

KHNP Response to Issues - DCD Section 5.2.1.2

In accordance with Title 10 of the Code of Federal Regulations (10 CFR) Section 50.55a, systems and components of pressurized water reactors like APR-1400 are to meet the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code). This 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. As part of the applicant's use of the ASME Code, ASME Code Cases may be invoked. The staff has identified the following issues in regards to the applicant's use of ASME Code Cases.

Issue #1

Combined License (COL) Applicant Action Item 5.2(2) requires the COL applicant to identify ASME Code Cases they intend implement as part of their inservice inspection (ISI) program for a specific plant.

For clarity, revise Action Item 5.2(2) to read, "The COL applicant is to address ASME Code Cases approved in NRC Regulatory Guide 1.147 invoked for the ISI program of a specific plant."

Response

COL Applicant Action Item 5.2(2) will be revised to read "The COL applicant is to address ASME Code Cases approved in NRC RG 1.147 invoked for the ISI program of a specific plant" as shown in Attachment 1.

Impact on DCD

DCD Sections 5.2.1.2, 5.2.6 and Table 1.8-2 will be revised as indicated in 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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Issue #2

COL Applicant Action Item 5.2(3) requires the COL applicant to identify ASME Code Cases they intend implement as part of their operations and maintenance program for a specific plant.

For clarity, revise Action Item 5.2(3) to read, "The COL applicant is to address ASME Code Cases approved in NRC Regulatory Guide 1.192 invoked for operations and maintenance activities."

Response

COL Applicant Action Item 5.2(3) will be revised to read "The COL applicant is to address ASME Code Cases approved in NRC RG 1.192 invoked for operations and maintenance activities" as shown in Attachment 1.

Impact on DCD

DCD Sections 5.2.1.2, 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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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)).

approved in NRC RG 1.192

approved in NRC RG 1.147

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)

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Table 1.8-2 (7 of 29)

Item No.	Description
COL 3.12(6)	The COL applicant is to perform the piping stress analysis including thermal stratification effects on SCS suction line.
COL 3.12(7)	The COL applicant is to determine maximum radial thermal expansion at its design temperature.
COL 3.13(1)	The COL applicant is to maintain quality assurance records including CMTRs on ASME Section III Class 1, 2, and 3 component threaded fasteners in accordance with the requirements of 10 CFR 50.71.
COL 3.13(2)	The COL applicant is to submit the preservice and inservice inspection programs for ASME Section III Class 1, 2, and 3 component threaded fasteners to the NRC prior to performing the inspections.
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, which are invoked for the ISI program of 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.

approved in NRC
RG 1.147

ASME

approved in NRC RG 1.192

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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. ASME approved in NRC RG 1.192
- COL 5.2(3) The COL applicant is to address the Code Cases invoked for operation and maintenance activities. approved in NRC RG 1.147
- 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.

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Issue #3

Table 5.2-4 "ASME Section III Code Cases" lists ASME Code Case N-71-18, "Additional Material for Subsection NF, Class 1, 2, 3, and MC Supports Fabricated by Welding, Section III, Division 1," for use in the design of supports for specific nuclear power plant components. The NRC staff has conditioned the use of Code Case N-71-18 in Regulatory Guide 1.84. As such, in order to ensure that the conditions place on Code Case N-71-18 will be met, the staff seeks clarification regarding which specific components it will be applied to.

Revise FSAR Section 5.2.1.2 to identify the components that will be fabricated using Code Case N-71-18 and the material specifications and grades that will be used.

Response

Because Table 5.2-4 refers to Code Case N-71-18 directly, it is more appropriate to add the detailed information for N-71-18 in Table 5.2-4, as shown in Attachment 2, rather than revising FSAR Section 5.2.1.2.

The following sentences will be added as a note for Code Case N-71-18 in Table 5.2-4 "ASME Section III Code Cases":

"Note: Among the Code Cases of Table 5.2.4 "ASME Section III Code Cases," Code Case N-71-18 is used for the materials in support skirt on reactor coolant pump, upper support bracket of steam generator support, and clevis of reactor coolant pump support, lateral support of reactor vessel, base sliding support of steam generator, and pipe supports in contact with the piping which is not RCPB. The detailed material specifications, items and components are provided as below. These materials of Code Cases N-71-18 are applied in conformance with applicable Regulatory Guide 1.84."

