

Request for Additional Information No. 127 (1250, 1278), Revision 0

11/12/2008

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

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

14.02-52

Sections 14.2.12.1.2 through 14.2.12.1.11, of the U.S. EPR FSAR state, under prerequisites, that support systems required for operation will be completed and functional before testing, however it is not stated how these support systems are tested before AREVA considers them functional. Also, it is stated that the alarms and interlocks are observed, however, the FSAR does not state that the automatic actions of the alarms and interlocks are to be verified. The staff requests that AREVA revise these FSAR sections to clarify how the support systems will be considered functional and how the automatic actions of the alarms and interlock will be verified.

14.02-53

Section 14.2.12.1.3, "CVCS Charging and Seal Injection (Test #003)," of the U.S. EPR FSAR, verifies the proper performance of the CVCS charging subsystem. However, the test does not address verification that the seal injection subsystem is operational, including verification of operation of the seal injection filters and the differential pressure alarm. The staff requests that AREVA revise Test #003 accordingly.

14.02-54

U.S. EPR FSAR Section 14.2.12.13.6, "Pre-Core Primary and Secondary Chemistry Data (Test #166)," acceptance criteria states that the RCS and SG water chemistry can be maintained as described in Section 5.4.2 and the AREVA Chemistry Manual. However, Sections 5.4.2.5.2.7, "Secondary Side Water Chemistry," and 5.4.2.5.2.8, "Primary Side Water Chemistry," do not discuss the use of the AREVA Chemistry Manual to control Primary or Secondary water chemistry.

The staff requests that AREVA clarify the specific use of the AREVA Chemistry Manual, clarify whether the AREVA Chemistry Manual adheres to EPRI Report No. 1002884, "PWR Primary Water Chemistry Guidelines," Revision 5, and EPRI Report No. 1008224, "Pressurized Water Reactor Secondary Water Chemistry Guidelines," Revision 6, and revise the applicable FSAR sections and test abstracts.

14.02-55

The U.S. EPR FSAR Section 14.2.12.5.7, "Essential Service Water System (Test #048)," describes the initial test program for the ESWS. Item 4.5 of the "Data Required," section

of the ESWS test abstract requires that the test record component cooling water heat exchanger ESWS flow with different pump combinations. However, different pump combinations are not applicable for ESWS testing because only one pump is provided per train and the four trains are fully independent. Therefore, the staff requests that AREVA revise the ESWS test (Test #48) in the FSAR to resolve this inconsistency, or justify testing the system in this manner.

14.02-56

The U.S. EPR FSAR Section 14.2.12.5.7, "Essential Service Water System (Test #048)," describes the initial test program for the ESWS. The results of the ESWS test are considered to be acceptable if the ESWS performs as described in the FSAR Section 9.2.1. However, the staff has requested additional information (Questions 9.2.1-04 through -08), concerning the design bases for the ESWS in FSAR Section 9.2.1. Consequently, until the ESWS design basis is adequately described, the acceptance criteria for the ESWS test program cannot be established. The staff requests that AREVA provide additional information in FSAR Section 9.2.1 to adequately describe the ESWS design basis and revise the acceptance criteria for the ESWS initial test abstract as appropriate.

14.02-57

SRP 14.2.II.3.C. states that the applicant should include general guidance about how, and to what extent, the test program will use and/or test plant operating, emergency, and surveillance procedures. In addition, Section 14.2.II.3.H.i of the SRP states that the applicant should incorporate, to the extent practicable, the plant operating, emergency, and surveillance procedures into the test program or should otherwise verify these procedures through use during the test program. Further, RG 1.68 Section C.7 states that plant operating and emergency procedures should be trial-tested and corrected during the test program prior to fuel loading to establish their accuracy. However, the U.S. EPR FSAR Section 14.2.9 only gives guidance in reference to operating and emergency procedures for trial use, only states that emergency procedures will be performed on the plant simulator for procedure validation, and does not provide guidance for correction of operating and emergency procedures after trial-testing.

The staff requests AREVA revise Section 14.2.8 of the FSAR to: (1) include guidance on use of surveillance procedures during the initial test program; (2) include guidance on the incorporation of operating and surveillance procedures in to the test program for verification; and, (3) provide for correction of operating and emergency procedures after trial-testing.

14.02-58

Section 14.2.II.3.H.i of the SRP states that the applicant should incorporate, to the extent practicable, the plant operating, emergency, and surveillance procedures into the test program or should otherwise verify these procedures through use during the test program. In addition, Section 14.2.II.3.H.ii of the SRP states that the applicant should provide additional operator training and participation based on the performance and evaluation of the test results of certain initial tests [such as those discussed in SRP Section 14.2.II.3.H.i]. An acceptable program will satisfy the criteria described in Three Mile Island (TMI) Action Plan Item I.G.1 of NUREG-0660 and NUREG-0737.

The TMI Action Plan Item I.G.1 calls for a new licensee to conduct a set of low power tests to achieve the objectives of Task I.G, "Pre-operational and Low Power Testing." The objective of Task I.G.1 is to increase the capability of shift crews to operate facilities in a safe and competent manner by assuring that the training for plant changes and off normal events is conducted. Near-term operating license facilities are required to develop and implement intensified training exercises during the low-power testing programs. The training programs are to provide "hands on" training for plant evaluation and off-normal events for each operating shift.

