Draft

Request for Additional Information No. 143 (1386), Revision 0

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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

QUESTIONS for Quality and Vendor Branch 1 (AP1000/EPR Projects) (CQVP)

14.02-61

Section 14.2.12.10.7, "Security Lighting (Test #114)," references Section 13.6, "Security," for the system description to designate the acceptance criteria for the test. However, Section 13.6 states that a COL applicant that references the U.S. EPR design certification will provide a Physical Security Plan and supporting documents which includes design features such as ensuring that exterior areas within the protected area are illuminated to levels necessary to permit observation and detection. Since the security lighting description is a COL action item that will be addressed through the physical security plan (Safeguards Information), the staff requests that AREVA remove Section 14.2.12.10.7, "Security Lighting (Test #114)" from Section 14.2 of the U.S. EPR FSAR.

14.02-62

Regulatory Guide (RG) 1.68, Appendix A.1.b(1), "Control Rod System Tests," states that the preoperational testing should demonstrate the proper operation of control rod system functions such as control rod withdrawal inhibit features, runback features, rod withdrawal sequence control devices, and rod worth minimizers. Additionally, RG 1.68, Appendix A.1.b(1) states that the tests should demonstrate the proper interaction of the control rod drive system with other systems and design features, such as automatic reactor power control systems and refueling equipment. The U.S. EPR FSAR Section 14.2.12.3.13, "Control Rod Drive Mechanism Control (Test #036)," and Section 14.2.12.13.9, "Pre-Core Control Rod Drive Mechanism Performance (Test #169)," do not include testing of the above listed features of the Control Rod Drive Mechanism. The staff requests that AREVA revise Tests #036 and #169 to include demonstration of control rod withdrawal inhibit features, runback features, rod withdrawal sequence control devices, rod worth minimizers, and proper interaction of the control rod drive system with other systems and design features, or justify the exclusion of these design features.

14.02-63

RG 1.68, Appendix A.2, "Initial Fuel Loading and Precritical Tests," addresses the tests that are required to be completed for fuel loading and prior to initial criticality and states

that final functional testing of the reactor protection system to demonstrate proper trip points, logic, and operability of scram breakers and valves, as well as demonstration of the operability of manual scram functions should be tested. U.S. EPR FSAR Section 14.2.12.14, “Phase II: Initial Fuel Loading and Precritical Tests,” describes the testing to be completed during the initial fuel load and prior to initial criticality, however, the tests to not include the final functional testing of the reactor protection system. Therefore, the staff requests that AREVA review and revise the test abstracts in Section 14.2.12.14 of the FSAR to resolve this inconsistency.

14.02-64

Regulatory Guide 1.68 Appedix A.1(3) states that for vibration tests Regulatory Guide (RG)1.20, "Comprehensive Vibration Assessment Program for Reactor Internals During Preoperational and Initial Startup Testing," should be used as guidance. However, Table 1.9-2, "U.S. EPR Conformance with Regulatory Guides," states that the U.S. EPR FSAR takes exception to RG 1.20 for Sections 14.2.12, "Individual Test Descriptions," of the startup testing. The staff requests that AREVA revise Table 1.9-2 to include use of RG 1.20 during startup vibration tests or provide justification for the exception to RG 1.20.

14.02-65

In response to RAI 14.02-09, AREVA stated that the U.S. EPR standard design includes locations for toxic gas monitors as conceptual information, thus RG 1.78, "Evaluating the Habitability of a Nuclear Power Plant Control Room during a Postulated Hazardous Chemical Release," is not applicable to U.S. EPR FSAR, Tier 2, Section 14.2, "Initial Plant Test Program." However, SRP 14.2 states that control room habitability system testing should include demonstration of the proper operation of toxic chemical detection systems. In addition, Section 14.2.12.8.10, "Main Control Room Air Conditioning System (Test #082)," includes testing of toxic chemical detection, if applicable. Since Test #082 includes testing the toxic chemical detection system, the test should be conducted in conformance with the guidance in RG 1.78. The staff requests that AREVA revise Section 14.2.7, "Conformance of Test Program with Regulatory Guides," and Table 1.9-2, “U.S. EPR Conformance with Regulatory Guides,” of the U.S. EPR FSAR to state that RG 1.78 is applicable to the testing conducted in Section 14.2 of the U.S. FSAR.

