



10 CFR 52.45  
10 CFR 2.390

December 11, 2007  
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U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555-0001

**Application for Standard Design Certification of the U.S. EPR (Project No. 733)**

- Ref.: 1. Letter, Ronnie L. Gardner (AREVA NP Inc.) to Document Control Desk (NRC), "Request for Two Exemptions for the U.S. EPR Standard Design Certification (Project No. 733)," NRC:07:075, December 11, 2007.
- Ref.: 2. Letter, Ronnie L. Gardner (AREVA NP Inc.) to Document Control Desk (NRC), "10 CFR 50.55a Exemption Request for the U.S. EPR Standard Design Certification (Project No. 733)," NRC:07:076, December 11, 2007.
- Ref.: 3. Letter, Getachew Tesfaye (NRC) to Ronnie L. Gardner (AREVA NP Inc.), "NRC Audit Report for the AREVA NP Inc. (AREVA) Evolutionary Pressurized Reactor (EPR) Design Certification Application Review," December 3, 2007.

AREVA NP Inc. (AREVA NP) is pleased to tender its application for a Standard Design Certification of the U.S. EPR in accordance with Subpart B of 10 CFR Part 52. The contents of the application conform to the requirements specified in 10 CFR 52.46 and 10 CFR 52.47.

The application consists of the following items, each enclosed on a separate DVD or CD:

1. U.S. EPR Final Safety Analysis Report (pursuant to 10 CFR 52.47) including Sensitive Unclassified Non-Safeguards Information (SUNSI), to be withheld under 10 CFR 2.390
2. U.S. EPR Final Safety Analysis Report (pursuant to 10 CFR 52.47) in which the SUNSI material is redacted, termed the "Public Version"
3. Applicant's Environmental Report – Standard Design Certification (pursuant to 10 CFR 52.47(b)(2) and 10 CFR 51.55)

The U.S. EPR Final Safety Analysis Report was prepared following the guidance of NUREG-0800 and, to the extent applicable for design certification, using Regulatory Guide 1.206 as a guide for format and content.

In accordance with the terminology incorporated in the August 2007 amendment to 10 CFR 52.47(a), the design certification information, consisting of an introduction, Tier 1, and Tier 2, is termed a Final Safety Analysis Report (FSAR). Based on discussions with the NRC staff, this

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term is used by AREVA NP synonymously with a term used in previous design certifications, "Design Control Document" (DCD). AREVA NP considers this to be only a point of nomenclature to conform to the August 2007 amendment to 10 CFR 52.47(a). NRC positions, guidance, or other regulatory documents which refer to a Design Control Document have been used by AREVA NP as if equally applicable to an FSAR pursuant to 10 CFR 52.47(a) as amended.

Consistent with the position outlined in SECY-90-377, "Requirements for Design Certification Under 10 CFR Part 52," the material in the U.S. EPR FSAR is partitioned into two tiers of information. Tier 1 consists of material submitted for certification by rulemaking, including the inspections, tests, analyses, and acceptance criteria (ITAAC) required by 10 CFR 52.47(b)(1). Tier 2 consists of material submitted for approval as an acceptable means of implementation of Tier 1 criteria, including the information required by 10 CFR 52.47(a).

AREVA NP considers the U.S. EPR design to be an evolution of light-water reactor designs of plants that have been licensed and in commercial operation before April 18, 1989, in accordance with 10 CFR 52.47(c)(1). Therefore, the application provides an essentially complete nuclear power plant design except for site-specific elements such as the service water intake structure.

As discussed with the NRC staff during the pre-application readiness review audit, since AREVA NP believes that the designation of Tier 2\* material is subject to determination by the NRC, Revision 0 of the U.S. EPR FSAR does not contain designations for Tier 2\* material. AREVA NP intends to cooperate with the NRC in designating appropriate material as Tier 2\* during the review of the U.S. EPR FSAR and revise the document accordingly prior to the issuance of the design certification rule.

Under separate cover AREVA NP has submitted three requests for exemption supporting the application for design certification of the U.S. EPR (References 1 and 2). AREVA NP requests approval of each of these three exemptions concurrent with the approval of the application for design certification.

The seven "Audit Response Request" (ARR) items identified by the NRC staff in the pre-application readiness review audit report (Reference 3) are addressed within the U.S. EPR FSAR. Attachment A provides a summary of the responses to the ARR items.

