

Response to Action Item 5-5 Section 5.2.4

MCB Issue List Regarding APR-1400, FSAR Section 5.2.4

Issue #1 (AI 5-5.1)

The Design Control Document (DCD) states that this inservice inspection (ISI) and testing program for Quality Group A components of the reactor coolant pressure boundary (RCPB) conforms with the guidelines of Title 10 of the Code of Federal Regulations (10 CFR) Section 50.55a and 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 32. However, given that 10 CFR 50.55a and GDC 32 are regulatory requirements, and not guidelines, the intent of this statement is unclear to the staff.

Confirm that the intent of the inservice inspection and testing program is to meet the requirements of 10 CFR 50.55a and GDC 32 and revise Final Safety Analysis Report (FSAR) Section 5.2.4 accordingly.

Response

The first sentence of FSAR Section 5.2.4.1 will be revised as follows:

"The inservice inspection (ISI) and testing program for Quality Group A components of the RCPB (ASME Section III, Class 1 components) conforms with the regulatory requirements of 10 CFR 50.55a and GDC 32 of 10 CFR Part 50, Appendix A."

Impact on DCD

DCD 5.2.4.1 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 Specification.

Impact on Technical/Topical/Environmental Reports

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

APR1400 DCD TIER 2**5.2.4 Inservice Inspection and Testing of the Reactor Coolant Pressure Boundary****5.2.4.1 Inservice Inspection and Testing Program**

~~The inservice inspection (ISI) and testing program for quality Group A components of the RCPB (ASME Section III, Class 1 components) conforms with the guidelines of 10 CFR 50.55a and GDC 32 of 10 CFR Part 50, Appendix A.~~ The program reflects the principles and intent of ASME Section XI and OM Code. The purpose of the inservice inspection program is to periodically monitor the systems or components requiring inservice inspection in order to identify the systems or components that do not meet acceptance standards and to make the necessary repairs.

The COL applicant is to prepare the inservice inspection program. The COL applicant is to provide and develop the implementation of the inservice inspection and testing program for the RCPB, in accordance with 10 CFR 50.55a (COL 5.2(8)).

Revise. "The inservice inspection (ISI) and testing program for Quality Group A components of the RCPB (ASME Section III, Class 1 components) conforms with the regulatory requirements of 10 CFR 50.55a and GDC 32 of 10 CFR Part 50, Appendix A."

The ISI and inservice testing (IST) programs consist of the following three subprograms:

- a. The component inspection program, which includes nondestructive inspection of major components, piping system and support system
- b. The pump and valve inservice testing program, which requires operability testing of selected pumps and valves
- c. The hydrostatic testing program

The NSSS design provides reasonable assurance that the reactor coolant pressure boundary has an accessibility to perform the preservice and inservice inspections. The pump and valve inservice testing is described in Subsections 3.9.6.2 and 3.9.6.3.

Response to Action Item 5-5 Section 5.2.4

MCB Issue List Regarding APR-1400, FSAR Section 5.2.4

Issue #2 (AI 5-5.2)

The applicant's definition of the system boundary subject to inspection is acceptable if it is in agreement with the definition of the reactor coolant pressure boundary (see 10 CFR 50.2) and encompasses all ASME Code Class 1 components. FSAR Section 5.2.4.1.1 states that the reactor pressure vessel, pressurizer, primary side of the steam generator, and associated piping, pumps, valves, bolting, and component supports are subject to inspection. The staff agrees that the aforementioned components are subject to inspection. However, it is unclear whether the definition of the system boundary provided in the FSAR is in agreement with the definition of the RCPB and encompasses all ASME Code Class 1 components subject to inspection.

To address this issue, revise FSAR Section 5.2.4.1.1 to describe, in detail, the system boundary subject to inspection and clearly state whether the system boundary encompasses all ASME Code Class 1 pressure-retaining components.

Response

The following two sentences will be incorporated into the first paragraph of FSAR 5.2.4.1.1.

