November 12, 2009

Mrs. Sandra Sloan
AREVA NP Inc.
3315 Old Forest Road
P.O. Box 10935
Lynchburg, VA 24506-0935

SUBJECT: AUDIT REPORT FOR SEPTEMBER 17, 2009 AUDIT TO REVIEW SELECTED AREAS RELATED TO U.S. EPR FSAR CHAPTER 4.4 SAFETY EVALUATION

Dear Mrs. Sloan:

AREVA NP, Inc., has submitted by a letter dated December 11, 2007, to the U.S. Nuclear Regulatory Commission (NRC) a Final Safety Analysis Report (FSAR) for its application of the U.S. EPR design, accessible by Agencywide Documents Access and Management System (ADAMS) Accession No. ML073520305. NRC staff initiated the design certification review on March 19, 2008. In addition, technical and topical reports related to Chapter 4 have been submitted for review, including ANP-10282P, "POWERTRAX/E Online Core Monitoring Software for the U.S. EPR Technical Report" (ADAMS ML073410590), ANP-10287P, "Incore Trip Setpoint and Transient Methodology for the U.S. EPR Topical Report" (ADAMS ML073410589), and ANP-10285P, "US EPR Fuel Assembly Mechanical Topical Report" (ADAMS ML072840177).

The staff review of Chapter 4 of the U.S. EPR design certification application and ANP-10287P identified the need for additional information to cover important review areas handled by the NRO Reactor Systems, Code Review and Performance Branch (SRSB). In order to address these concerns, the staff held an audit that at the AREVA office in Rockville, MD on September 17, 2009. The review of additional technical documents was facilitated by the presence of AREVA personnel at the audit. The audit report is contained in the enclosure to this letter. If you have any questions regarding this matter, I may be reached at 301-415-3361.

Sincerely,

/RA/

Getachew Tesfaye, Sr., Project Manager
EPR Projects Branch
Division of New Reactor Licensing
Office of New Reactors

Docket No. 52-020

Enclosure:
Audit Report
cc: DC AREVA – EPR Mailing List

Mrs. Sandra Sloan
AREVA NP Inc.
3315 Old Forest Road
P.O. Box 10935
Lynchburg, VA 24506-0935

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DATE	09/22/09	09/28/09	10/21/09	11/12/09

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APPLICANT: AREVA NP, INC.

PROJECT: EPR DESIGN CERTIFICATION

SUBJECT: AUDIT REPORT FOR SEPTEMBER 17, 2009 AUDIT TO REVIEW SELECTED AREAS RELATED TO U.S. EPR FSAR CHAPTER 4.4 SAFETY EVALUATION

BACKGROUND

AREVA NP, Inc. (AREVA), submitted to the U.S. Nuclear Regulatory Commission (NRC) a Final Safety Analysis Report (FSAR) for its application of the U.S. Evolutionary Power Reactor (EPR) in December, 2007. NRC staff initiated the design certification review on March 19, 2008. In addition, topical reports related to FSAR Chapter 4 (ANP-10285P and ANP-10287P) have been submitted for review. In order to cover important review areas handled by the NRO Reactor System Branch, the staff held an audit on September 17, 2009, at the local AREVA's office in Rockville. The audit areas were discussed with AREVA on Thursday, September 10, 2009. A final audit plan was provided to AREVA on September 16, 2009. During the audit, the agenda was slightly modified to accommodate efficient use of time and resources. The agenda of the audit as practiced is contained in Attachment A. The review of the additional technical documents, made available by AREVA at its local office, was facilitated by AREVA's personnel being present at the audit. The audit was necessary to resolve existing open questions in accomplishing the U.S. FSAR review schedule in an efficient manner.

AUDIT APPROACH

The purpose of this audit was to review additional documents provided by AREVA that pertain to the FSAR safety evaluation related to the design, function, maintenance, and operability of self powered neutron detectors (SPNDs). The specific issues of concern were that sufficient detailed information on the SPND had not been provided to perform an adequate safety evaluation. The staff audited documents related to the design, fabrication, characteristics, and function of the SPNDs planned for use in the U.S. EPR design.

To achieve the review goals in an efficient manner, the staff assembled an interdisciplinary audit team consisting of professionals with expertise in the relevant technical areas. The audit team included experts from NRC and consulting organizations. To facilitate and expedite the work, representatives from AREVA were present to introduce the audit topics along with the supporting documentation and technical evidence. This report documents the results of the audit.

SUMMARY OF TOPICS DISCUSSED

The SPND audit began at 8:00 a.m. at the AREVA Twinbrook Office in Rockville, MD. The list of attendees from NRC and AREVA are given in Attachment B. NRC staff gave a brief introduction on the topics that were to be discussed, including the design, fabrication, performance, function, and uncertainty of the SPNDs that will be used in the U.S. EPR design.