Based on discussions with the NRC staff, AREVA NP understands that the comprehensiveness of the application review schedule would be enhanced if information is provided regarding the availability of material to address design process and verification ITAAC [termed "design ITAAC" or design acceptance criteria (DAC)] during the review of the design certification application. Therefore, AREVA NP intends to provide a proposed schedule for addressing design ITAAC (or DAC) to the NRC during the acceptance review period.

AREVA NP recognizes that the tendering of the application at this time of year has the potential for the disruption of plans for the personnel of both the Nuclear Regulatory Commission and AREVA NP. Therefore, AREVA NP acknowledges that the 60 day acceptance review period for the application will not begin in earnest until January 2, 2008. This is seen by AREVA NP to be mutually beneficial to both parties.

AREVA NP looks forward to interactions with the NRC to ensure an efficient and successful design certification review. I will be the AREVA NP point of contact for the U.S. EPR design certification review. I can be reached by telephone at 434-832-2369 or by e-mail at [sandra.sloan@areva.com](mailto:sandra.sloan@areva.com).

Sincerely,



Sandra M. Sloan, Manager of Regulatory Affairs  
New Plants Deployment  
AREVA NP Inc.

Enclosures

cc: L. Burkhart  
G. Tesfaye  
Project 733

## Attachment A

### Response to Audit Response Requests (ARR)

#### ARR-001:

*Sections 6.2 and 6.3 of the draft FSAR did not include the In-containment Refueling Water Storage Tank (IRWST) temperature vs. time evaluation. This evaluation is required by RG 1.206 since the IRWST water is injected into the reactor coolant system (RCS) as part of the emergency core cooling system (ECCS) in the event of a large break loss of coolant accident (LOCA).*

#### Response to ARR-001:

Tier 2 Section 6.2.1.3 has been revised to include additional details about the IRWST to address this ARR. IRWST temperature versus time is presented in Figure 6.3-7.

#### ARR-002:

*Section C.1.8.3.1.1 of RG 1.206, "AC Power Systems Description" states that "... descriptive information should include functional logic diagrams, electrical single-line diagrams, tables, physical arrangement drawings, and electrical schematics, describing the design of the electrical distribution systems, including grounding and lightning protection plan drawings." The draft FSAR did not contain the functional logic diagrams, physical arrangement drawings, electrical schematics, and lightning protection plan drawings.*

#### Response to ARR-002:

In Tier 2 Section 8.3.1.1.5, a reference to Figure 7.3-23 for EDG functional logic was added to address the functional logic aspect of the comment.

In Tier 2 Section 8.3.1.1.7, a reference to Section 3.8 for location of the general arrangement drawings to satisfy the physical arrangement drawing aspect was added. The general arrangement drawings identify the rooms the electrical equipment is located, but not the specific layout of the equipment. This shows separation, since the equipment is located in different buildings.

Surge arrestors for lightning and surge protection were added to Figures 8.3-2 and 8.3-3, referenced in Tier 2 Section 8.3.1.3.5.

With regard to electrical schematics, AREVA NP has followed the precedent regarding level of detail in previous design certification applications necessary to support a safety evaluation.

**ARR-003:**

*Section C.I.8.3.1.1 (4) of RG 1.206, "System Capacity and Capability" states that "...[t]he applicant should describe how the onsite power system satisfies the requirements of GDC 18 and the guidance in RGs 1.9 and 1.118 and describe the design's built-in capability to permit integral testing of onsite power systems on a periodic basis when the reactor is in operation." The draft FSAR states that the system has this capability but does not describe how or what those specific capabilities are. The FSAR needs to include the appropriate level of detail to describe the specific capabilities or how the design permits integral testing of the onsite power systems on a periodic basis when the reactor is in operation.*

**Response to ARR-003:**

Tier 2 Section 8.3.1.1.5 has a discussion of EDG testing to satisfy the RG 1.9 portion of this comment.

Information is included in Tier 2 Section 8.3.1.3.7 regarding testing including circuit breakers and MCC motor starters, protective relays, specific testing which is only performed when shutdown, and reference to where the battery and battery charger testing is described.

In Tier 2 Section 8.3.1.2.5, reference to surveillance testing of Class 1E systems and components is provided.

