

## **KHNP Response to Issues - DCD Section 5.2.1.1**

### **Issue #7 (From Jason Huang w/3.9.4 Issues)**

Codes and standards are not consistently stated throughout the DCD. The control element drive mechanism (CEDM) for example is listed as “ASME Section III Class 1” in Table 5.2-1, yet is listed as “ASME Section III NB-2007 with 2008 addenda,” in Table 3.2-1 (9 of 86), item 11a. Designations should be checked across the DCD and cited with a consistent level of specificity, such as ASME BPV Code Section III or ASME BPV Code Section XI. Additionally, please clarify this statement in DCD Section 5.2.1.1, “The components and code classes that are listed in Table 5.2-1 are in accordance with the provisions of 10 CFR 50.55a with this exception: the applicable ASME Code edition for the APR1400 is the 2007 Edition with 2008 Addenda.

### **Response**

The designations and level of specificity for a table in the DCD may be different from those of other tables according to the purpose of the table. The purpose of Table 5.2-1 is to identify component codes (i.e., applicable ASME Code Class) and code editions/addenda required by 10 CFR 50.55a for each RCPB component.

For consistency with Table 3.2-1, Table 5.2-1 will be revised to have a separate column “Codes.” For example, “ASME Section III NB” will be listed to be consistent with Table 3.2-1 as shown in Attachment 1. “Primary component supports” will be deleted because the table is for RCPB components and the supports themselves are not RCPB. “RCP auxiliaries” will be revised to be specific. “ASME Section III NC” and “Class 2” will be added for “Pipe and valves”. The phrase “with this exception” in the last paragraph of section 5.2.1.1 will be deleted since it is unnecessary.

### **Impact on DCD**

Table 5.2-1 and DCD 5.2.1.1 will be revised as indicated on the attached markup.

### **Impact on PRA**

There is no impact on the PRA.

### **Impact on Technical Specifications**

There is no impact on the Technical Specifications.

### **Impact on Technical/Topical/Environmental Reports**

There is no impact on any Technical, Topical or Environmental Reports.

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Table 5.2-1

Reactor Coolant System Pressure Boundary Code Requirements <sup>(1)</sup>

(2)

Components	Codes and Classes	Classes
RV, steam generators (primary side), pressurizer	ASME Section III, <del>Nuclear Power Plant Components, Class 1</del> NB	1
RCP (structural portions necessary to provide reasonable assurance of the integrity of the RCPB)	ASME Section III, <del>Nuclear Power Plant Components, Class 1</del> NB	1
RCP auxiliaries (high pressure cooler-cooling water side)	ASME Section III, <del>Nuclear Power Plant Components, Class 3</del> ND	3
Pipe and valves	ASME Section III, <del>Nuclear Power Plant Components, Class 1</del> NB/NC	1/2
Pressurizer spray and pilot-operated safety relief valves	ASME Section III, <del>Nuclear Power Plant Components, Class 1</del> NB	1
Steam generators (secondary side)	ASME Section III, <del>Nuclear Power Plant Components, Class 2</del> NC	2
Control element drive mechanisms (CEDMs)	ASME Section III, <del>Nuclear Power Plant Components, Class 1</del> NB	1
Primary component supports	ASME Section III, <del>Nuclear Plant Component Supports, Class 1</del>	Delete

(1) The codes listed in this table are construction codes. The ASME Code of 2007 Edition with 2008 Addenda is applicable to the APR1400 for construction. In addition, the components listed in this table are designed and constructed to meet the test and inspection requirements of the ASME OM and ASME Section XI, Rules for Inservice Inspection, 2007 Edition with 2008 Addenda.

, 2004 Edition with 2005 and 2006 Addenda,

Construction and welding of structures, systems, and components is in accordance with ASME Code, Section III. Inspections of structures, systems, and components constructed in accordance with ASME Section III are in accordance with ASME Code, Section V (Reference 37). Qualification of Welding Procedures and Welding Operators is in accordance with ASME Code, Section IX (Reference 38). Specifications for construction base materials and welding materials are in accordance with ASME Code, Section II.

(2) The COL applicant is to address the portions of the later editions and addenda of ASME Code (COL 5.2(16)).

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of the ASME Code for Operation and Maintenance of Nuclear Power Plants (OM Code) (Reference 7) to the RCPB.

The components and code classes that are listed in Table 5.2-1 are in accordance with the provisions of 10 CFR 50.55a ~~with this exception: the applicable ASME Code edition for the APR1400 is the 2007 Edition with 2008 Addenda.~~ Table 3.2-1 provides the component classifications of pressure vessels, piping, pumps, valves, and storage tanks, along with the applicable component codes. The proposed inspections, tests, analyses, and acceptance criteria (ITAAC), as required by 10 CFR 52.47(b)(1) (Reference 8), are addressed in Tier 1 of the APR1400 DCD based on the selection criteria in Section 14.3.

### 5.2.1.2 Compliance with Applicable Code Cases

RCPB components are designed and fabricated in accordance with ASME Section III.

