REVISED RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

APR1400 Design Certification

Korea Electric Power Corporation / Korea Hydro & Nuclear Power Co., LTD

Docket No. 52-046

RAI No.:	**40-7958**
SRP Section:	**05.02.01.01 - Compliance With the Codes and Standards Rule, 10 CFR 50.55a**
Application Section:	**5.2.1.1**
Date of RAI Issued:	**6/18/2015**

Question No. 05.02.01.01-2

The requirement in 10CFR50.55a(b)(1)(ii) states that when applying the 1989 Addenda through the latest edition and addenda, applicants or licensees may not apply subparagraphs NB–3683.4(c)(1) and NB–3683.4(c)(2) or Footnote 11 from the 1989 Addenda through the 2003 Addenda, or Footnote 13 from the 2004 Edition through the 2008 Addenda to Figures NC–3673.2(b)–1 and ND–3673.2(b)–1 for welds with leg size less than 1.09 tn. DCD Section 3.12.2.1 states that however, for socket weld leg dimensions, ASME Section III, Footnote 11 to Figure NC/ND-3673.2(b)-1 in the 1989 Edition is used for socket weld with leg size less than 1.09 tn instead of Footnote 13 from 2007 Edition and 2008 Addenda to Figures NC/ND-3673.2(b)-1. This however, is not mentioned in DCD Section 5.2.1.1. The staff requests the applicant to revise DCD Section 5.2.1.1 to clearly state how they are meeting the requirements of 10CFR50.55a(b)(1)(ii) regarding weld leg dimensions.

Response

DCD Section 5.2.1.1 will be revised to refer to DCD Section 3.12.2.1 for the application of ASME Section III for safety-related piping system. Additionally, DCD Section 3.12.2.1 will be revised to address the requirement in 10CFR50.55a(b)(1)(ii) regarding ASME Class 1 weld leg dimensions.

Impact on DCD

DCD Sections 3.12.2.1 and 5.2.1.1 will be revised as indicated in Attachment.

Impact on PRA

There is no impact on the PRA.

Impact on Technical/Topical/Environmental Reports

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

Impact on Technical Specifications

There is no impact on the Technical Specifications.

3.12.2.1 ASME Boiler and Pressure Vessel Code

The safety-related piping system design and analysis for the APR1400 are performed in accordance with the 2007 Edition with 2008 addenda of the ASME Section III (Reference 1).

However, for socket weld leg dimensions, ASME Section III, Footnote 11 to Figure NC/ND-3673.2(b)-1 in the 1989 Edition is used for socket weld with leg size less than 1.09 t_n instead of Footnote 13 from 2007 Edition and 2008 Addenda to Figures NC/ND-3673.2(b)-1.

For ASME class 1 weld leg dimensions, the requirements of subparagraphs NB–3683.4(c)(1) and NB–3683.4(c)(2) are not applied for welds with leg size less than 1.09t_n.

For ASME Class 1 piping, the material and D_0/t requirements of NB-3656(b) are met for all service limits when service limits include reversing dynamic loads, and alternative rules for reversing dynamic loads are used.

The non-safety-related piping system design and analysis for the APR1400 are performed in accordance with the 2010 Edition of ASME B31.1 (Reference 2) and the 2010 Edition of ASME B31.3 (Reference 3).

As described in Subsection 3.12.6, all pipe supports are designed in accordance with Subsection NF of the 2007 Edition with 2008 addenda of the ASME Section III.

3.12.2.2 ASME Code Cases

ASME Code cases applicable for the piping systems and pipe supports of the APR1400 are Code Cases N-122-2, N-71-18, and N-249-14 (Reference 4).

Other ASME Code cases may be used if they are conditionally or unconditionally approved in NRC RG 1.84 (Reference 5).

3.12.2.3 Piping System Design Specification and Design Report

The design specification for all ASME Class 1, 2, and 3 piping systems including loading combinations, design data, and other design inputs is to be developed in accordance with ASME Section III. The design specification defines the code and the edition to be applied

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 Subsection 3.12.2.1 provides a description of the application of ASME Section III for safety-related piping system in accordance with 10 CFR 50.55a.

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)

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Question No. 05.02.01.01-3

The staff requests the applicant to clarify why DCD Section 5.2 references ANSI/ANS 51.1 for the reactor coolant pressure boundary (RCPB) definition instead of 10 CFR 50.2. Also the list of RCPB components in DCD Section 5.2 should include RCS safety and relief valves in accordance with 10CFR50.2. The staff requests the applicant to update DCD Section 5.2 to address these issues.

Response

DCD Section 5.2 will be revised to update the RCPB definition.

Impact on DCD

DCD section 5.2 will be revised as indicated in Attachment.

Impact on PRA

There is no impact on the PRA.

Impact on Technical/Topical/Environmental Reports

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

Impact on Technical Specifications

There is no impact on the Technical Specifications.

5.2 Integrity of the Reactor Coolant Pressure Boundary

This section describes the measures that provide and maintain the integrity of the reactor coolant pressure boundary (RCPB) throughout the facility's design life. The RCPB is defined in accordance with ~~ANSI/ANS 51.1~~ (Reference 1). The RCPB includes all pressure-containing components such as pressure vessels, piping, pumps, and valves that are:

10 CFR 50.2

a. Part of the reactor coolant system (RCS)

b. Connected to the RCS, up to and including the following:

1) The outermost containment isolation valve in piping that penetrates the containment

2) The second of two valves normally closed during reactor operation in piping that does not penetrate the containment

3) The reactor coolant system safety and relief valves.

5.2.1 Conformance with Codes and Code Cases

5.2.1.1 Conformance with 10 CFR 50.55a

RCPB components are designed and fabricated as Class 1 components in accordance with ASME Section III (Reference 2), except for the components that meet the exclusion requirements of 10 CFR 50.55a(c) (Reference 3). RCPB components that meet the exclusion requirements are classified as Quality Group B in accordance with U.S. Nuclear Regulatory Commission (NRC) Regulatory Guide (RG) 1.26 (Reference 4) and are fabricated as Class 2 components in accordance with ASME Section III. The classification of RCPB components conforms with the requirements of 10 CFR Part 50, Appendix A, General Design Criteria (GDC) 1 (Reference 5). The remaining safety-related components are classified as Quality Group C in accordance with NRC RG 1.26 and are fabricated as Class 3 components in accordance with ASME Section III.

Subsection 5.2.4 and Section 6.6 provide a description of the application of ASME Section XI (Reference 6) to the RCPB. Subsection 3.9.6 provides a description of the application

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

10 CFR 50.2, "Definitions", U.S. Nuclear Regulatory Commission.

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.