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Your ref: Docket No. 52-006  
Our ref: DCP/NRC2146

May 30, 2008

Subject: AP1000 Responses to Requests for Additional Information (SRP3.11)

Westinghouse is submitting responses to the NRC requests for additional information (RAIs) on SRP Section 3.11. These RAI responses are submitted in support of the AP1000 Design Certification Amendment Application (Docket No. 52-006). The information included in the responses is generic and is expected to apply to all COL applications referencing the AP1000 Design Certification and the AP1000 Design Certification Amendment Application.

Responses are provided for RAI-SRP3.11-CIB1-01 and -02, as sent in an email from Mike Miernicki to Sam Adams dated April 21, 2008. These responses complete all requests received to date for SRP Section 3.11.

Questions or requests for additional information related to the content and preparation of these responses should be directed to Westinghouse. Please send copies of such questions or requests to the prospective applicants for combined licenses referencing the AP1000 Design Certification. A representative for each applicant is included on the cc: list of this letter.

Very truly yours,

A handwritten signature in black ink, appearing to read 'Robert Sisk'.

Robert Sisk, Manager  
Licensing and Customer Interface  
Regulatory Affairs and Standardization

/Enclosure

1. Responses to Requests for Additional Information on SRP Section 3.11

cc: D. Jaffe - U.S. NRC 1E  
E. McKenna - U.S. NRC 1E  
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P. Ray - TVA 1E  
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ENCLOSURE 1

Responses to Requests for Additional Information on SRP Section 3.11

# AP1000 TECHNICAL REPORT REVIEW

## Response to Request For Additional Information (RAI)

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RAI Response Number: RAI-SRP3.11-CIB1-01

Revision: 0

### **Question:**

Describe the implementation of the methodology for environmental qualification of safety-related mechanical equipment to be used in the AP1000 reactor for NRC staff audit. Section 3.11, "Environmental Qualification of Mechanical and Electrical Equipment," in Chapter 3, "Design of Structures, Components, Equipment and Systems," of proposed Revision 16 to the AP1000 DCD Tier 2 presents information to demonstrate that the mechanical and electrical portions of plant safety systems are capable of performing their designated functions while exposed to applicable normal, abnormal, test, accident, and post-accident environmental conditions. Appendix 3D, "Methodology for Qualifying AP1000 Safety-Related Electrical and Mechanical Equipment," to Chapter 3 describes the methodology adopted to qualify equipment for use by COL applicants to construct and operate nuclear power plants with the AP1000 reactor design. The AP1000 DCD and the Bellefonte COL application do not describe the implementation of the methodology to environmentally qualify safety-related mechanical equipment. During the March 26-27 public meeting, Westinghouse stated that procurement specifications were being prepared for safety-related equipment to be used in the AP1000 reactor design. Procurement specifications would be one method of describing the implementation of the methodology for environmental qualification of safety-related mechanical equipment to satisfy the acceptance criteria in SRP Section 3.11.

### **Westinghouse Response:**

Safety-related mechanical equipment can be located in a mild or harsh environment. The safety-related functions of mechanical equipment shall be shown to be acceptable under the required operating conditions and environmental parameters. The AP1000 harsh and mild environmental conditions are supplied to the vendor in the design and qualification specifications. The vendor shall use these environmental conditions in the design and qualification of the equipment for a 60 year design life.

For mechanical equipment, there are two classifications of components: active equipment which performs a mechanical motion as part of its safety-related function and non-active (passive) equipment whose only safety related function is structural integrity.

Non-active mechanical equipment whose only safety function is structural integrity is designed according to ASME Code guidelines. Aging qualification of metallic of the equipment shall be in compliance with ASME Section XI requirements. The environmental qualification program for non-active mechanical equipment is restricted to evaluating the critical pressure retaining nonmetallic subcomponents of non-active devices in a harsh environment.

# AP1000 TECHNICAL REPORT REVIEW

## Response to Request For Additional Information (RAI)

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Active mechanical equipment qualification program shall demonstrate that the equipment can perform its safety-related function under operational and environmental conditions. Operability of active mechanical equipment shall be performed based on the guidance of ASME QME-1-2002, "Qualification of Active Mechanical Equipment in Nuclear Power Plants." The environmental qualification program for active mechanical equipment in a harsh environment is based on a combination design, test and analysis of critical nonmetallic subcomponents, which would be supported by a surveillance and maintenance program. The significant aging mechanisms shall be identified and accounted for in an aging program. The environmental qualification program for mechanical equipment is based on the guidance provided in ASME QME-1-2002, Appendix QR-B. The aging analysis of non-metallic components with significant aging mechanisms is used to determine or extend active mechanical equipment life. In addition, an operability program is performed for active mechanical equipment electrical appurtenances (e.g. valve operators, limit switches) to demonstrate environmental qualification through testing (thermal, radiation, aging, vibration, seismic, DBA) based on the guidance of IEEE Std. 323-1974 and IEEE Std. 344-1987.

In a mild environment there are no degrading environmental effects that would lead to a common mode failure of the equipment. The plant surveillance and maintenance activities are used to address any materials determined to degrade over the installed life of the equipment and frequency interval of replacement as specified by the vendor to maintain equipment performance. The mild environment qualification of safety-related mechanical equipment is demonstrated and maintained through the plant surveillance and maintenance activities performed over the installed life of the equipment.

**Design Control Document (DCD) Revision:**

None

**PRA Revision:**

None

**Technical Report (TR) Revision:**

None

# AP1000 TECHNICAL REPORT REVIEW

## Response to Request For Additional Information (RAI)

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RAI Response Number: RAI-SRP3.11-CIB1-02

Revision: 0

### **Question:**

Specify the necessary actions for the COL applicant to establish the process and procedures for accepting, maintaining, and storing equipment qualification files discussed in Section 3.11.5, "Combined License Information Item for Equipment Qualification File," in proposed Revision 16 to the AP1000 DCD. This section states that the COL holder will define the process and procedures for which the equipment qualification files will be accepted from Westinghouse and how the files will be retained and maintained in an auditable format for the period that the equipment is installed and/or stored for future use in the nuclear power plant. The section does not specify actions for the COL applicant to establish the process and procedures for accepting, maintaining, and storing equipment qualification files.

### **Westinghouse Response:**

Westinghouse Electric Company LLC will act as the agent for the COL holder during the equipment design phase, equipment selection and procurement phase, equipment qualification phase, plant construction phase, and ITAAC inspection phases.

The COL holder will define the process and procedures for which the equipment qualification files to be received from Westinghouse and how the files will be retained and maintained in an auditable format for the time period that the equipment is installed and/or stored for future use in the nuclear power plant.

The Bellefonte COLA FSAR section 3.11.5 provides the supplemental information to fully describe the process for retention and maintenance of the EQ documentation for the operational life of the plant.

### **Design Control Document (DCD) Revision:**

None

### **PRA Revision:**

None

### **Technical Report (TR) Revision:**

None

