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March 30, 2009

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ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: UniStar Nuclear Energy, NRC Docket No. 52-016
Response to Request for Additional Information for the
Calvert Cliffs Nuclear Power Plant, Unit 3,
RAI No. 46, Revision 0, Equipment Qualification

References: 1) John Rycyna (NRC) to Robert Poche (UniStar), "RAI No 46 CIB1 1437.doc,"
email dated January 27, 2009

The purpose of this letter is to respond to the request for additional information (RAI) identified in the NRC e-mail correspondence to UniStar Nuclear, dated January 27, 2009 (Reference 1). This RAI addresses Equipment Qualification, as discussed in Section 3.9.6 of the Final Safety Analysis Report, as submitted in Part 2 of the Calvert Cliffs Nuclear Power Plant, Unit 3 Combined License Application, Revision 4.

The enclosure provides our response to RAI No. 46, Questions 03.09.06-1 and 03.09.06-2. COLA impacts associated with the RAI responses are noted with the question response. A Licensing Basis Document Change Request has been initiated to incorporate these changes into a future revision of the COLA. Our responses to Questions 03.09.06-1 and 03.09.06-2 do not include any new regulatory commitments.

If there are any questions regarding this transmittal, please contact me at (410) 470-4205, or Mr. Michael J. Yox at (410) 495-2436.

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I declare under penalty of perjury that the foregoing is true and correct.

Executed on March 30, 2009



Greg Gibson

Enclosure: Response to NRC Request for Additional Information, RAI No. 46, Questions
03.09.06-1 and 03.09.06-2, Equipment Qualification, Calvert Cliffs Nuclear Power
Plant, Unit 3

cc: John Rycyna, NRC Project Manager, U.S. EPR COL Application
Thomas Fredrichs, NRC Environmental Project Manager, U.S. EPR COL Application
Getachew Tesfaye, NRC Project Manager, U.S. EPR DC Application (w/o enclosure)
Loren Plisco, Deputy Regional Administrator, NRC Region II (w/o enclosure)
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Enclosure

**Response to NRC Request for Additional Information
RAI No. 46, Questions 03.09.06-1 and 03.09.06-2, Equipment Qualification
Calvert Cliffs Nuclear Power Plant, Unit 3**

RAI No. 46

Question 03.09.06-1

Question - Fully describe the Calvert Cliffs Nuclear Power Plant (CCNPP) Unit 3 mechanical equipment qualification (MEQ) program or modify the FSAR to detail the MEQ's compliance with ASME Standard QME-1-2007, including example descriptions of component qualification.

Discussion - 10 CFR 52.79(a)(11) requires a COL applicant to provide a description of the program(s), and their implementation, necessary to ensure that the systems and components meet the requirements of the ASME Boiler and Pressure Vessel Code and the ASME Code for Operation and Maintenance of Nuclear Power Plants in accordance 10 CFR 50.55a (e.g., pre-service and inservice testing programs). The Statements of Consideration associated with this requirement clarifies that an ITAAC for an [operational] program should not be necessary if the program and its implementation are "fully described" in the application and found to be acceptable by the NRC at the COL stage. In this context, fully described should be understood to mean that the program is clearly and sufficiently described in terms of the scope and level of detail to allow a reasonable assurance finding of acceptability. Required programs should always be described at a functional level and at an increased level of detail where implementation choices could materially and negatively affect the program effectiveness and acceptability (see also SECY-05-0197 and Regulatory Guide 1.206, Section C.IV.4).

Inasmuch as the CCNPP Unit 3 FSAR incorporates by reference the inservice testing (IST) program described in the U.S. EPR design certification application (with additions only as they relate to the site-specific, ultimate-heat-sink makeup water system), the COL applicant appears to be relying on the DC applicant to fully describe its IST program. Similarly, the COL applicant appears to be relying on the DC applicant to fully describe its program to ensure the functional design and qualification of mechanical equipment. A clearly defined MEQ program forms the basis, or foundation, on which an inservice testing program should be built. The DC application provides a description of an IST program; however, it does not fully describe the MEQ program to allow a reasonable assurance finding of acceptability. Specifically, the MEQ program for the U.S. EPR has not been "fully described" in that many implementation choices remain unanswered which could materially and negatively affect the program effectiveness and acceptability.

