Response to

Request for Additional Information No. 51 (757,761), Revision 0

9/09/2008

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 05.02.01.01 - Compliance With the Codes and Standards Rule, 10 CFR 50.55a
SRP Section: 05.02.01.02 - Applicable Code Cases
Application Section: 5.2.1.1
EMB1 Branch

Question 05.02.01.01-2:

U.S. EPR DCD Tier 2 Section 5.2.1.1 states that "The RCPB component classification complies with the requirements of GDC 1 and 10 CFR 50.55a. Table 3.2-1, Classification Summary lists the RCPB components, including pressure vessels, piping, pumps, and valves, along with the applicable component codes. Other safety related plant components are classified in accordance with RG 1.26, as specified in Section 3.2." However, Table 3.2-1 is not found in the applicant's submitted DCD Tier 2. AREVA NP is requested to clarify whether Table 3.2-1 is the Table 3.2.2-1 shown in Section 3.2.

Response to Question 05.02.01.01-2:

The correct reference is U.S. EPR FSAR Tier 2, Table 3.2.2-1. U.S. EPR FSAR Tier 2, Section 5.2.1.1 will be revised to make this correction.

FSAR Impact:

U.S. EPR FSAR Tier 2, Section 5.2.1.1 will be revised as described in the response and indicated on the enclosed markup.

Question 05.02.01.01-3:

U.S. EPR FSAR Tier 2 Section 5.2.1.1 states that a combined license (COL) applicant that references the U.S. EPR design certification will identify subsequent ASME code Editions or Addenda that may be used and will determine the consistency of the U.S. EPR design with construction practices (including inspection and examination methods) reflected within the subsequent code editions and addenda identified in the COL application. Section 5.2.1.1 also states that the Code of record for the design of U.S. EPR is the 2004 Edition (no addenda) of the ASME Code. Explain how the EPR design for piping and component will meet 10CFR50.55a(b)(1)(ii) and (iii) by using the ASME 2004 Edition.

Response to Question 05.02.01.01-3:

As noted in the response to RAI No. 41, Question 05.02.01.01-1[1], AREVA NP deleted the Combined License (COL) information item in U.S. EPR FSAR Tier 2, Section 5.2.1.1. Description of how the U.S. EPR piping and components comply with 10 CFR 50.55a(b)(1)(ii) and (iii) is provided in AREVA NP topical report ANP-10264NP, "U.S EPR Piping Analysis and Pipe Support Design Topical Report," which has been reviewed and approved by NRC. Refer to Section 3.1.1 of the Final Safety Evaluation Report for ANP-10264NP[2].

FSAR Impact:

The U.S. EPR FSAR will not be changed as a result of this question.

---

1 E-mail, Ronda Pederson (AREVA NP Inc.) to Getachew Tesfaye (NRC), et al, " Response to U.S. EPR Design Certification Application RAI No. 41, FSAR Ch 5," August 15, 2008.

2 Letter, Getachew Tesfaye (NRC) to Ronnie L. Gardner (AREVA NP Inc), "Final Safety Evaluation Report Regarding ANP-10264NP, 'U.S. EPR Piping Analysis and Pipe Support Design Topical Report' (TAC NO. MD3128)," August 11, 2008 (ML082140858).

Question 05.02.01.01-4:

EPR FSAR Tier 2 Section 3.12.2 references Section 2.0 of AREVA report ANP-10264NP, Revision 0, September 2006, for applicable codes and standards for the design of piping and pipe supports. Section 2.1 of ANP-10264NP states that piping analysis and pipe support design for the U.S. EPR addressed in this topical use the 2001 ASME Code, Section III, Division 1, 2003 addenda as the base code with restrictions identified in the Code of Federal Regulations, 10 CFR 50.55a(b)(1). This is inconsistent with the code and standard cited in FSAR Section 5.2.1.1 that the Code of record for the design of U.S. EPR is the 2004 Edition (no addenda) of the ASME Code. AREVA NP is requested to confirm whether the Code of record for the design of EPR is the 2004 Edition or the 2001 Edition through 2003 addenda of the ASME Code.