"The reactor pressure vessel, pressurizer, primary side of the steam generator and associated piping, pumps, valves, and bolting, and their component supports, including RCPB (reactor coolant pressure boundary) components are subject to inspection."

"All ASME Code Class 1 pressure-retaining components are subject to inspection."

Impact on DCD

DCD 5.2.4.1.1 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 Specification.

Impact on Technical/Topical/Environmental Reports

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

APR1400 DCD TIER 2**5.2.4.1.1 System Boundary Subject to Inspection**

~~The reactor pressure vessel, pressurizer, primary side of the steam generator and associated piping, pumps, valves, bolting, and component supports are subjected to inspection.~~

The high-energy system piping between containment isolation valves receives an augmented ISI as described in Subsection 6.6.8.

5.2.4.1.2 Arrangement of Systems and Components to Provide Accessibility

Accessibility to equipment for maintenance, testing, and inspection is a basic element of the APR1400 design process. The layout provides adequate working space and access for inspection.

Class 1 components of the RCPB in the steam generator and associated piping, pumps, valves, and bolting, and their component supports, including RCPB (reactor coolant pressure boundary) components are subject to inspection. All ASME Code Class 1 pressure-retaining components are subject to inspection.

Revise.

“The reactor pressure vessel, pressurizer, primary side of the steam generator and associated piping, pumps, valves, and bolting, and their component supports, including RCPB (reactor coolant pressure boundary) components are subject to inspection.”

“All ASME Code Class 1 pressure-retaining components are subject to inspection.”

The COL applicant is to address the 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 (9)).

The provisions for access for examination of the RCPB are as follows:

a. Reactor vessel and closure head

1) From inside the vessel:

All internals of the reactor vessel, which is an open structure offering insignificant impediment to access, are removable making the entire inner surface of the vessel, including the beltline welds and the weld zones of the internal load-carrying structure attachments, available for the required surface and volumetric inspections. Provisions are made in the plant design to allow for the removal and storage of all vessel internals (except the flow skirt) during inservice inspection. The surveillance capsules assemblies are

Response to Action Item 5-5 Section 5.2.4

MCB Issue List Regarding APR-1400, FSAR Section 5.2.4

Issue #3 (AI 5-5.3)

Operating experience has shown that a significant number of dissimilar metal welds and austenitic welds in pressurized water reactors (PWRs) have suffered primary water stress corrosion cracking (PWSCC). To provide a means for monitoring for PWSCC in new plants, the 2007 Edition with the 2008 Addenda of ASME Code, Section XI requires that dissimilar metal welds and austenitic welds in piping be ultrasonically examined from both sides. When examination from both sides is not possible, procedures and personnel qualified for single-sided examination in accordance with ASME Code, Section XI, Appendix VIII, with all flaws on the opposite side of the weld, shall be used to examine the required volume. When describing the provisions in the APR1400 design that enable access to perform the required examinations, the applicant did not describe whether single or two-sided access would be provided to dissimilar metal and austenitic welds. This distinction is important because the ASME Code requirements differ depending upon the access provided.

To address the staff's concern, revise FSAR Section 5.2.4 to state whether provisions for two-sided access for ultrasonic examination of piping welds are incorporated within the APR1400 design. If two-sided access cannot be obtained to perform ultrasonic examination, the applicant should discuss how the requirements of 10 CFR 50.55a(g) and the ASME Code will be met.

Response

The following sentence will be added into FSAR Section 5.2.4.1 prior to the last sentence.

"Dissimilar metal welds and austenitic welds in piping will be ultrasonically examined from both sides. When ultrasonic examination from both sides is not possible, procedures, equipment and personnel qualified for single-sided ultrasonic examination in accordance with the ASME Code, Section XI, Appendix VIII, with all flaws on the opposite side of the weld, are used to examine the required volume."

Impact on DCD

DCD 5.2.4.1 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 Specification.