The applicable ASME Code Cases that are in conformance with the requirements of GDC 1 and 10 CFR 50.55a and that are used in the plant design and manufacturing are listed in Table 5.2-4. NRC RGs 1.84 (Reference 9), 1.147 (Reference 10), and 1.192 (Reference 11) are used in determining the applicable ASME Code Cases. The COL applicant is to address the addition of ASME Code Cases that are approved in NRC RG 1.84 (COL 5.2(1)). The COL applicant is to address the ASME Code Cases invoked for the ISI program of a specific plant (COL 5.2(2)). The COL applicant is to address the ASME Code Cases invoked for operation and maintenance activities (COL 5.2 (3)).

### 5.2.2 Overpressure Protection

Overpressure protection systems include all pressure-relieving devices for the following systems:

- a. Reactor coolant system (RCS)
- b. Primary side of auxiliary or emergency systems connected to the RCS
- c. Secondary side of steam generators (SGs)

## **KHNP Response to Issues - DCD Section 5.2.1.1**

In accordance with Title 10 of the Code of Federal Regulations (10 CFR) Section 50.55a, systems and components of pressurized water reactors like APR1400 are to meet the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code). The requirement ensures that facilities will also meet the requirements of 10 CFR Part 50, Appendix A, General Design Criterion 1, such that structures, systems, and components important to safety shall be designed, fabricated, erected, and tested to quality standards commensurate with the importance of the safety function to be performed. The staff has identified the following issues in regards to the applicant's use of ASME Codes and Standards Rule, 10 CFR 50.55a.

### **Issue #1 (From MCB Issue List)**

For the APR1400 Final Safety Analysis Report (FSAR), it is identified that the components and code classes that are listed in FSAR Table 5.2-1 are in accordance with the provisions of 10 CFR 50.55a in that the applicable ASME Code edition is the 2007 Edition with the 2008 Addenda.

For clarity, a combined license (COL) action item should be included in the APR1400 FSAR which states that a COL applicant referencing the APR1400 design will be expected to ensure that the design is consistent with the construction practices (including inspection and examination methods) of the ASME Code edition and addenda of the APR1400. If the ASME Code edition and addenda cited in a COL application differ from that specified in the APR1400 FSAR, the COL applicant must identify the portions of the later editions and addenda for NRC staff review and approval.

### **Response**

A COL action item will be added to address this issue as shown in Attachment 2.

### **Impact on DCD**

DCD Section 5.2.6 and Table 1.8-2 will be revised as indicated on the attached markup.

### **Impact on PRA**

There is no impact on the PRA.

### **Impact on Technical Specifications**

There is no impact on the Technical Specifications.

### **Impact on Technical/Topical/Environmental Reports**

There is no impact on any Technical, Topical or Environmental Reports.

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- COL 5.2(12) The COL applicant may invoke ASME Code Cases listed in NRC RG 1.147 for the ISI program.
- COL 5.2(13) The COL applicant is to prepare and implement a boric acid corrosion (BAC) prevention program in conformance with Generic Letter 88-05.
- COL 5.2(14) The COL applicant is to prepare the preservice inspection and testing program.
- COL 5.2(15) The COL applicant is to address and develop the milestones for the preparation and implementation of the procedure for operator responses to prolonged low-level leakage.

5.2.7 References COL 5.2(16) The COL applicant is to address the portions of the later editions and addenda of ASME Code .

1. ANSI/ANS 51.1-1983, "American Nation Standard Nuclear Safety Criteria for the Design of Stationary Pressurized Water Reactor Plants," American Nuclear Society, 1983.
2. ASME Boiler and Pressure Vessel Code, Section III, "Rules for Construction of Nuclear Facility Components," The American Society of Mechanical Engineers, the 2007 Edition with the 2008 Addenda.
3. 10 CFR 50.55a, "Codes and Standards," U.S. Nuclear Regulatory Commission.
4. Regulatory Guide 1.26, "Quality Group Classification and Standards for Water-, Steam-, and Radioactive-Waste-Containing Components of Nuclear Power Plants," Rev. 4, U.S. Nuclear Regulatory Commission, March 2007.
5. 10 CFR Part 50, Appendix A, "General Design Criteria for Nuclear Power Plants," U.S. Nuclear Regulatory Commission.
6. ASME Boiler and Pressure Vessel Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," The American Society of Mechanical Engineers, the 2007 Edition with the 2008 Addenda.
7. ASME Boiler and Pressure Vessel Code, OM Code, "Code for Operation and Maintenance of Nuclear Power Plants," The American Society of Mechanical Engineers, the 2004 Edition with the 2005 and the 2006 Addenda.

