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U.S. Nuclear Regulatory Commission  
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Rockville, MD 20852

**NRC Staff Concerns Related to the U.S. EPR Digital Instrumentation and Control Systems Design**

- Ref. 1: Letter, David B. Matthews (NRC) to Pedro Salas (AREVA NP INC.), "NRC Staff Conclusions on Aspects of the U.S. EPR Digital Instrumentation and Control Systems Design," July 2, 2013.
- Ref. 2 Email, Dennis Williford (AREVA NP Inc.) to Michael Miernicki (NRC), "Response to U.S. EPR Design Certification Application RAI No. 555 (6611) FSAR Ch. 7, Supplement 6," May 31, 2013.

In Reference 1, the Nuclear Regulatory Commission (NRC) notified AREVA NP Inc. (AREVA NP) that the response to RAI No. 555, provided in Reference 2, was not acceptable. Specifically, the NRC Staff indicated that they are currently unable to determine whether the U.S. EPR instrumentation and control system (I&C) design includes sufficient independence and diversity to be able to reach the necessary safety conclusions.

AREVA NP is committed to ensuring that the U.S. EPR I&C design meets the applicable NRC regulatory requirements. AREVA NP reviewed the concerns raised by the NRC Staff in Reference 1, and identified certain key issues that should be addressed for AREVA NP to engineer a solution that will allow the NRC Staff to complete its review of AREVA NP's I&C design for the U.S. EPR.

AREVA NP considers that the primary concerns in the letter relate to compliance with Institute of Electrical and Electronics Engineers 603 Clause 5.6.3, "Independence Between Safety Systems and Other Systems." It is important that this issue be resolved in a manner that achieves an appropriate balance between the regulatory concerns, while maintaining the safety benefits of a highly integrated control room and digital I&C architecture. AREVA NP is therefore considering options for a combination of targeted design changes and additional analyses to achieve that balance, and to satisfy NRC Staff concerns related to spurious actuation of the non-safety related I&C systems.

Reference 1 states that "the U.S. EPR I&C design includes complexity that is unnecessary for the performance of safety functions." Though AREVA NP recognizes the intricacies of this largely digital and advanced I&C design, it is fundamental to the U.S. EPR design as it relates to the safety and efficiency of the plant. The U.S. EPR design integrates digital I&C and safety systems in a manner that improves the human-machine interfaces, and provides enhanced precision in monitoring and controlling plant functions to maintain safety.

The letter also questions the availability of design information at this stage of the review to address the concerns of the NRC Staff. As part of the initial preparation of the U.S. EPR Final Safety Analysis Report (FSAR),

**AREVA NP INC.**

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AREVA NP decided not to commit to a specific digital technology for the non-safety related I&C systems. This was a decision that, accordingly, resulted in a limited amount of design information provided by AREVA NP in the U.S. EPR FSAR. This decision is consistent with the regulatory philosophy that specification of design details in a DC application risks committing to obsolete technology. AREVA NP, therefore, chose an approach that carefully considered the role that design acceptance criteria can play in addressing the concerns of the NRC Staff.

AREVA NP values the NRC Staff commitment in the Reference 1 letter to continue the review of the remaining issues concerning the U.S. EPR design, while the I&C design safety concerns are addressed simultaneously on a separate path. Continued engagement with the NRC Staff is requisite to successfully completing the review of, and safety evaluation report for, all U.S. EPR FSAR chapters. In addition, AREVA NP will develop a detailed plan to address the I&C design concerns of the NRC Staff. AREVA NP anticipates completing its draft plan concerning the I&C design by mid-August 2013. Following completion of the draft, AREVA NP expects to coordinate a meeting with the NRC Staff to discuss the plan before implementing the targeted design changes and performing additional analyses.

If you have any questions related to this information, please contact Len Gucwa by telephone at (434) 832-3466, or by email at [Len.Gucwa.ext@areva.com](mailto:Len.Gucwa.ext@areva.com).

Sincerely,

A handwritten signature in black ink, appearing to read 'Pedro Salas', is written over a horizontal line. The signature is stylized and somewhat illegible.

Pedro Salas, Director  
Regulatory Affairs  
AREVA NP Inc.

cc: J. P. Segala  
A. M. Snyder  
G. M. Tracy  
Docket 52-020