Impact on Technical/Topical/Environmental Reports

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

APR1400 DCD TIER 2**5.2.4 Inservice Inspection and Testing of the Reactor Coolant Pressure Boundary****5.2.4.1 Inservice Inspection and Testing Program**

The inservice inspection (ISI) and testing program for quality Group A components of the RCPB (ASME Section III, Class 1 components) conforms with the guidelines of 10 CFR 50.55a and GDC 32 of 10 CFR Part 50, Appendix A. The program reflects the principles and intent of ASME Section XI and OM Code. The purpose of the inservice inspection program is to periodically monitor the systems or components requiring inservice inspection in order to identify the systems or components that do not meet acceptance standards and to make the necessary repairs.

The COL applicant is to prepare the inservice inspection and testing program. 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 Section XI and 10 CFR 50.55a (COL 5.2(8)).

The ISI and inservice testing (IST) programs consist of the following three subprograms:

- a. The component inspection program, which includes nondestructive inspection of major components, piping system and support system
- b. The pump and valve inservice testing program, which requires operability testing of selected pumps and valves
- c. The hydrostatic testing program

The NSSS design provides reasonable assurance that the reactor coolant pressure boundary has an accessibility to perform the preservice and inservice inspections. The pump and valve inservice testing is described in Subsections 3.9.6.2 and 3.9.6.3.

Add here.

“Dissimilar metal welds and austenitic welds in piping will be ultrasonically examined from both sides. When ultrasonic examination from both sides is not possible, procedures, equipment and personnel qualified for single-sided ultrasonic examination in accordance with the ASME Code, Section XI, Appendix VIII, with all flaws on the opposite side of the weld, are used to examine the required volume.”

Response to Action Item 5-5 Section 5.2.4

MCB Issue List Regarding APR-1400, FSAR Section 5.2.4

Issue #5 (AI 5-5.5)

10 CFR 50.55a states that systems and components of PWRs must meet the requirements of the ASME Code as specified in the regulation. The ASME Code requirement that addresses the qualifications of nondestructive examination (NDE) personnel is ASME Code, Section XI, IWA-2300. FSAR Section 5.2.4.1.3 describes the requirements for qualification of personnel performing ultrasonic examination. However, the FSAR does not describe the requirements for qualification of personnel performing visual, liquid penetrant, magnetic particle, eddy current, or radiographic testing as part of the PSI and ISI program. This information is needed for the staff to determine whether the requirements of ASME Code, Section XI, IWA-2300 are met. Revise FSAR Section 5.2.4.1.3 to describe the methods, procedures, and requirements regarding qualification of all NDE personnel in accordance with the ASME Code.

Response

The following sentence will be included in the second paragraph of FSAR Section 5.2.4.1.3.

"Personnel performing visual, liquid penetrant, magnetic particle, eddy current or radiographic examinations as a part of the PSI or ISI program are to be qualified in accordance with the requirements of IWA-2300 of ASME Code Section XI."

Impact on DCD

DCD 5.2.4.1.3 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

APR1400 DCD TIER 2

General provisions are made for removable insulation, removable shielding, installation of handling machinery, adequate personnel, and equipment access space, and laydown space for all temporarily removed or serviced components. Storage space for the removable insulation panels is also provided. Working room for personnel is provided adjacent to each weld in order to examine all piping system welds manually.

5.2.4.1.3 Examination Categories and Methods

Examinations include liquid penetrant, magnetic particle, or eddy current techniques when surface examination is specified; ultrasonic or radiographic techniques when volumetric examination is specified; and visual inspection techniques that are used to determine surface condition of components and for evidence of leakage. Specific techniques, procedures and equipment, including any special techniques or equipment are in accordance with the requirements of ASME Section XI and are defined in the inservice inspection program. Preservice inspection (PSI) and subsequent inservice inspection are conducted with equivalent equipment and techniques.

The visual, surface, and volumetric examination techniques and procedures agree with the requirements of Subarticle IWA-2200, IWB-2000, and Table IWB-2500-1 of ASME Section XI. The methods, procedures, and requirements for qualification of personnel performing ultrasonic examination are in accordance with the requirements of ASME Section XI, Appendix VII. The performance demonstration for ultrasonic examination procedure, equipment, and personnel used to detect and size flaws is in accordance with the requirements of ASME Section XI, Appendix VIII.