AREVA personnel presented an overview of the technical information contained in the provided audit documentation. The presentation covered the design and fabrication of the SPNDs, overall descriptions of nuclear instrumentation systems used in operating plants, material selection for the SPNDs for the U.S. EPR design, and a summary of operational experience with

the SPNDs to be used in the U.S. EPR design. AREVA personnel also clarified questions concerning whether or not the SPNDs were calibrated in a laboratory environment prior to operational use. The presentation was a general overview of the information provided to NRC in the audit documentation.

After the conclusion of the presentation, AREVA personnel answered questions from NRC staff regarding the SPNDs. The need for additional testing was identified during the course of this audit, and a request for additional information (RAI) has been issued as a result of this audit in Chapter 4 in order to address staff concerns regarding verification of the algorithms and processes employed in the use of SPNDs. Other questions on dead-time correction, sensitivity to different sources of noise, and proximity to margin were deferred to the documentation review portion of the meeting as these questions required review of detailed technical documents. The question and answer session concluded the presentation portion of the audit.

At 9:00 a.m., NRC staff began the documentation review session of the audit. A list of the audited documents provided to NRC staff is given in Attachment C. AREVA technical personnel remained available to answer questions as necessary during the documentation review session. Several clarifications were required during the audit of the available documentation. The review of the documentation identified the need for further RAIs in order to obtain necessary technical information to support the review of the U.S. EPR FSAR. The document review portion of the audit was completed at 11:00 a.m.

ACTION ITEMS

1. NRC will request that a non-proprietary (redacted) and proprietary version of the meeting slides will be submitted by the applicant after the conclusion of the audit. This submission will include an associated affidavit supporting the claim of proprietary content under 10 CFR 2.390.

2. NRC staff will issue an RAI on Chapter 4 of the U.S. EPR FSAR to request that additional initial plant testing be added in order to verify the proposed processes and methodologies associated with the use of SPNDs in the U.S. EPR design.

3. An additional RAI will also include a question on cycle-specific calibration procedures that will be used for the U.S. EPR design and requesting a commitment to document specific procedures in the FSAR or other documentation. AREVA will decide how to address this concern in their application.

4. NRC staff will issue additional RAIs as necessary in order to obtain information in the audited documentation that is necessary to support the safety evaluation of Chapter 4 of the U.S. EPR FSAR.

AUDIT SUMMARY

The September 17, 2009, SPND audit was performed successfully at the AREVA Twinbrook office in Rockville, MD. The information presented by the applicant provided the staff with a better understanding of the approach the applicant intended to use to address staff concerns and technical issues related to the use of SPNDs in the U.S. EPR design, and this information will support the safety evaluation of Chapter 4 of the U.S. EPR FSAR and associated topical reports.

This audit identified the need for more information to support the safety evaluation of the U.S. EPR FSAR Chapters 4 and 14. It is expected that subsequent RAIs will be issued to obtain relevant technical information that will support the safety evaluation of the U.S. EPR FSAR.

Attachment A

Table 1: Modified Audit Agenda (as performed on 9/17/2009)

Item No.	Time	Item	Responsible Party
		09/17/2009	
1	8:00-8:05 am	Opening remarks, presentation of participants, organizational questions	J. Carneal and J. Budzynski (NRC)
2	8:05-8:30 am	Presentation by AREVA on SPND design, operation, calibration, and maintenance.	AREVA
3	8:30-9:00 am	Question / Answer Session on Presentation	AREVA / NRC staff and external experts
4	9:00-10:45 am	Audit of Technical Documentation	NRC staff and external experts
5	10:45-11:00 am	Audit Summary / Exit	AREVA / NRC staff and external experts

Attachment B

Attendee List
AUDIT TO REVIEW SELECTED AREAS RELATED TO U.S. EPR FSAR CHAPTER 4.4 SAFETY EVALUATION
September 17, 2009, AREVA NP, Inc., Rockville, MD

Name	Affiliation
John Budzynski	NRC
Michael Smith	AREVA
Mark Royal	AREVA
Victor Freginez	AREVA
Jerry Holm	AREVA
Shanlai Lu	NRC
Randy Belles	ORNL
Jose March-Leuba	ORNL
Jason Carneal	NRC
Jonathan Witter	AREVA

Attachment C

List of Audit Documentation Provided
SPND audit, 9/17/2009
AREVA Twinbrook Office
Rockville, MD

Applicant Document Number	Title
32-9061134-000	U.S. EPR: Evaluation of Incore Static Setpoints
NLLN-G/2009/en/1239	AMS Uncertainty Analysis
32-9026463-000	Cobalt SPND Deconvolution Analysis
51-9036961-000	Thermally Induced Current Effect
51-9046809-000	SPND Thermionic Uncertainty
ANP-10282P Revision 0	POWERTRAX/E Online Core Monitoring Software for the U.S. EPR Technical Report
LRC-9005-2557	Prompt-Responding Incore Detectors for PWRs – Status Report
32-9045765-000	SPND and Aeroball Thermo-hydraulic Analyses

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