

December 4, 2006

APPLICANT: AREVA NP

PROJECT: EPR PRE-APPLICATION REVIEW

SUBJECT: SUMMARY OF AUGUST 31, 2006, MEETING WITH AREVA NP REGARDING INSTRUMENTATION AND CONTROLS FOR THE EVOLUTIONARY POWER REACTOR (EPR)

On August 31, 2006, a public meeting was held between representatives of the U.S. Nuclear Regulatory Commission (NRC) staff and AREVA NP (AREVA). The purpose of this meeting was to discuss the instrumentation and controls (I&C) system for the EPR design. A list of meeting attendees is included as Enclosure 1. Enclosure 2 contains a copy of handouts AREVA provided at the meeting (ADAMS Accession Number ML062480222). The NRC staff found that one slide could contain sensitive unclassified national security information, so that slide has been removed from the handout package. A summary of the meeting is provided below.

AREVA described the EPR I&C system architecture, the function of individual subsystems for plant control, reactor trip, and engineered safety features actuation, and the physical arrangement of I&C systems around the facility. AREVA also provided a brief comparison of regulatory differences between Finland, France, and the U.S. that affect I&C designs planned for deployment in EPRs in each nation. For example, a backup analog I&C system is being required for the EPR being constructed at Olkiluoto in Finland. Only digital systems are planned for deployment in France or the U.S.

AREVA reviewed operation of the Teleperm XS system which is used to control I&C communications. The NRC staff has accepted a topical report on the Teleperm XS system as documented in a May 5, 2000 safety evaluation (ADAMS Accession Number ML003711856), subject to limitations described in the topical report and the staff's safety evaluation.

AREVA described operation of the EPR Protection System which is used for generation of reactor trip signals. The design of this system is intended to provide a high degree of redundancy and diversity.

The operation of the AV42 Priority Control Modules in the Priority Actuation and Control System (PACS) was also discussed. The AV42 is a hard-wired component with no operating software, and interfaces both with safety related and non-safety related systems. The staff noted that there may be concerns regarding safety related and non-safety related functions being on the same circuit board. The staff also noted interest in understanding if an operator can interface with this system to interdict spurious actuation signals. AREVA indicated it understands its obligation to demonstrate how relevant regulatory requirements are met by its design. The AV42 system is the subject of a topical report AREVA plans to submit in December 2006.

AREVA described its approach to address diversity and defense-in-depth issues. AREVA prefers an approach it designated as "No Common-Mode Failure Approach." AREVA does not expect this approach to be acceptable to the NRC. However, AREVA believes that the approach currently described in Branch Technical Position-19 adds unnecessary complexity and the potential for spurious actuation. A topical report on EPR I&C diversity and defense-in-depth is planned for submittal in June 2007.

The control room layout of the U.S. EPR will be somewhat different than the design being completed for the Olkiluoto EPR. The analog backup systems required in Finland require additional space which will not be needed for the digital-only U.S. design. AREVA stated that the human-machine interface planned for the U.S. EPR meets the requirements of 10 CFR 50.52(m). The presentation included a set of preliminary digital control screen designs developed for Olkiluoto.

AREVA reviewed the set of topical reports on I&C and human factors issues that it plans to submit during the EPR pre-application review. Seven topical report submittals are planned starting in December 2006, with additional reports submitted through June 2007. The design certification application is expected in December 2007.

A public stakeholder also asked questions of the NRC staff at designated points during the meeting. The staff referred the stakeholder to the Standard Review Plan as a source of information regarding definition of safe shutdown. The stakeholder also asked about whether some credit, such as extended surveillance intervals, may be taken for digital equipment self-testing. The staff responded that requests for credit would be evaluated on a case-by-case basis. The staff was asked if it had the ability to review digital components such as those described at the meeting, and responded that regulatory guidance is being updated, including evaluation of research needs. The staff was asked if common mode failure would be imposed on the AV42 device described by AREVA. The staff responded that there was insufficient information available at this time to make that determination. A question regarding environmental qualification of digital equipment was considered outside the scope of this meeting, and so was not addressed.

Questions regarding this meeting can be directed to Larry Burkhart at 301-415-1311 or at lib3@nrc.gov.

/RA/

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Division of New Reactor Licensing
Office of New Reactors

Project 733

Enclosure:
As stated

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Letter from Larry Burkhart dated December 4, 2006

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INSTRUMENTATION AND CONTROLS FOR THE EVOLUTIONARY POWER
REACTOR (EPR)

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August 31, 2006

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