The data from the various baseline examinations, collected in accordance with the related procedures, are entered into a report with tabulated results. The report describes the scope of the inspection, the procedures utilized, the equipment utilized, names and qualifications of personnel, and all the examination results including all instrument calibration criteria in sufficient detail to provide reasonable assurance of repeatability for each examination. The categories and requirements appropriate for each examination area follow the categories and requirements specified in Table IWB 2500-1 of ASME Section XI. An inservice inspection is provided in accordance with AS

Add here.
 "Personnel performing visual, liquid penetrant, magnetic particle, eddy current or radiographic examinations as a part of the PSI or ISI program are to be qualified in accordance with the requirements of IWA-2300 of ASME Code Section XI."

Response to Action Item 5-5 Section 5.2.4

MCB Issue List Regarding APR-1400, FSAR Section 5.2.4

Issue #6 (AI 5-5.6)

10 CFR 50.55a states that systems and components of PWRs must meet the requirements of the ASME Code as specified in the regulation. The ASME Code requirement that addresses Class 1 components exempt from examination is ASME Code, Section XI, IWB-1220.

Specifically, if the criteria of ASME Code, Section XI, IWB-1220 are met, then certain ASME Code Class 1 components (or portions of components) may be exempted from the volumetric and surface examination requirements of ASME Code, Section XI, IWB-2500. After reviewing the information provided in FSAR Section 5.2.4.1.7, the staff could not determine if any ASME Code Class 1 components (or portions of components) would be exempted from examination for the APR1400 design.

Identify whether any ASME Code Class 1 components (or portions of components) are to be exempted from the ASME Code, Section XI, IWB-2500 examination requirements for the APR1400 design. If so, then revise FSAR Section 5.2.4 to identify the ASME Code Class 1 components (or portions of components) that the applicant proposes to exempt from the ASME Code, Section XI, IWB-2500 examination requirements and include sufficient information in FSAR Section 5.2.4 for the staff to determine whether the criteria of ASME Code, Section XI, IWB-1220 are met for those components (or portions of components).

Response

For the inservice inspection of APR1400, there are no ASME Code Class 1 components (or portions of components) that are to be exempted from ASME Code, Section XI, IWB-2500 examination requirements, except for the items allowed by ASME Code, Section XI, IWB-1220.

Impact on DCD

There is no impact on the DCD.

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

Response to Action Item 5-5 Section 5.2.4

MCB Issue List Regarding APR-1400, FSAR Section 5.2.4

Issue #7 (AI 5-5.7)

FSAR Section 5.2.4.1.8 states that the Combined License (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 specific plants, if necessary. However, the staff would note the following regulatory requirements:

- 10 CFR 50.55a(g)(3)(i) requires that ASME Code Class 1 components be designed and provided with access to enable the performance of inservice examination of these components. Therefore, limitations related to component design, geometry and materials of construction must be eliminated during the design stage to enable the performance of the required examinations.
- 10 CFR 50.55a(g)(5)(iii) states that determinations of impracticability must be based on demonstrated limitations experienced when attempting to comply with the ASME Code requirements during the ISI interval for with the request is being submitted. As such, relief requests, as defined in 10 CFR 50.55a(g), cannot be made prior to commercial operation of the plant.

Based on the above, there should be no requests for relief from ASME Code, Section XI examination requirements at the design certification or COL application stage. As such, the staff requests that FSAR Section 5.2.4 be revised to remove COL information item 5.2(11).