Material Specifications of Code Case N-71-18	Items/Components
ASTM A 148 Grade 90/60	Support skirt on reactor coolant pump
	Upper support bracket of steam generator support
	Clevis of reactor coolant pump support
ASTM A 500 Grade B	Pipe supports in contact with the piping which is not RCPB
ASTM A 514 Grade E or Q	Base sliding support of steam generator
ASTM A 572 Grade 50	Lateral support of reactor vessel

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Impact on DCD

Table 5.2-4 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

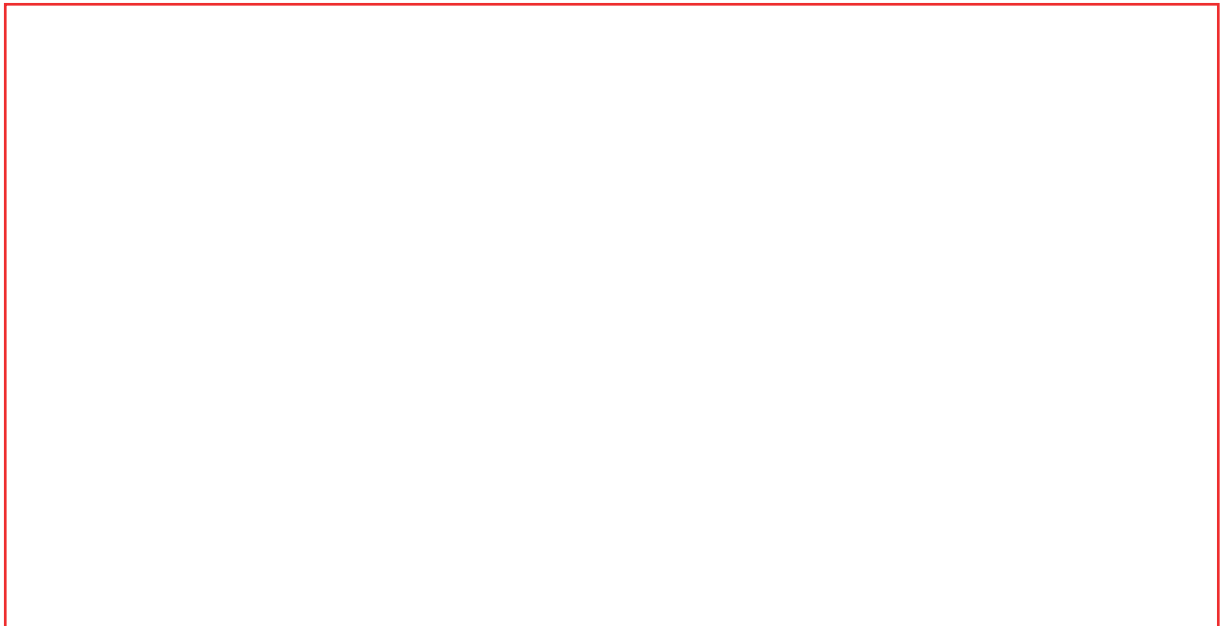
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Table 5.2-4

ASME Section III Code Cases

Code Case	Title
N-4-13	Special Type 403 Modified Forgings or Bars, Section III, Division 1, Class 1 and CS
N-60-5	Materials for Core Support Structures, Section III, Division 1
N-71-18	Additional Materials for Subsection NF, Classes 1, 2, 3, and MC Component Supports Fabricated by Welding, Section III, Division 1
N-249-14	Additional Materials for Subsection NF, Class 1, 2, 3, and MC Component Supports Fabricated without Welding, Section III, Division 1
N-759-2	Alternative Rules for Determining Allowable External Pressure and Comprehensive Stress for Cylinders, Cones, Spheres, and Formed Heads, Section III, Division 1



Add note and table of next page (2/2).

Note: Among the Code Cases of Table 5.2.4 “ASME Section III Code Cases”, Code Case N-71-18 is used for the materials in support skirt on reactor coolant pump, upper support bracket of steam generator support, and clevis of reactor coolant pump support, lateral support of reactor vessel, base sliding support of steam generator, and pipe supports in contact with the piping which is not RCPB. The detailed material specifications, items and components are provided as below. These materials of Code Cases N-71-18 are applied in conformance with applicable Regulatory Guide 1.84.

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Issue #4

The staff notes that FSAR Section 5.2.1.2 does not identify the use of any ASME Section III Code Cases related to Class 2 or 3 piping. The staff is aware of other certified designs which have made use of such Code Cases.

Verify that no ASME Section III Code Cases related to Class 2 or 3 piping are to be used as part of the APR-1400 design or revise FSAR Section 5.2.1 to identify such Code Cases if they will be used as part of the design.

Response

ASME Section III Code Cases related to Class 2 or 3 piping are described in DCD section 3.12.2.2.

Impact on DCD

There is no impact on the DCD.

Impact on PRA

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Impact on Technical Specifications

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