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Table 1.8-2 (8 of 29)

Item No.	Description
COL 5.2(8)	The COL applicant is to provide and develop the implementation milestones for the inservice inspection and testing program for the RCPB, in accordance with ASME Code Section XI and 10 CFR 50.55a.
COL 5.2(9)	The COL applicant is to address the provisions to accessibility of Class 1 components for ISI if the design of the APR1400 Class 1 component is changed from the DCD design.
COL 5.2(10)	The COL applicant is to provide the list of Code exemptions in the ISI program of the specific plants, if it exists.
COL 5.2(11)	The COL applicant is to prepare and provide any requests for relief from the ASME Code requirements that are impracticable as a result of limitations of component design, geometry, or materials of construction for the specific plants, if necessary. The request will contain the information on applicable Code requirements, alternative ISI method, and justification.
COL 5.2(12)	The COL applicant may invoke ASME Code Cases listed in NRC RG 1.147 for the ISI program.
COL 5.2(13)	The COL applicant is to prepare and implement a boric acid corrosion (BAC) prevention program compliant with Generic Letter 88-05.
COL 5.2(14)	The COL applicant is to prepare the preservice inspection and testing program.
COL 5.2(15)	The COL applicant is to address and develop milestones for preparation and implementation of the procedure for operator responses to prolonged low level leakage.
COL 5.3(1)	The COL applicant is to provide a reactor vessel material surveillance program for a specific plant.
COL 5.3(2)	The COL applicant is to develop P-T limit curves based on plant-specific data.
COL 5.3(3)	The COL applicant is to verify the $RT_{PTS}$ value and the USE at EOL based on plant-specific material property and neutron fluences.
COL 5.3(4)	The COL applicant is to provide and develop the inservice inspection and testing program for the RCPB, in accordance with ASME Section XI and 10 CFR 50.55a.
COL 5.4(1)	The COL applicant is to prepare operational procedures and maintenance programs as related to leak detection and contamination control of RCS.
COL 5.4(2)	The COL applicant is to maintain complete documentation of system design, construction, design modifications, field changes, and operations of RCS.
COL 5.4(3)	The COL applicant is to prepare operational procedures and maintenance programs as related to leak detection and contamination control of SCS.
COL 5.4(4)	The COL applicant is to maintain complete documentation of system design, construction, design modifications, field changes, and operations of SCS.
COL 5.4(5)	The COL applicant is to verify the as-built RV support material properties and 60-year neutron fluence.

COL 5.2(16) The COL applicant is to address the portions of the later editions and addenda of ASME Code .

## **KHNP Response to Issues - DCD Section 5.2.1.1**

### **Issue #2**

During the review of the APR1400 the term “ASME Code” and “Code” are used throughout the application. For clarity, revise FSAR Section 5.2.1.1 to add statements that identify the following:

- Construction and welding of structures, systems, and components shall be in accordance with ASME Boiler and Pressure Vessel Code, Section III, “Rules for Construction of Nuclear Facility Components.”
- Inservice Inspection shall be in accordance with ASME Boiler and Pressure Vessel Code, Section XI, “Rules for Inservice Inspection of Nuclear Power Plant Components.”
- Inspections of structures, systems, and components constructed in accordance with ASME Section III shall be in accordance with ASME Boiler and Pressure Vessel Code, Section V, “Non Destructive Examination.”
- Qualification of Welding Procedures and Welding Operators shall be in accordance with ASME Boiler and Pressure Vessel Code Section IX, “Welding and Brazing Qualifications.”
- Specifications for construction base materials and welding materials shall be in accordance with ASME Boiler and Pressure Vessel Code, Section II, “Material Specifications.”
- Operation and maintenance of nuclear power plants shall be in accordance with the ASME Boiler and Pressure Vessel Code, Operations and Maintenance (OM) Code, “Code for Operation and Maintenance of Nuclear Power Plants.”

### **Response**

Statements will be added to address this issue as shown in Attachment 3.

### **Impact on DCD**

DCD Section 5.2.7 will be revised as indicated on the attached markup.

### **Impact on PRA**

There is no impact on the PRA.

### **Impact on Technical Specifications**

There is no impact on the Technical Specification.

### **Impact on Technical/Topical/Environmental Reports**

There is no impact on any Technical, Topical or Environmental Reports

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34. Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants," U.S. Nuclear Regulatory Commission, March 17, 1988.
35. Regulatory Guide 1.29, "Seismic Design Classification," Rev. 4, U.S. Nuclear Regulatory Commission, March 2007.
36. Regulatory Guide 1.45, "Guidance on Monitoring and Responding to Reactor Coolant System Leakage," Rev. 1, U.S. Nuclear Regulatory Commission, May 2008.



37. ASME Boiler and Pressure Vessel Code, Section V, "Nondestructive Examination," The American Society of Mechanical Engineers, the 2007 Edition with the 2008 Addenda.



38. ASME Boiler and Pressure Vessel Code, Section IX, "Welding and Brazing Qualifications," The American Society of Mechanical Engineers, the 2007 Edition with the 2008 Addenda.



## **KHNP Response to Issues - DCD Section 5.2.1.1**

### **Issue #3**

For the APR1400 FSAR, it is identified that the components and code classes that are listed in FSAR Table 5.2-1 are in accordance with the provisions of 10 CFR 50.55a in that the applicable ASME Code edition is the 2007 Edition with the 2008 Addenda. In APR1400 FSAR Section 5.2.7, "References," item number 7 identifies that the OM Code will be used for the operation and maintenance of nuclear power plants, however, the 2004 Edition and the 2005 and 2006 Addenda of the ASME OM Code is referenced. Please provide justification for using an earlier edition of the OM Code.

### **Response**

This issue was withdrawn and no response was required.