Response

The FSAR 5.2.4.1.8, FSAR 5.2.6 and Table 1.8-2 will be revised to remove COL information item 5.2(11). The whole paragraph of FSAR 5.2.4.1.8 and COL information item 5.2(11) of FSAR 5.2.6 will be removed as follows:

~~“5.2.4.1.8 Relief from ASME Code Requirements~~

~~The COL applicant is to prepare and provide any requests for relief from the ASEM 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(11)).”~~

~~“5.2.6 Combined License Information”~~

~~“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.”~~

Response to Action Item 5-5 Section 5.2.4

“Table 1.8-2 (8 of 29)”

~~“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.”~~

Impact on DCD

DCD 5.2.4.1.8, 5.2.6 and Table 1.8-2 (8 of 29) 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

APR1400 DCD TIER 2~~5.2.4.1.8 Relief from ASME Code Requirements (Delete)~~

~~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 specific plants, if necessary. The request is to contain the information on applicable ASME Code requirements, alternative ISI methods, and justification (COL 5.2(11)).~~

5.2.4.1.9 Code Cases

The COL applicant may invoke ASME Code Cases listed in NRC RG 1.147 for the ISI program (COL 5.2(12)).

5.2.4.1.10 Other Inspection Program

The COL applicant is to prepare and implement a boric acid corrosion (BAC) prevention program in conformance with Generic Letter 88-05 (Reference 34)(COL 5.2(13)). The BAC program includes the selection of locations of degradation caused by small leakage, identification of small leakage locations, implementation methods of inspection and evaluation, and corrective action procedures for preventing recurrences of leakage.

5.2.4.2 Preservice Inspection and Testing Program

The preservice examination program is in accordance with the requirements of Article NB-5280 of ASME Section III, Division I. The preservice inspection (PSI) program conforms with the edition and addenda of ASME Section XI, as required by 10 CFR 50.55a(b). ASME Code Cases listed in NRC RG 1.147 that are incorporated by reference in 10 CFR 50.55a(b) are incorporated into the program as necessary.

The PSI program provides detailed information on areas subject to examination as well as methods, acceptance criteria, and extent of preservice examinations.

The COL applicant is to prepare the preservice inspection and testing program (COL 5.2(14)).

APR1400 DCD TIER 2**5.2.6 Combined License Information**

COL 5.2(1) The COL applicant is to address the addition of ASME Code Cases that are approved in NRC RG 1.84.

COL 5.2(2) The COL applicant is to address the ASME Code Cases invoked for the ISI program of a specific plant.

COL 5.2(3) The COL applicant is to address the Code Cases invoked for operation and maintenance activities.

COL 5.2(4) The COL applicant is to address the material specifications, which are not shown in Table 5.2-2, as necessary.

COL 5.2(5) The COL applicant is to specify the version of EPRI's, "Primary Water Chemistry Guidelines," that will be implemented.

COL 5.2(6) The COL applicant is to address the actual, as-procured, fracture toughness data of the RCPB materials to the staff at a predetermined time by an appropriate method.

COL 5.2(7) The COL applicant is to submit the actual, as-procured yield strength of the austenitic stainless steel materials used in RCPB to the staff at a predetermined time agreed-upon by the regulatory body.

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 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.~~
(Delete)

A2C1400 RPR I EDC T

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) (Delete)	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.

Response to Action Item 5-5 Section 5.2.4

MCB Issue List Regarding APR-1400, FSAR Section 5.2.4

Issue #8 (AI 5-5.8)

The description of the preservice and inservice inspection program should clearly identify which Code Cases, if any, are used. APR1400 FSAR Sections 5.2.4 and 6.6 both indicate that ASME Code Cases listed in Regulatory Guide (RG) 1.147 may be used. However, the applicant did not identify which Code Cases, if any, would be incorporated in the APR1400 design. Therefore, the applicant should revise FSAR Section 5.2.4 (and FSAR Section 6.6 as/when appropriate) to state which ASME Code Cases, if any, are incorporated into the APR1400 design. The discussion should include the applicability of any ASME Code Cases required by 10 CFR 50.55a (e.g., ASME Code Case N-729-1, N-722-1, etc.).

