



Digital I&C D3 Discussion for AREVA NP, Inc, U.S. EPR Design Certification

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**September 2nd and 3rd, 2009
Church St. Rm 6B01**



- 1. Opening remarks and introductions**
- 2. Discussion of issues within NRC letter to AREVA NP, Inc., dated January 8th, 2009 [ML090070579, ML090070606]**

(NOTE: Commitments for AREVA NP, Inc. (AREVA), were quoted from AREVA letter to NRC dated March 30, 2009 [ML090910632], that were contained within Attachment A of letter.)

Agenda

- BTP 7-19 Branch Technical Position 7-19, "Guidance for Evaluation of Diversity and Defense-in-Depth in Digital Computer-Based Instrumentation and Control Systems," Revision 5
- CCF Common Cause Failure
- DAS Diverse Actuation System
- D3 Diversity and Defense-in-Depth
- FSAR Final Safety Analysis Report
- NRC Nuclear Regulatory Commission
- PICS Process Information and Control System
- Point 1,2,3,4 Four-point Position on D3 for Advanced Light Water Reactors
- PS Protection System

Acronym Definitions

1. NUREG/CR-6303 Guideline 2 Diversity Analysis between DAS and PS
2. Type of Environment DAS equipment would be installed and assurance that DAS is able to operate in environment during normal operation
3. How is DAS actuation status and completion of DAS protective actions confirmed
4. DAS actuation not to interfere with PS actuation
5. DAS design features to reduce spurious trips and actuations
6. BTP 7-19 Points 2 & 3 of the Four Point Position on D3
7. DAS/PICS manual initiation at component level versus system level

Issues Raised within enclosure to NRC Letter dated January 8th, 2009 [ML090070606]



- NRC staff noted there was insufficient information regarding Diversity Analysis between DAS and PS
- AREVA NP, Inc. (AREVA NP), suggested action to revise FSAR Section 7.8 to contain a list of specific attributes that support a determination of adequate diversity
- In FSAR, Revision 1, and D3 Technical Report (ANP-10304, Revision 0), staff could not identify the list of diversity attributes to meet guidance of NUREG/CR-6303 Guideline 2 Diversity Analysis

Issues - NUREG/CR-6303 Diversity Analysis

- NRC staff noted there was insufficient information regarding environment for DAS equipment and assurance that DAS is able to operate in environment during anticipated operational occurrences and normal plant operation
- AREVA NP suggested action to modify FSAR Section 7.8, and submit by the end of May 2009
- In FSAR, Revision 1, and D3 Technical Report (ANP-10304, Revision 0), staff could not identify description of operating environment for DAS equipment

Type of Environment for DAS Equipment

- NRC staff noted there was insufficient information describing how DAS actuation status of the systems and components actuated by DAS is confirmed and completion of DAS protective actions
- AREVA NP suggested action to modify FSAR, Tier 2, Section 7.8, and submit by the end of May 2009
- In FSAR, Revision 1, and D3 Technical Report (ANP-10304, Revision 0), staff could not identify information describing how confirmation of DAS actuation is accomplished

How is DAS actuation status confirmed

- NRC staff noted there was insufficient information describing how the DAS is designed such that its actuation signals and its initiation of protective functions do not interfere with the PS actuation process or actuation (i.e., setpoint offset or time delays)
- AREVA NP suggested action to modify FSAR Section 7.8, and submit by the end of May 2009
- In FSAR, Revision 1, and D3 Technical Report (ANP-10304, Revision 0), staff could not identify information to demonstrate why DAS actuation will not interfere with PS actuation

DAS actuation should not interfere with PS actuation

- NRC staff noted there was insufficient information describing how the DAS design features reduce the effects of spurious trips and actuations
- AREVA NP suggested action to modify FSAR Section 7.8, and submit by the end of May 2009
- In FSAR, Revision 1, and D3 Technical Report (ANP-10304, Revision 0), staff could not identify information describing how DAS design reduces effects of spurious trips and actuations

DAS design features to reduce spurious actions

- NRC staff noted that the plant response calculated using best-estimate analyses for each anticipated operational occurrence and each postulated accident in the design basis occurring in conjunction with each single postulated CCF to demonstrate that adequate diversity and adequate protection exists was not provided
- AREVA NP provided a Qualitative Evaluation (based on engineering judgment) with results of evaluation in Appendix A (Table A-3) of the D3 Technical Report (ANP-10304)
- AREVA NP proposed to carry BTP 7-19 Points 2 & 3 as an open item until submission of results of the confirmatory analysis (November 2009)

Points 2 & 3 of the Four Point Position on D3

- NRC staff noted that DAS component level manual initiation is inconsistent with NRC staff guidance and Point 4 which indicates a need for system-level manual actuation.
- AREVA NP provided powerpoint presentation at public meeting (April 29-30, 2009 / ML091040327) which included proposed DAS design to use system-level manual actuation (slide 7 of presentation)
- FSAR, Revision 1, and D3 Technical Report (ANP-10304, Revision 0) demonstrate that DAS/PICS perform manual actuations at the component level

DAS/PICS manual initiation at component level versus system level



Questions?

Current Status of I&C D3 Review for U.S.EPR Design Certification

Thank You