**ARR-004:**

*Section C.I.8.3.1.3 of RG 1.206, "Power Quality Limits" indicates the need for "...analyses and any underlying assumptions used to demonstrate the acceptance criteria for the digital control and protection systems, including protective devices for motors and generators." The draft FSAR does not include the analyses and underlying assumptions used to demonstrate the acceptance criteria for digital control and protection systems including protective devices for generators.*

**Response to ARR-004:**

A statement is provided in Tier 2 Section 8.3.1.3.6 to indicate that protective device application is consistent with the power quality required for the device to operate. This is based on AREVA's understanding that the intent of the comment is to acknowledge that digital based protection systems can be susceptible to poor power quality, and that such conditions will be considered in the use of these devices.

Tier 2 Section 8.3.2.3.5 was revised to include a description of the design elements that provide adequate power quality to the I&C systems.

**ARR-005:**

*Section C.I.9.2.5 of RG 1.206, "Ultimate Heat Sink [UHS]" identifies several items that need to be included in the FSAR to meet the regulations, including design bases information, system description, safety evaluation, inspection and testing requirements, and instrumentation requirements. The draft FSAR does not contain the format and content described in the RG. The staff understands that AREVA is still evaluating whether to include the UHS in the scope of*

*the design certificate application or not. AREVA needs to determine whether the UHS is within scope of the DC or not and modify the FSAR appropriately.*

**Response to ARR-005:**

Tier 2 Section 9.2.5 was added to address this ARR.

**ARR-006:**

*Section C.I.14.2.2 of RG 1.206, "Organization and Staffing" indicates the need for inclusion of a description of organizational authorities and responsibilities including staff participation in each major test phase of the program, and experience and qualification of supervisory personnel responsible for managing, developing, or conducting the program. An overall discussion regarding organizational and staffing responsibilities was not included in the draft FSAR.*

*Section C.I.14.2.9 of RG 1.206, "Trial Use of Plant Operating and Emergency Procedures" states that "[the FSAR] should identify the specific operator training to be conducted as part of the use-testing during the special low-power testing program related to the resolution of TMI Action Plan Item I.G.1, as described in ... NUREG-0660 ... NUREG-0694 ... NUREG-0737 ..." This discussion was not included in the draft FSAR.*

*Section C.I.14.2.11 of RG 1.206, "Test Program Schedule" states that the FSAR "should consider the following five guidance components for test program scheduling and sequencing: (1) The applicant should allow at least 9 months to conduct preoperational testing. (2) The applicant should allow at least 3 months to conduct startup testing, including fuel loading, low-power tests, and power-ascension tests. (3) Overlapping test program schedules (for multiunit sites) should not result in significant divisions of responsibilities or dilutions of the staff provided to implement the test program. (4) The sequential schedule for individual startup tests should establish, insofar as practicable, that test requirements should be completed prior to exceeding 25-percent power for all plant SSCs that are relied upon to prevent, limit, or mitigate the consequences of postulated accidents. The schedule should establish that, insofar as practicable, testing is accomplished as early in the test program as feasible and that the safety of the plant not be entirely dependent on the performance of untested systems, components, or features. (5) Approved test procedures should be in a form suitable for review by regulatory inspectors at least 60 days prior to their intended use or at least 60 days prior to fuel loading for fuel loading and startup test procedures. Licensees should provide timely notification to the NRC of changes in approved test procedures that have been made available for NRC review. An overall discussion regarding this matter was not included in the draft FSAR.*

**Response to ARR-006:**

Tier 2 Section 14.2.2, 14.2.9 and 14.2.11 were modified to address this ARR.

The startup schedule is provided in Tier 2 Figure 14.2.11-1—U.S. EPR Commissioning Milestones.

**ARR-007:**

*10 CFR 52.47(b)(1) requires that an application for design certification must contain proposed inspections, tests, analyses, and acceptance criteria (ITAAC). ITAAC was not included for the turbine building and the access building in the draft application package. At the time of the audit,*

*AREVA was evaluating whether the turbine building was within the scope of the design certification. AREVA needs to determine whether the turbine building is within scope of the DC or not and modify the application package appropriately. AREVA had also agreed that an ITAAC for the access building should be provided.*

**Response to ARR-007:**

The turbine building is not within the scope of the U.S. EPR design certification. Both the turbine and access buildings have ITAAC in Section 4 of the Tier 1 material.