Response to Question 05.02.01.01-4:

The code of record for the design of the U.S. EPR is the 2004 Edition of the ASME Code.

FSAR Impact:

The U.S. EPR FSAR will not be changed as a result of this question.

Question 05.02.01.02-3:

EPR FSAR Tier 2 Section 5.2.1.2 states that ASME Section III Code Cases acceptable for use in the U.S. EPR design, subject to the limitations specified in 10 CFR 50.55a, are listed in RG 1.84. Table 5.2-1—ASME Section III Code Cases lists the specific Code Cases used in the U.S. EPR design. However, there are only two code cases listed in Table 5.2-1. The applicant is requested to provide a complete list of Section III Code Cases used for the EPR design, as mentioned in Sections 3.8, 4.5, 5.4 and 10.3, including those used for the design of piping and pipe supports in the report ANP-10264NP.

Response to Question 05.02.01.02-3:

As noted in the NRC question, U.S. EPR FSAR Tier 2, Table 5.2-1 lists the specific code cases, in accordance with RG 1.84, used in the U.S. EPR design. Additionally, U.S. EPR FSAR Tier 2, Section 5.2.1.2 states, "Code Cases pertaining to ASME Code Section III, Division 2 are addressed in Section 3.8." For completeness purposes, code case N-284-1, which is identified in U.S. EPR FSAR Tier 2, Section 3.8, will be added to U.S. EPR FSAR Tier 2, Table 5.2-1. There are no additional code cases identified in U.S. EPR FSAR Tier 2, Sections 4.5, 5.4, and 10.3.

AREVA NP Topical Report ANP-10264NP, which has been approved by NRC, identifies the following code cases: N-122-2, N-318-5, N-319-3, N-391-2, and N-392-3. Four of these code cases (i.e., N-122-2, N-318-5, N-391-2, and N-392-3) have been incorporated in the 2004 edition of the ASME code, Division 1 Nonmandatory Appendix Y. The remaining code case (i.e., N-319-3) is an alternate procedure for evaluation of stresses in butt welding elbows in class 1 piping and will be added to U.S. EPR FSAR Tier 2, Table 5.2-1.

FSAR Impact:

U.S. EPR FSAR Tier 2, Table 5.2-1 will be revised as described in the response and indicated on the enclosed markup.

Question 05.02.01.02-4:

EPR FSAR Tier 2 Section 5.2.1.2 indicated that ASME Section XI Code Cases acceptable for use for in-service inspection (ISI), subject to the limitations specified in 10 CFR 50.55a, are listed in RG 1.147 and described in Section 5.2.4 and Section 6.6. ASME OM Code Cases acceptable for use for in-service testing (IST), subject to the limitations specified in 10 CFR 50.55a, are listed in RG 1.192 and described in Section 3.9.6. FSAR Tier 2 also indicated that a COL applicant that references the U.S. EPR design certification will identify additional ASME Code Cases to be used. In response to RAI 41 05.02.01.02-1, AREVA NP indicates that U.S. EPR FSAR Tier 2 Section 5.2.4.1.8, states that no Code Cases applicable to Class 1 PSI or ISI requirements are invoked for U.S. EPR design. However, in Section 5.2.4.1.8, it also noted that Code Case N-729-1, "Alternative Examination Requirements for PWR Reactor Vessel Upper Heads with Nozzles Having Pressure-Retaining Partial-Penetration Welds" may be used to accomplish the inservice inspection for the reactor pressure vessel head in compliance with requirements of NRC order EA-03-009. AREVA NP is requested to provide a complete list of Code Cases used for EPR in-service inspection (ISI) and a complete list of OM Code Cases used for operation and maintenance associated with in-service testing. The listed Code Cases must be acceptable by RGs 1.147 or 1.192. If not, provide justification to meet requirements in accordance with 10CFR50.55a(b)(3), (b)(4) or (b)(6).

