Response to

Request for Additional Information No. 85 (1105), Revision 0

10/2/2008

U. S. EPR Standard Design Certification
AREVA NP Inc.
Docket No. 52-020
SRP Section: 14.02 - Initial Plant Test Program - Design Certification and New License Applicants
Application Section: SRP 14.2
CQVP Branch

Question 14.02-35:

The U.S. EPR FSAR Section 3.8.1.7.1, Structural Integrity Test (SIT) states that following construction, the Reactor Containment Building is proof-tested at 115 percent of the design pressure and that the SIT procedure complies with the requirements of Article CC-6000 of the ASME BPV Code, 2004 Edition, Section III, Division 2, and with Subsection IWL and IWE of Section XI of ASME BPV Code. The U.S. EPR FSAR, in Chapter 14.2.12.3.6, "Containment Integrated Leak Rate and Structural Integrity Tests," Section 5.0, "Acceptance Criteria," references Section 3.8.1 of the FSAR; however, the test abstract does not reference compliance with Article CC-6000. The NRC staff requests that AREVA revise the acceptance criteria of Section 14.2.12.3.6 to include a reference to CC-6000 of the ASME BPV Code and make a specific reference to FSAR Sections 3.8.1.7.1.

Response to Question 14.02-35:

U.S. EPR FSAR Tier 2, Section 14.2.12, Test #029 will be revised:

- Test pressure will be revised from 110% to 115% of design pressure to be consistent with U.S. EPR FSAR Tier 2, Section 3.8.1.7.1.
- Article CC-6000 of the ASME BPV Code will be referenced in the acceptance criteria.
- U.S. EPR FSAR Tier 2, Section 3.8.1.7.1 will be referenced in the acceptance criteria.

FSAR Impact:

U.S. EPR FSAR Tier 2, Section 14.2.12, Test #029 will be revised as described in the response and indicated on the enclosed markup.

Question 14.02-36:

SRP 14.2.I.3 states that a COL application referencing a DC must address COL action items. The U.S. EPR lists the COL information items in Table 1.8-2, "U.S. EPR Combined License Information Items," of the FSAR. Table 1.8-2 lists seven COL information items, however, Chapter 14.2 assigns the COL applicant responsibility for three additional information items. Specifically, Section 14.2.4, "Conduct of Test Program," Section 14.2.9, "Trial Use of Plant Operating and Emergency Procedures," and Table 14.2-1, "List of Initial Tests for the U.S. EPR," Test #43, "Raw Water Supply System." Accordingly, the NRC staff requests that AREVA revise Table 1.8-2 to address all information items assigned to the COL in Section 14.2 or justify their omission.

Response to Question 14.02-36:

A response to this question will be provided by January 15, 2009.

Question 14.02-37:

RG 1.68 Appendix A.1.f.(2) states that cooling towers and associated auxiliaries should be tested during the preoperational test phase. Section 14.2.12.21.6, "Cooling Tower Acceptance (Test #223)," is listed in the greater than or equal to 98 percent power ascension plateau of the power ascension phase of the initial test program. In addition, a prerequisite of the test is that plant output be at approximately full-power. The NRC staff requests that AREVA justify testing of the cooling towers during the power ascension test phase rather than during the preoperational testing phase as suggested in the RG.

Response to Question 14.02-37:

The safety-related ultimate heat sink cooling towers are tested during the preoperational test phase, as described in U.S. EPR FSAR Tier 2, Section 14.2.12, Test #049. The main cooling tower is tested with actual heat load, as described in U.S. EPR FSAR Tier 2, Section 14.2.12, Test #223. The design of the safety-related cooling tower is more rugged and less susceptible to spray pattern and fill performance than the main cooling tower; therefore, a preoperational test is appropriate. The main cooling tower is designed to optimize thermal performance and is best tested with significant circulating water heat load. The startup organization typically operates the circulating system at full flow to test the circulating pumps and the condenser backpressure, but the primary attribute for the cooling tower heat removal can only be tested with thermal load.

