tests

Revise the second sentence of the first paragraph as follows.

STD COL 5.2-1H Regardless of which test method is chosen, system leakage and hydrostatic pressure tests will meet all applicable requirements of ASME Code Section XI, IWA-5000 and IWC-5000 for Class 2 components; and

IWD-5000 for Class 3 components, including the limitations of
10 CFR 50.55a(b)(2)(xx) and 10 CFR 50.55a(b)(2)(xxvi).

6.6.7 Augmented Inservice Inspections

STD COL 6.6-1-A

6.6.7.1 Flow Accelerated Corrosion Program Description

The flow accelerated corrosion (FAC) monitoring program analyzes, inspects, monitors, and trends nuclear power plant piping and components that are susceptible to FAC damage. The FAC program is based on EPRI NSAC-202L (Reference 6.6-201).

Prior to start-up, a comprehensive FAC-susceptibility screening will be performed to identify any plant systems that may be susceptible to FAC degradation. Should any plant systems remain susceptible, a FAC program will be implemented as described below. Program implementation milestones are provided in Section 13.4. Pre-service baseline nondestructive examination (NDE) inspections will be performed and material constituency identified for each as-fabricated piping component in the susceptible systems.

6.6.7.1.1 Analysis

A program similar to that described in EPRI NSAC-202L is used to identify the most susceptible components and to evaluate the rate of wall thinning for components and piping potentially susceptible to FAC. Each susceptible component is tracked in a database and is inspected, based on susceptibility. For each piping component, the program predicts the wear, and the estimated time until it must be re-inspected, repaired, or replaced.

6.6.7.1.2 Industry Experience

Industry experience provides a valuable supplement to plant analysis and associated inspections. Reviews of industry experience are performed to identify generic plant problem areas and determine differences in similar types of components. This information is used to update the FAC program.

6.6.7.1.3 Inspections

Wall thickness measurements establish the extent of wear in a given component, provide data to help evaluate trends, and provide data to refine the predictive model. Components are inspected for wear using ultrasonic techniques (UT), radiography techniques (RT), or by visual

ENCLOSURE 6

Response to NRC RAI Letter 014

RAI Question 05.02.04-5

NRC RAI 05.02.04-5

FSAR Section 5.2.4 incorporates by reference Section 5.2.4 of the ESBWR DCD with standard COL Item STD COL 5.2-1-H. The DCD was developed to meet the requirements of the 2001 Edition through 2003 Addenda of the ASME Code, Section XI. The staff notes that 10 CFR 50.55a(b)(2) imposes certain limitations/modifications on the use of this code and one such limitation (reference 10 CFR 50.55a(b)(2)(xix)) states that when using the substitution of alternative methods, the 1997 Addenda of IWA-2240 must be used. Staff review of the DCD identified that DCD Section 5.2.4.3.2 states, "IWA 2240 as written in the 1997 Addenda of ASME Section XI (or later Edition/Addenda that is approved under 10 CFR 50.55a) is used when applying these provisions." Staff review identified that the parenthetical statement in this sentence could be interpreted to mean that an applicant could use later code editions approved by the staff and incorporated in to 10 CFR 50.55a(b)(2). Please revise FSAR Section 5.2.4 to clarify that use of the provisions of Subsubarticle IWA-2240, "Alternative Examinations," is limited to the 1997 Addenda as described in the limitation of 10 CFR 50.55a(b)(2)(xix).

Dominion Response

In DCD, Revision 5, the applicable sentence in Section 5.2.4.3.2 was revised to clarify the use of IWA-2240 addenda. The revised sentence states:

IWA-2240 as written in the 1997 Addenda of ASME Section XI is used when applying these provisions.

This DCD change addresses the subject of the RAI.

Proposed COLA Revision

None

ENCLOSURE 7

Response to NRC RAI Letter 014

RAI Question 05.02.04-6

NRC RAI 05.02.04-6

FSAR Section 5.2.4, Preservice and Inservice Inspection and Testing of Reactor Coolant Pressure Boundary, incorporates by reference the ESBWR DCD with STD COL 5.2-1-H. The staff notes that preservice and inservice examinations required by 10 CFR 50.55a and ASME code, Section XI, include examinations of Class 1 component supports. Staff review identified that neither the DCD nor the FSAR address examination of component supports. Please revise FSAR Section 5.2.4 to clarify that the ISI/PSI programs include component supports of Class 1, 2 and 3 components.

Dominion Response

In DCD, Revision 5, Section 5.2.4.2 was revised to address supports for Class 1 components.

DCD Section 6.6.2 addresses supports for Class 2 and Class 3 components.

These DCD sections adequately address the RAI.

Proposed COLA Revision

None

ENCLOSURE 8

Response to NRC RAI Letter 014

RAI Question 05.02.04-7

NRC RAI 05.02.04-7

FSAR Section 5.2.4 incorporates by reference the ESBWR DCD, Revision 4, with standard COL item STD COL 5.2-1-H. DCD Section 5.2.4.3.4 addresses the qualification of personnel and examination systems for ultrasonic examination in accordance with ASME Section XI, Appendices VII and VIII. The staff notes that Section XI also includes the qualification of ultrasonic examination procedures in accordance with Appendix VIII. Please revise FSAR Section 5.2.4 to address the qualification of ultrasonic examination procedures consistent with ASME Section XI, Appendix VIII.

Dominion Response

In DCD, Revision 5, Section 5.2.4.3.4 was revised to address the qualification of ultrasonic examination procedures. The revised section states:

Personnel performing ultrasonic examinations shall be qualified in accordance with ASME Section XI, Appendix VII. Ultrasonic examination systems (personnel, procedures, and equipment) shall be qualified in accordance with industry accepted programs for implementation of ASME Section XI, Appendix VIII, as modified by 10 CFR 50.55a(b)(2)(xiv), (xv), (xvi) and (xxiv).

This DCD change addresses the subject of the RAI.

Proposed COLA Revision

None