General Design Criteria (GDC) 4 requires, in part, that structures, systems, and components (SSCs) important to safety shall be designed to accommodate the effects of and to be compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents, including loss-of-coolant accidents. As documented in numerous NRC generic communication and issuances (e.g., Generic Letters 89-10 and 96-05, Regulatory Issue Summary 2000-03, NUREG-1275), weaknesses in licensees' mechanical equipment qualification programs have lead to situations in which SSCs may not have been able to perform their safety-related function(s) under design-basis conditions as required by GDC 4. As a result of these lessons learned from operating experience, NUREG-0800 (Section 3.9.6), Regulatory Guide 1.206 (Section C.III.1, C.I.3.9.6.1), and QME-1 have been revised to provide guidance related to the functional design and equipment qualification of safety-related pumps and valve. The provisions of the ASME Code alone do not adequately assess the functional design and qualification of safety-related pumps and valves.

Specifically, the ASME Code does not require testing and/or analysis to ensure that each pump and valve is capable of performing its intended function for a full range of system differential pressure and flow, ambient temperatures, and available voltages (as applicable) under all conditions ranging from normal operating to design-basis accident conditions. As such, an IST program which satisfies the provisions of the ASME Code is not, in and of itself, sufficient to satisfy GDC 4. Therefore, the COL applicant should fully describe its MEQ program, or specify implementation of QME-1-2007, including example descriptions of component qualification.

Response

The subject of mechanical equipment qualification (MEQ) program was discussed with the NRC at the U.S. EPR Design Center Working Group (DCWG) meeting held on January 16, 2009. At that meeting, the DCWG agreed that a "fully described" program be included within the U.S. EPR FSAR by the design certification applicant (AREVA). Additionally, AREVA agreed to discuss specific details regarding the MEQ program with NRC staff to address additional content needs for a "fully described" program for inclusion within the U.S. EPR FSAR. As such, specific questions regarding the MEQ program will be addressed by AREVA within the scope of the U.S. EPR design certification application.

COLA Impact

The COL FSAR will not be revised as a result of this response.

Question 03.09.06-2

Question - Fully describe the CCNPP Unit 3 IST program to the extent that implementation choices that could materially or negatively affect the program effectiveness and acceptability are clearly specified.

Discussion - 10 CFR 52.79(a)(11) requires a COL applicant to provide a description of the program(s), and their implementation, necessary to ensure that the systems and components meet the requirements of the ASME Boiler and Pressure Vessel Code and the ASME Code for Operation and Maintenance of Nuclear Power Plants in accordance 10 CFR 50.55a (e.g., pre-service and inservice testing programs). The Statements of Consideration associated with this requirement clarifies that an ITAAC for an [operational] program should not be necessary if the program and its implementation are "fully described" in the application and found to be acceptable by the NRC at the COL stage. In this context, fully described should be understood to mean that the program is clearly and sufficiently described in terms of the scope and level of detail to allow a reasonable assurance finding of acceptability. Required programs should always be described at a functional level and at an increased level of detail where implementation choices could materially and negatively affect the program effectiveness and acceptability (see also SECY-05-0197 and Regulatory Guide 1.206, Section C.IV.4).

