



January 23, 2009
NRC:09:004

Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

U.S. EPR Instrumentation and Controls Topical Reports

Ref. 1: Letter, Getachew Tesfaye (NRC) to Ronnie L. Gardner (AREVA NP Inc.), "AREVA NP, Inc. – Review Status of the AV42 Priority Actuation and Control Module Topical Report – ANP-10273P (TAC No. MD3867)," January 8, 2009.

Ref. 2: Letter, Getachew Tesfaye (NRC) to Ronnie L. Gardner (AREVA NP Inc.), "AREVA NP, Inc. – Review Status of the U.S. EPR Instrumentation and Control Diversity and Defense-in-Depth [D3] Methodology Topical Report – ANP-10284 (TAC No. MD5884)," January 8, 2009.

The NRC and AREVA NP Inc. (AREVA NP) met on January 15, 2009, to discuss preliminary results and status of the NRC review of four topical reports on the subject of instrumentation and controls (I&C) referenced in the application for design certification of the U.S. EPR. At the meeting, AREVA NP accepted an action to provide feedback to the NRC within one week describing the proposed path forward for review of these topical reports. This letter provides the requested information. Each of the topical reports is addressed separately below. For each topical report, AREVA NP provides its understanding of the key issues as presented by the NRC staff at the January 15 meeting, along with the proposed path forward.

Software Program Manual Topical Report

The NRC staff presented eight remaining issues regarding the Software Program Manual Topical Report. The NRC staff further stated they may have additional issues not provided in the presentation. The NRC staff took an action to provide a letter to AREVA NP identifying the complete list of issues considered outstanding within one month (by mid-February). The NRC staff also indicated they would arrange a meeting or an on-site audit with AREVA NP in February to discuss the Software Program Manual Topical Report and the complete set of issues.

Based on the information presented by the NRC staff, AREVA NP will submit an interim revision of the Software Program Manual Topical Report by February 18, 2009. The interim revision will incorporate changes associated with the RAI responses provided to the NRC to date. The purpose of providing the interim revision is to allow the reviewers to see the collective impact of the changes made as a consequence of the RAI responses.

AREVA NP requests a meeting with the NRC following receipt of the NRC letter identifying all remaining issues, to obtain final clarification and to agree upon the proposed revisions to the topical report. Subsequent to the meeting, AREVA NP will submit Revision 1 of the Software Program Manual Topical Report.

In Revision 1 of the Software Program Manual Topical Report, explicit references to the SIVAT tool will be removed. The report will be revised to allow the use of an approved simulation test tool for application software integration testing in accordance with any NRC Safety Evaluation Report (SER) for such a tool. A separate topical report on SIVAT will be submitted for NRC review and approval at a later date.

It is AREVA NP's understanding that the approach described above will allow the review of the Software Program Manual Topical Report to proceed in parallel with the design certification review of the U.S. EPR, and that approval of the SIVAT topical report will be conducted independent of the design certification review. That is, AREVA NP would not reference the SIVAT topical report in the design certification application, nor would the SER for the design certification depend upon the SIVAT topical report. However, AREVA NP will submit the SIVAT topical report in sufficient time to support its review and approval for use on U.S. EPR projects.

AV42

The NRC staff discussed the two issues identified in a letter to AREVA NP dated January 8, 2009 (Reference 1). The first issue is related to the treatment of the AV42 module as a hardware device with an alternate approach to qualification testing than the approach outlined in Digital I&C Interim Staff Guidance No. 4 (ISG-4). The staff stated its position that the options were either to demonstrate 100% testability or treat the firmware development process in accordance with BTP 7-14 and address the possibility of software common mode failures. The NRC staff further stated one way to address common mode failure would be to demonstrate sufficient diversity.

AREVA NP proposed a combined approach to address common mode failure consisting of three elements:

1. Decomposition testing as previously proposed.
2. Safety-related process control of the programming tool and associated software development for PLD firmware programming in accordance with BTP 7-14.
3. Inherent design characteristics of the AV42 device, including inherently simple PLD firmware design and absence of computer processors and active software for safety function operation.

The NRC staff appeared to reject this approach, stating it would be difficult to approve. The NRC staff added that a draft NUREG is being prepared to address diversity and will be available for industry comment soon. The NRC staff also stated that there would be a presentation on diversity at the March 2009 Regulatory Information Conference.