14.02-66

RG 1.68, Appendix A.4, "Low-Power Testing," describes the tests that applicants should conduct following criticality, normally while the plant is at less than 5% power. Appendix A.4.u. of RG 1.68 further states that during low-power testing, the applicant should demonstrate the operability of major or principal plant control systems. Section

14.2.12.18.1, "Control Systems Checkout (Test #199)," demonstrates the operability of the plant automatic control systems, however, it is conducted during Power Ascension Testing at 30%, 50%, 75% and greater than or equal to 98% reactor power. The staff requests the Areva include testing of automatic control systems during low-power testing (less than 5% reactor power) as described in RG 1.68 Appendix A.4.u or justify its exclusion from the initial test program.

14.02-67

RG 1.68, Appendix A.5, "Power-Ascension Tests," describes initial plant testing to be completed at the 25%, 50%, 75%, and 100% reactor power plateaus. However, initial testing in Phase IV: Power Ascension Tests of the U.S. EPR FSAR requires the power ascension tests to be completed at 30%, 50%, 75%, and greater than or equal to 98% reactor power. The staff requests that AREVA justify testing of systems during the Power Ascension Phase at reactor power levels different than those required in RG 1.68.

14.02-68

The U.S. EPR FSAR Section 14.2.12.12.7, "Radiation Monitoring (Test #143)," states that all area and airborne radiation monitors have to meet the criteria in Chapter 7 of the FSAR. However, in addition to Chapter 7 of the FSAR, all radiation monitors should meet the applicable criteria in Section 12.3.4, "Radiation Monitors," of Chapter 12 in order to meet the requirements of 10 CFR 20.1701, 10 CFR 20.1502, and RG 1.68. The staff requests that AREVA revise Test #143 to include Section 12.3.4 in the acceptance criteria for this test or provide an equivalent description of the requirements in the test abstract.

14.02-69

The U.S. EPR FSAR Section 14.2.12.12.7, Radiation Monitoring (Test #143) states that the self testing feature of the radiation monitor will be checked. The staff request AREVA provide more detail as to the function of the self testing feature, as well as how it ensures that the monitor meets the acceptance criteria in Chapter 7 and 12 of the U.S. EPR FSAR.

14.02-70

Regulatory Guide 1.68, Appendix A, Part j, Instrumentation and Control Systems, lists instrumentation and control systems that should be included in the test program. In addition, RG 1.68 states that “some of these tests can be conducted in conjunction with the appropriate system-level tests.” The U.S. EPR FSAR Section 14.2.12.12.2, "Accident Monitoring (Test #138)," and Section 14.2.12.12.19, "Post Accident Monitoring Instrumentation (Test #155)," describe the initial tests which will be used to verify the performance of accident and PAM radiation monitors. However, any radiation monitor which undergoes accident or PAM instrumentation tests should also complete the system testing described in Section 14.2.12.12.7, "Radiation Monitoring (Test #143)." The staff requests that AREVA modify the test abstracts in Tests #138 and #155 to

establish clear requirements that all accident and PAM radiation monitors will also complete the testing described in Test #143.

14.02-71

In Question 14.02-18, the staff requested, in Sections 14.2.12.11, " I&C Plant Systems," and 14.2.12.12, "I&C Safety Systems of the FSAR, that the applicant provide the test acceptance criteria, verification of redundancy and electrical independence to the abstracts consistent to the guidance of Appendix A.1.j of RG 1.68. In "Response to Request for Additional Information No. 46 Supplement 1, Revision 0," the applicant revised the test abstracts in Sections 14.2.12.11 and 14.2.12.12, however, AREVA removed the references to the Chapters in which the design requirements reside in the acceptance criteria of the abstracts. The staff requests that AREVA revise Section 14.2.12 to re-establish the acceptance criteria that reference the applicable system/component FSAR chapters.