The CCNPP Unit 3 FSAR incorporates by reference the inservice testing (IST) program described in the U.S. EPR design certification application (with additions only as they relate to the site-specific, ultimate-heat-sink makeup water system) The DC application provides a description of an IST program; however, it does not fully describe the program to allow a reasonable assurance finding of acceptability. In order for the NRC staff to reach a conclusion that the systems and components meet the requirements of the ASME OM Code, the staff needs a complete and unambiguous description of the program. For example, statements like the following do not fully describe an IST program:

- "The IST program complies with the requirements of Reference 2 [the 2004 version of the OM Code], Subsection ISTC, to the extent practical."
- "The IST program incorporates nonintrusive techniques to periodically assess the degradation and performance of selected valves."
- "Additional tests: Various other tests may be required to confirm that an adequate margin exists in MOV capability."
- "The IST program for POVs includes programmatic features similar to the Joint Owners Group (JOG) Program in response to Reference 4."
- "If these test methods are impractical for certain check valves, or if sufficient flow cannot be achieved or verified, a sample disassembly examination program verifies valve obturator movement." [However, no check valves were identified as falling into this category.]

Without more definitive statements about the IST program (e.g., to correct ambiguities like those noted above and to clearly describe how disassembly and inspection, nonintrusive testing, and diagnostic testing will be used), the NRC staff is unable to conclude that the applicant meets the ASME Code requirements and assess whether or not the COL applicant's implementation choices, related to the IST program, will materially or negatively affect the program effectiveness and acceptability. The applicant's IST program should outline methods for measuring the reference values and IST values for power-operated valves (POVs), including motor-operated valves (MOVs), air-operated valves (AOVs), hydraulically-operated valves (HOVs), and solenoid-operated valves (SOVs).

The applicant's IST program should also incorporate the lessons learned from the resolution of weaknesses in the design, qualification, and testing of MOVs into the IST program for safety-related POVs, including MOVs. Consequently, the COL applicant will be required to make and describe those implementation choices necessary to fully describe its IST program.

Response

As discussed with the NRC at the U.S. EPR Design Center Working Group (DCWG) meeting held on March 4, 2009, the "fully described" inservice testing (IST) program is included within the U.S. EPR FSAR by the design certification applicant (AREVA). CCNPP Unit 3 FSAR Section 3.9.6 will be revised to reflect this.

COLA Impact

FSAR Section 3.9.6 will be updated as follows in a future COLA revision:

3.9.6 FUNCTIONAL DESIGN, QUALIFICATION, AND INSERVICE TESTING PROGRAMS FOR PUMPS, VALVES, AND DYNAMIC RESTRAINTS

The U.S. EPR FSAR includes the following COL Items in Section 3.9.6:

A COL applicant that references the U.S. EPR design certification will submit the PST program and IST program for pumps, valves, and snubbers as required by 10 CFR 50.55a.

A COL applicant that references the U.S. EPR design certification will identify the implementation milestones and applicable ASME OM Code for the preservice and inservice examination and testing programs. These programs will be consistent with the requirements in the latest edition and addenda of the OM Code incorporated by reference in 10 CFR 50.55a on the date 12 months before the date for initial fuel load.

These COL Items are addressed as follows:

{Constellation Generation Group and UniStar Nuclear Operating Services} will implement the preservice testing (PST) and inservice testing (IST) programs for pumps, valves, and dynamic restraints described in Section 3.9.6 of the U.S. EPR FSAR. Because of site specific needs, the following supplements will be included in the programs.

- {The UHS Makeup Water System is a site-specific safety-related system that is subject to ~~preservice testing (PST)~~ and ~~inservice testing (IST)~~ program requirements identified in 10 CFR 50.55a. This system's pumps, valves and piping components included in these testing programs are provided in Table 3.9-1 and Table 3.9-2. There are no snubbers in the UHS Makeup Water System.}

{Constellation Generation Group and UniStar Nuclear Operating Services} shall submit the PST and IST programs prior to performing the tests and following the start of construction and prior to the anticipated date of commercial operation, respectively. The implementation milestones for these programs are provided in Table 13.4-1.

These programs shall include the implementation milestones and applicable ASME OM Code (ASME, 2004b) and shall be consistent with the requirements in the latest edition and addenda of the OM Code incorporated by reference in 10 CFR 50.55a (CFR, 2008) on the date 12 months before the date for initial fuel load.