Response

The ASME Code Cases that expected to be used in preservice and inservice inspection programs of APR1400 are listed as follows. The COL 5.2(2) of FSAR 5.2.6 addresses the ASME Code Cases for the ISI program:

1. ASME Code Cases acceptable without limitations
 - N-460, N-494-4, N-508-3, N-526, N-609, N-613-1, N-624, N-663, N-665, N-706-1, N-731, and N-753
2. ASME Code Cases acceptable with additional limitations
 - N-416-4, N-504-4, N-593, N-597-2, N-639, and N-648-1

The above referenced ASME Code Cases are all approved for usage by Regulatory Guide (RG) 1.147 Rev. 17 and will be incorporated into the preservice and inservice inspection program of APR1400 at the construction stage.

ASME Code Case N-729-1 (Alternative Examination Requirements for PWR Reactor Vessel Upper Heads with Nozzles having Pressure-Retaining Partial-Penetration Welds Section XI, Division 1) is also applied with additional limitation by 10CFR50.55a to the preservice and inservice inspection programs of APR1400. ASME Code Case N-722-1 (Additional Examinations for PWR Pressure Retaining Welds in Class 1 Components Fabricated with Alloy 600/82/182 Materials, Section XI, Division 1) is not applied to APR1400; however, because there are no reactor coolant pressure boundary parts fabricated with Alloy 600/82/182 materials.

Impact on DCD

There is no impact on the DCD.

Impact on PRA

There is no impact on the PRA.

Response to Action Item 5-5 Section 5.2.4

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.

Response to Action Item 5-5 Section 5.2.4

MCB Issue List Regarding APR-1400, FSAR Section 5.2.4

Issue #9 (AI 5-5.9)

For a PWR plant, the applicant must establish an inspection program to detect and correct potential RCPB corrosion caused by boric acid leaks as described in NRC Generic Letter 88-05. To address this issue, the APR1400 DCD provided COL item 5.2(13), which requires that a COL applicant prepare and implement a boric acid prevention program in conformance with GL 88-05. It is acceptable to require a COL applicant to prepare and implement a such a program for a specific plant. However, in addition to describing the actions necessary for a COL applicant, it is the responsibility of the design certification applicant to describe the design features of the APR1400 that enable a COL applicant to effectively perform the required inspections. Therefore, the staff requests that KHNP revise FSAR Section 5.2.4 to describe how specific design features of the APR1400 enable effective boric acid leak detection inspections.

Response

To supplement the design features of the APR1400 that enable effective boric acid leak detection inspections, the following sentence will be added at the end of FSAR 5.2.4.1.10:

“To ensure easy access to the joint areas or surface of components for boric acid corrosion examinations, the insulation covering the joint area or surface of the components to be inspected is designed to be removed easily or to keep sufficient gap between the insulation and the surface of the reactor vessel closure head for the passage of inspection tools.”

Impact on DCD

DCD 5.2.4.1.10 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

APR1400 DCD TIER 2**5.2.4.1.8 Relief from ASME Code Requirements**

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 specific plants, if necessary. The request is to contain the information on applicable ASME Code requirements, alternative ISI methods, and justification (COL 5.2(11)).

5.2.4.1.9 Code Cases

The COL applicant may invoke ASME Code Cases listed in NRC RG 1.147 for the ISI program (COL 5.2(12)).

5.2.4.1.10 Other Inspection Program

The COL applicant is to prepare and implement a boric acid corrosion (BAC) prevention program in conformance with Generic Letter 88-05 (Reference 34)(COL 5.2(13)). The BAC program includes the selection of locations of degradation caused by small leakage, identification of small leakage locations, implementation methods of inspection and evaluation, and corrective action procedures for preventing recurrences of leakage.

5.2.4.2 Preservice Inspection and Testing Program

The preservice examination program is in accordance with the requirements of Article NB-5280 of ASME Section III, Division I. The preservice inspection (PSI) program conforms with the edition and addenda of ASME Section XI, as required by 10 CFR 50.55a(b). ASME Code Cases listed in NRC RG 1.147 that are incorporated by reference in 10 CFR 50.55a(b) are incorporated into the program as necessary.

The PSI program provides detailed information on areas subject to examination as well as methods, acceptance criteria, and extent of preservice examinations.

