

**U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NEW REACTORS
DESIGN CERTIFICATION AUDIT**

Organization: AREVA NP Inc.

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Nuclear Industry: AREVA NP, Inc., designs, builds, and starts up nuclear steam supply systems and supplies fuel, engineering services, and replacement components to U.S. nuclear utilities. AREVA NP, Inc. is one of the three major regions under AREVA NP. The other major regions include France (AREVA NP SAS) and Germany (AREVA NP GmbH).

Dates: June 2 and 3, 2009

NRC Staff: Jason Jennings, Project Manager, NRO/DNRL
Edward Roach, Senior Health Physicist, NRO/DCIP
Sara Bernal, Health Physicist, NRO/DCIP

NRC Contractors: Georgeta Radulescu, (ORNL)

NRC Management: Timothy Frye, Chief, NRO/DCIP/CHPB

1.0 SUMMARY

Over the course of two days in June of 2009, U.S. Nuclear Regulatory Commission (NRC) staff audited supporting documents related to Chapter 12 of the AREVA NP, Inc. (AREVA) U.S. EPR design certification (DC) application at the AREVA facility in Rockville, Maryland. The NRC staff audited documents that describe U.S. EPR shielding analysis and shielding design. These documents provide supporting design detail, calculations and assumptions for the shielding information contained within Chapter 12 of the docketed U.S. EPR Final Safety Analysis Report (FSAR). Therefore, the amount of detail included in these documents is higher than what is required in the FSAR. However, auditing such information allows the staff to conduct its review more efficiently. Specifically, the staff gains a better understanding of the basis underlying the formal application and identifies areas where additional information should be submitted to allow a licensing decision on the application.

The bases for the audit were:

- 10 CFR 50, Appendix A, General Design Criteria 61, "Fuel storage and handling and radioactivity control."
- Title 10 of the *Code of Federal Regulations* (10 CFR), Section 52.47, "Contents of Applications"
 - (a)(8): The information necessary to demonstrate compliance with any technically relevant portions of the Three Mile Island requirements set forth in 10 CFR 50.34(f), except paragraphs (f)(1)(xii), (f)(2)(ix), and (f)(3)(v).
- 10 CFR 50.9, "Completeness and Accuracy of Information."
- Title 10 Code of Federal Regulations (10 CFR) 20, "Standards for Protection Against Radiation."
- Regulatory Guide 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)," Section C.I.12.3.2, "Shielding."
- NUREG-0800, "Standard Review Plan," Sections 12.3-12.4, "Radiation Protection Design Features."
- Regulatory Guide (RG) 8.8, "Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations Will Be As Low As Is Reasonably Achievable."
- RG 1.69, "Concrete Radiation Shields for Nuclear Power Plants."

As a result of the audit, the staff wrote a request for additional information (RAI) to ensure that information needed for the staff's safety decision is properly included in the U.S. EPR docket file. These questions have been sent to AREVA as RAI 254 (Agencywide Documents Access and Management System (ADAMS) accession number ML091770351). The staff will refer to the FSAR, RAI responses, and the enclosed report, but not to the detailed documents reviewed at AREVA's site, in its safety evaluation of the U.S. EPR.

3.0 RESULTS OF AUDIT

3.1 Documents Audited

AREVA made the following documents available at its Rockville, Maryland, facility for audit by the NRC staff:

- U.S. EPR 3D image of spent fuel transfer tube
- Calculational package for AREVA response to RAI 150 (1606), Question 12.3-12.4-06
- AREVA presentation on U.S. EPR RANKERN shielding code use

3.2 Interaction with AREVA Staff

During the period covered by this summary, entrance and exit meetings as well as substantive discussions were held with AREVA staff at the Rockville, Maryland, facility.

ENCLOSURE

3.3 Issue Resolution

As a result of the audit, the staff identified issues with the U.S. EPR shielding design, as well as information needed to perform NRC staff confirmatory calculations to verify the conservatism of the applicant's shielding analysis methodology. To ensure that the docketed material supporting the U.S. EPR DC application is complete, the staff wrote questions on these issues. These have been sent to AREVA as RAI 254 ADAMS accession number ML091770351. The staff has not received responses to RAI 254 although the applicant has stated that responses would be provided by September 10, 2009. Future RAIs may also result from these responses. The staff will refer to the FSAR, RAI responses, and this report, but not to the detailed documents reviewed at AREVA's site, in its safety evaluation of the U.S. EPR.

3.4 Conclusions

The audit of supporting documents for the U.S. EPR shielding analysis methodology and shielding design allowed the staff to conduct its review of the U.S. EPR FSAR more efficiently. Specifically, the staff gained a better understanding of the basis underlying the formal application and identified areas where additional information should be submitted to allow a licensing decision on the application.

4.0 APPLICANT STAFF PARTICIPATING IN SUBSTANTIVE DISCUSSIONS

Pedro B. Perez, P.E., AREVA NP INC.
Ian Roger Terry, AREVA NP GmbH
Erik Baumann, AREVA NP GmbH