The second issue is related to independence of safety and non-safety components on the AV42 device. The NRC staff stated that on the basis of their interpretation of IEEE 603, IEEE 7-4.3.2 and Regulatory Guide 1.152, they could not approve the AV42 device as currently presented. The NRC staff has interpreted these documents to require the PROFIBUS controller software to be classified safety-related because the chip is on the same board as the safety-related Programmable Logic Device (PLD) chip. In response, AREVA NP proposed a regulatory

approach involving a relief request from the relevant portions of the IEEE standards, as allowed by 10 CFR 50.55a(3), based on design attributes of the AV42 device. The NRC staff indicated this approach could potentially provide a path forward, assuming a suitable relief request and sufficient supporting justification is provided.

AREVA NP is evaluating the clarifications provided by the NRC staff during the January 15 meeting. Considering the complexity of the technical and regulatory issues involved, emergent regulatory guidance, and the potential for design impacts, AREVA NP believes additional interaction is necessary prior to making a final decision regarding the path forward for review of the AV42 Topical Report. Therefore, AREVA NP requests a follow-up meeting with the NRC staff in February 2009. Subsequent to such a meeting, AREVA NP will provide information to the NRC in a timely manner regarding the proposed path forward.

Diversity and Defense-in-Depth (D3)

The NRC staff discussed the issues identified in a letter to AREVA NP dated January 8, 2009 (Reference 2). The issues fall into two categories: those related to lack of information or insufficient level of detail in the topical report, and an issue related to component-level versus system-level manual actuation.

To address issues in the first category, AREVA NP intends to revise the D3 Topical Report to include additional information and more detail to demonstrate diversity and defense-in-depth of the U.S. EPR design. AREVA NP intends to submit a revised version of the D3 Topical Report in November 2009.

The second issue pertains to diverse manual controls to address BTP 7-19 Point 4. The NRC staff concerns center around the proposed use of component level controls diverse from the safety system as opposed to system-level controls diverse from the safety system. During the discussion, it was suggested that AREVA NP needed to provide better justification for approaches which the NRC staff identified as deviations from NRC guidance or policy. AREVA NP is considering the regulatory interpretations and positions conveyed by the NRC staff at the January 15 meeting, including potential design implications. AREVA NP anticipates completely addressing this issue by revision of the D3 Topical Report in November 2009.

AREVA NP proposes to have periodic meetings with the NRC reviewers, at a mutually agreed schedule, between now and the time of submittal of the revised topical report, to keep NRC reviewers apprised of the report status.

Digital Protection System

The NRC staff reviewed the issues identified in the three questions in the draft Request for Additional Information (RAI) already provided to AREVA NP. The first two questions pertain to the Self-Powered Neutron Detector (SPND) ring networks and compliance with General Design Criteria (GDC) 21 and 23. AREVA NP will address these two questions as part of the normal RAI response process, by March 2009.

The third question pertains to manual, system-level controls, and the expectations identified in Regulatory Guide 1.62 and the recently-issued DG-1190. The NRC staff concerns center around two areas: the amount of equipment common to manual and automatic initiation, and the point at which manual controls are connected to safety equipment relative to the digital safety system outputs. During the discussion, it was suggested that AREVA NP needed to

provide better justification for approaches which the NRC staff identified as deviations from NRC guidance or policy.

AREVA NP is considering the regulatory interpretations and positions conveyed by the NRC staff at the January 15 meeting, including potential design implications. At this time, AREVA NP is evaluating options for moving forward with the review of the Digital Protection System Topical Report. AREVA NP will inform the NRC in February 2009 regarding the proposed path forward for the review of the Digital Protection System Topical Report.

Closing

AREVA NP appreciates the opportunity to receive direct, coordinated feedback from the NRC staff involved in the review of U.S. EPR I&C topical reports. Regular and frequent communications between AREVA NP and the NRC staff are essential to timely resolution of digital I&C-related issues. To that end, AREVA NP requests monthly management phone calls with the NRC staff to facilitate communication of status on I&C-related issues. Furthermore, AREVA NP will support phone calls, meetings, and audits at a mutually agreed upon frequency to facilitate resolution of the remaining technical and licensing issues. Ronda Pederson of AREVA NP New Plants Regulatory Affairs, will contact the NRC Lead Project Manager for the U.S. Design Certification Review, Getachew Tesfaye, will arrange the schedule for these interactions.

Sincerely,



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

cc: G. Tesfaye
Docket No. 52-020