FSAR Impact:

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

Question 14.02-38:

Please verify that test abstract #225, "Potable and Sanitary Water System," actually belongs between test abstract #045 and #46 in the preoperational phase of Section 14.2.12 in the U.S. EPR FSAR.

Response to Question 14.02-38:

U.S. EPR FSAR Section 14.2.12, Test #225 is correctly located between Tests #045 and #046.

Test abstracts were assigned sequential test numbers during the development of U.S. EPR FSAR Tier 2, Section 14.2.12. Since these test numbers are referenced in other AREVA NP engineering documents, a test abstract maintains the same test number, even if new test abstracts are added or existing test abstracts are moved.

FSAR Impact:

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

U.S. EPR Final Safety Analysis Report Markups

5.1 Verify leak rates, when summed with the total of other Type B and C LRTs, do not exceed the allowable limits as required by the Technical Specifications and 10 CFR 50, Appendix J.

5.2 The CIVs operate as described in Section 3.1.5, Section 3.8.1, and Section 6.2.6.

14.2.12.3.6 Containment Integrated Leak Rate and Structural Integrity Tests (Test #029)

1.0 OBJECTIVE

1.1 To perform the structural integrity test (SIT) and integrated leak rate test (ILRT) for the containment.

1.2 To verify that the integrated leak rate from the containment does not exceed the maximum allowable leakage rate.

2.0 PREREQUISITES

2.1 Containment is functional and penetration local leak rate testing has been completed to the greatest extent possible.

2.2 All systems inside containment which have CIVs identified are vented and drained as required by Table 6.2.4-1—Containment Isolation Valve and Actuator Data.

2.3 Leakage rate determination instrumentation is available, calibrated, and is operating satisfactorily prior to performing the following test.

2.4 Containment inspection completed as required by the Technical Specifications and 10 CFR 50, Appendix J.

2.5 Systems required for the test are available, including station air and other miscellaneous systems.

2.6 Instrumentation to measure containment building movement is installed and calibrated and is operating satisfactorily prior to performing the following test.

2.7 Containment ventilation system fans are capable of running for air circulation. Note that it is necessary to create air circulation to eliminate local temperature variations that would bias the test results.

3.0 TEST METHOD

3.1 Close individual CIVs by the means provided for normal operation of the valves as required by ~~the Technical Specifications or~~ 10 CFR 50, Appendix J.

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3.2 Increase the internal pressure in the containment building from atmospheric pressure to a minimum of ~~1.10 times the design basis accident pressure~~ 115% of design pressure in at least four approximately equal increments and depressurized in the same increments.

3.3 Record data at each pressure level, during pressurization and depressurization, an evaluation of the deflections shall be made to determine if the response deviates significantly from the expected response.

3.4 Perform a visual inspection of the containment hatches, penetrations, and flanged joints.

3.5 Determine the containment leak rate at calculated peak accident pressure and at one-half calculated peak accident pressure.

3.6 Verify leakage by reference vessel method, absolute pressure method, or both.

3.7 Verify the test accuracy by supplementary means.

4.0 DATA REQUIRED

4.1 Structural integrity data.

4.1.1 The readings of instrumentation to measure containment building movement shall be recorded at selected pressure levels.

4.1.2 Displacements shall be measured at several points along locations spaced evenly around the containment. The locations shall include the following:

- Springline.
- Top of dome (the top of the concrete).
- Locations with varying stiffness characteristics such as major penetrations.
- Radial and vertical defections of the containment wall adjacent to the equipment hatch opening shall be measured at twelve points around the hatch penetration. The twelve points shall be three locations each at the three, six, nine and twelve o'clock positions around the penetration.

4.2 Integrated leak rate data.

4.2.1 Containment temperature, pressure, and humidity.

4.2.2 Reference vessel temperature and pressure.

4.2.3 Atmospheric pressure and temperature.

4.2.4 Known leakage air flow.

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5.0 ACCEPTANCE CRITERIA

5.1 SIT results are satisfactory, in accordance with ASME BPV Code, Article CC-6000, as detailed in ~~Section 3.8.1~~Section 3.8.1.7.1.