Response to Question 05.02.01.02-4:

U.S. EPR FSAR Tier 2, Section 5.2.4.1.6 says, "No exceptions from code required examinations for Class 1 PSI or ISI are required for the U.S. EPR." AREVA NP will add code case N-729-1 to U.S. EPR FSAR Tier 2, Table 5.2-1. U.S. EPR FSAR Tier 2, Section 6.6 says, "No exemption to or relief from code requirements are requested, or code cases invoked, for Class 2 or Class 3 preservice or inservice inspection requirements for the U.S. EPR." U.S. EPR FSAR Tier 2, Section 3.9.6 does not invoke any code cases for the OM code.

FSAR Impact:

U.S. EPR FSAR Tier 2, Table 5.2-1 will be revised as described in the response and indicated in the enclosed markup.

U.S. EPR Final Safety Analysis Report Markups

5.2 Integrity of the Reactor Coolant Pressure Boundary

This section describes the measures employed to provide and maintain the integrity of the reactor coolant pressure boundary (RCPB) for the plant design lifetime. Consistent with the definition in 10 CFR 50.2, the U.S. EPR RCPB includes all pressure-containing components, such as pressure vessels, piping, pumps, and valves which are part of the reactor coolant system (RCS) or connected to the RCS, up to and including these:

- The outermost containment isolation valve in system piping which penetrates primary reactor containment.
- The second of two valves normally closed during normal reactor operation in system piping which does not penetrate primary reactor containment.
- The RCS safety and relief valves.

Section 3.9 presents the design transients, loading combinations, stress limits, and evaluation methods used in the design analyses of RCPB components and supports to demonstrate that RCPB integrity is maintained.

5.2.1 Compliance with Codes and Code Cases

5.2.1.1 Compliance with 10 CFR 50.55a

The RCPB components are designed and fabricated as Class 1 components in accordance with Section III of the ASME Boiler and Pressure Vessel Code (Reference 1), except for components that meet the exclusion requirements of 10 CFR 50.55a(c) which are designed and fabricated as Class 2 components. The RCPB component classification complies with the requirements of GDC 1 and 10 CFR 50.55a. ~~Table 3.2-1—Classification Summary~~Table 3.2.2-1—Classification Summary lists the RCPB components, including pressure vessels, piping, pumps, and valves, along with the applicable component codes. Other safety-related plant components are classified in accordance with RG 1.26, as specified in Section 3.2.

05.02.01-2

The code of record for the design of the U.S. EPR is the 2004 edition of the ASME Boiler and Pressure Vessel Code (no addenda).

~~A combined license (COL) applicant that references the U.S. EPR design certification will identify subsequent ASME Code editions or addenda that may be used and will determine the consistency of the U.S. EPR design with construction practices (including inspection and examination methods) reflected within the subsequent code editions and addenda identified in the COL application.~~

The application of Section XI of the 2004 edition of the ASME Boiler and Pressure Vessel Code to the U. S. EPR is described in Section 5.2.4 and Section 6.6 The

05.02.01.02-3 and 05.02.01.02-4

Table 5.2-1—ASME ~~Section III~~ Code Cases

Code Case Number	Title
N-60-5	Material for Core Support Structures Section III, Division ~~I~~1~~—February 15, 1994~~
N-71-18	Additional Materials for Subsection NF, Class 1, 2, 3, and MC Supports Fabricated by Welding, Section III, Division 1~~—December 8, 2000~~
N-284-1 [1]	Metal Containment Shell Buckling Design Methods, Section III, Division 1, Class MC
N-319-3	Alternate Procedure for Evaluation of Stresses in Butt Welding Elbows in Class 1 Piping, Section III, Division 1
N-729-1	Alternative Examination Requirements for PWR Reactor Vessel Upper Heads with Nozzles Having Pressure-Retaining, Partial-Penetration Welds

05.02.01.02-3

05.02.01.02-3

05.02.01.02-4

NOTES:

1. See Section 3.8 for use.