Section 14.2.9 of the U.S. EPR FSAR states that to accomplish these requirements, the emergency operating procedures will be performed on the plant simulator for operator training. The staff requests that AREVA revise Section 14.2.9 to include the performance of operator training for all procedures which include plant changes (such as operating and surveillance) and off normal events in addition to emergency procedures consistent with the objective of Task I.G.1.

14.02-59

Section 14.2.II.3.H.i of the SRP states that the applicant should incorporate, to the extent practicable, the plant operating, emergency, and surveillance procedures into the test program or should otherwise verify these procedures through use during the test program. In addition, Section 14.2.II.3.H.ii of the SRP states that the applicant should provide additional operator training and participation based on the performance and evaluation of the test results of certain initial tests (such as those discussed in SRP Section 14.2.II.3.H.i). An acceptable program will satisfy the criteria described in Three Mile Island (TMI) Action Plan Item I.G.1 of NUREG-0660 and NUREG-0737.

TMI Action Plan Item I.G.1 calls for a new licensee to conduct a set of low power tests to achieve the objectives of Task I.G, "Pre-operational and Low Power Testing." The objective of Task I.G.1 is to increase the capability of shift crews to operate facilities in a safe and competent manner by assuring that the training for plant changes and off-normal events is conducted. Near-term operating license facilities are required to develop and implement intensified training exercises during the low-power testing programs. The training programs are to provide "hands-on" training for plant changes and off-normal events for each operating shift. This should be accomplished by incorporating the plant change and off-normal procedures (such as operating, surveillance, and emergency procedures), to the extent practical, into the initial test program procedures and by providing additional operator training and participation based on the performance and evaluation of the test results of certain initial tests.

Contrary to the above guidance, Section 14.2.9 of the U.S. EPR FSAR does not provide for operator training and participation during the low-power testing phase through incorporation of plant change and off-normal procedures into the initial test procedures, but only provides for operating training on the plant simulator and only for emergency procedures to satisfy the criteria in the TMI Action Item I.G.1.

Should it prove impractical to incorporate certain plant change or off-normal procedures into the procedures of the initial test program and the applicant chooses to fulfill criteria of TMI Action Item I.G.1 by testing those procedures on the plant simulator, AREVA should justify the use of the simulator by demonstrating that the simulator is a plant-referenced simulator as defined in 10 CFR Part 55, and that it tracks real plant behavior by comparing the simulator responses with test data from a U.S. EPR plant which has already performed the tests.

Therefore, the staff requests that AREVA revise Section 14.2.9 of the U.S. EPR to include provisions for “hands-on” operator training and participation in the low power testing phase or justify the use of the simulator as described above.

14.02-60

Section 14.2.II.3.H.i of the SRP states that the applicant should incorporate, to the extent practicable, the plant operating, emergency, and surveillance procedures into the test program or should otherwise verify these procedures through use during the test program. RG 1.68 Section B states that the applicant should verify by trial use, to the extent practical, that the facility operating procedures and emergency procedures are adequate and RG 1.68 further states in Section C.7 that plant operating and emergency procedures should, to the extent practical, be developed, trial-tested, and corrected during the ITP prior to fuel loading to establish their adequacy.

Plant operating, emergency, and surveillance procedures should be use-tested during the test program and used in the development of preoperational and initial startup procedures to the extent practicable. This can be accomplished through incorporating the plant operating, emergency, and surveillance procedures by reference or by extraction of applicable sections, or by another method suggested by the applicant with justification. This process allows the applicant to verify by trial use, to the extent practical, the adequacy of the plant operating procedures, surveillance procedures and emergency procedures under actual or simulated conditions prior to initial fuel load. Any procedures which are found to be unable to be implemented during the initial test program should be corrected as appropriate, based on initial testing, operating experience and comparison with the as-built systems prior to fuel loading.

Contrary to the guidance above, the FSAR does not provide for the inclusion of the plant operating, surveillance, or emergency procedures into the test procedures of the initial test program and does not provide a schedule to allow for the correction the the operating or emergency procedures during the initial test program prior to fuel loading. Instead, Section 14.2.9 of the U.S. EPR FSAR states that to accomplish these requirements, the emergency operating procedures will be performed on the plant simulator for procedure validation.

Should it prove impractical to incorporate certain plant operating, surveillance, or emergency procedures into the procedures of the initial test program and the applicant chooses to test those procedures on the plant simulator, it should be demonstrated that the simulator to be used for this purpose is a plant-referenced simulator as defined in 10 CFR Part 55 and that it tracks real plant behavior by comparing the simulator responses with test data from a U.S. EPR plant which has already performed the tests.

Therefore, the staff requests that AREVA revise Section 14.2.9 to: (1) provide for the incorporation, to the extent practicable, of the plant operating, emergency, and surveillance procedures into the procedures of the initial test program or justify the use of the simulator for procedure validation in lieu of inclusion of the plant procedures into the test procedures; and, (2) provide for a schedule to allow for the correction of the operating and emergency procedures during the initial test program prior to fuel loading.