Add here.

“To ensure easy access to the joint area or surface of components for boric acid corrosion examinations, the insulations covering the joint area or surface of components, where to be inspected, are designed to be removed easily or to keep sufficient gap between insulation and surface of reactor vessel closure head for the passage of inspection tool.”

esting program (COL

Response to Action Item 5-5 Section 5.2.4

MCB Issue List Regarding APR-1400, FSAR Section 5.2.4

Issue #10 (AI 5-5.10)

FSAR Section 5.2.4.2 states that the PSI program conforms with the edition and addenda of ASME Code, Section XI, as required by 10 CFR 50.55(b). 10 CFR 50.55a(b)(2) provides conditions on the use of the 1970 Edition through the 1976 Winter Addenda and the 1977 Edition through the 2007 Edition with the 2008 Addenda of ASME Code, Section XI, Division 1. The statement in the FSAR indicates that any of the aforementioned ASME Code editions and addenda may be used for the PSI program as long as the conditions in 10 CFR 50.55a(b) are met. However, 10 CFR 50.55a(g)(3) places a limit on the ASME Code, Section XI Editions and Addenda that may be used for the PSI program. Specifically, 10 CFR 50.55a(g)(3) requires ASME Code Class 1, 2, and 3 components to meet the PSI requirements applied to the construction of the particular component.

The ASME Code of construction for the APR1400 is the 2007 Edition with the 2008 Addenda of ASME Code, Section III. 10 CFR 50.55a(g)(3) also states that components may meet the requirements set forth in subsequent editions and addenda of the ASME Code provided that they are incorporated by reference into 10 CFR 50.55a. Therefore, the earliest ASME Code edition and addenda that may be used for the APR1400 preservice inspection program is the 2007 Edition with the 2008 Addenda of ASME Code, Section XI.

To address this issue, please revise FSAR Section 5.2.4 to state that the ASME Code edition and addenda of the PSI program will be in accordance with 10 CFR 50.55a(g)(3).

Response

The second sentence of the first paragraph of FSAR Section 5.2.4.2 will be revised as follows:

“The preservice inspection (PSI) program conforms with the edition and addenda of ASME Section XI, as required by 10 CFR 50.55a(b) and 10 CFR 50.55a(g)(3).”

Impact on DCD

DCD 5.2.4.2 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 Specification.

Impact on Technical/Topical/Environmental Reports

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

APR1400 DCD TIER 2**5.2.4.1.8 Relief from ASME Code Requirements**

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 specific plants, if necessary. The request is to contain the information on applicable ASME Code requirements, alternative ISI methods, and justification (COL 5.2(11)).

5.2.4.1.9 Code Cases

The COL applicant may invoke ASME Code Cases listed in NRC RG 1.147 for the ISI program (COL 5.2(12)).

5.2.4.1.10 Other Inspection Program

The COL applicant is to prepare and implement a boric acid corrosion (BAC) prevention program in conformance with Generic Letter 88-05 (Reference 34)(COL 5.2(13)). The BAC program includes the selection of locations of degradation caused by small leakage, identification of small leakage locations, implementation methods of inspection and evaluation, and corrective action procedures for preventing recurrences of leakage.

5.2.4.2 Preservice Inspection and Testing Program

The preservice examination program is in accordance with the requirements of Article NB-5280 of ASME Section III, Division I. ~~The preservice inspection (PSI) program conforms with the edition and addenda of ASME Section XI, as required by 10 CFR 50.55a(b).~~ ASME Code Cases listed in NRC RG 1.147 that are incorporated by reference in 10 CFR 50.55a(b) are incorporated into the program as necessary.

The PSI program provides detailed information on areas subject to examination as well as methods, acceptance criteria, and extent of preservice examinations.

The COL applicant is to prepare the preservice inspection and testing program (COL 5.2(14)).

Revise.

“The preservice inspection (PSI) program conforms with the edition and addenda of ASME Section XI, as required by 10 CFR 50.55a(b) and 10 CFR 50.55a(g)(3).”