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Your ref: Docket No. 52-006
Our ref: DCP_NRC_002776

February 16, 2010

Subject: AP1000 Response to Proposed Open Item (Chapter 9)

Westinghouse is submitting the following responses to the NRC open item (OI) on Chapter 9. These proposed open item response are submitted in support of the AP1000 Design Certification Amendment Application (Docket No. 52-006). The information included in these responses is generic and is expected to apply to all COL applications referencing the AP1000 Design Certification and the AP1000 Design Certification Amendment Application.

Enclosure 1 provides the response for the following proposed Open Item(s):

OI-SRP9.1.1-SRSB-08

Questions or requests for additional information related to the content and preparation of this response 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,

Robert Sisk, Manager
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/Enclosure

1. Response to Proposed Open Item (Chapter 9)

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

AP1000 Response to Proposed Open Item (Chapter 9)

AP1000 TECHNICAL REPORT REVIEW

Response to Open Item (OI)

RAI Response Number: OI-SRP9.1.1-SRSB-08
Revision: 0

Question: Spent Fuel Criticality Analysis

Based on the review of the TR-65 (Rev. 2) criticality analysis methodology and its application, the NRC staff questioned the applicant's burnup credit assumption that a 5% reactivity uncertainty penalty included the effects of missing nuclide data on the computational biases and uncertainties. This issue was raised in RAI-SRP9.1.1-SRSB-08.

In response to this 5% burnup uncertainty concern by the NRC, the applicant's September 16, 2009 letter described a loading pattern restriction on the Region 2 racks and the applicant's plan to submit a simplified analysis that does not require burnup credit (or which will remove or preclude the need for using burnup credit). This plan will not require any changes to the physical rack design as presented in TR-65. Evaluation of this restricted loading pattern, corresponding analyses, and Technical Specification changes related to this restricted loading pattern are tracked by **OI-SRP9.1.1-SRSB-08**.

Westinghouse Response:

This SER Open Item (OI) response completes the three tasks noted below:

- 1) It clarifies Westinghouse's intent to retain and license a full-capacity spent fuel pool. This clarification is based on a criticality analysis that meets the requirements of both 10 CFR 50.68, and the current guidelines established by the NRC, regarding how to account for burnup uncertainties. The Westinghouse response, technical approach, and revised criticality analysis (i.e. APP-GW-GLR-029, Rev. 2 (*former TR-65 series*)) to satisfactorily address the NRC concerns regarding the 5% burnup credit assumption noted above, are stated in the response to RAI-SRP9.1.1-SRSB-08 (Reference 1). The DCD changes describing the full-capacity spent fuel pool (SFP) were submitted in response to RAI-SRP9.1.1-SRSB-05 (Reference 4). These two RAIs and the supporting criticality analysis are requested to be approved by the NRC for use in the pending AP10000 DCD amendment.
- 2) It retracts the Westinghouse proposal noted in the September 16, 2009 letter (Reference 2) that suggested a restricted loading pattern (i.e. checkerboard pattern) would be pursued as the primary criticality safety basis for the SFP. That letter proposed to submit an alternate conservative SFP criticality analysis that takes no credit for fuel depletion or burnup. This checkerboard pattern would have imposed an adverse loading restriction on the Region 2 racks by reducing the spent fuel storage capacity by over 300 cells. Westinghouse chose not to exercise this proposal and did not describe or submit details of the checkerboard pattern or analysis to NRC.

AP1000 TECHNICAL REPORT REVIEW

Response to Open Item (OI)

- 3) It explicitly requests NRC to evaluate, review, and approve the backup checkerboard pattern and criticality analysis in calendar year 2010 to support the potential future use of this restricted loading pattern for the AP1000 SFP. This backup approach uses a new methodology that meets 10 CFR 50.68, does not use or reference WCAP 14416-NP-A, and does not credit soluble boron or fuel assembly burnup for subcriticality control in the Region 2 spent fuel racks. This backup checkerboard approach and criticality analysis is described in Westinghouse calculation APP-FS02-N1C-003, Rev. 0 (Reference 3). A proprietary version of this calculation is being submitted by separate letter to the NRC for review and audit, as applicable.

Westinghouse considers this checkerboard approach to be a proactive contingency for potential future use and operational flexibility of the AP1000 SFP if more restrictive decisions or guidelines regarding burnup credit uncertainties are imposed by the NRC in the future during the AP1000 rulemaking process. The intent of submitting this checkerboard pattern for approval is to provide a contingency for use by Westinghouse and the NRC that confirms the AP1000 SFP design remains safe and licensable relative to nuclear criticality.

Reference(s):

- 1) Westinghouse Letter DCP/NRC_002735, 1/8/10, re: response to RAI-SRP9.1.1-SRSB-08
- 2) Westinghouse Letter DCP/NRC_002619, 9/16/09, re: alternate restricted loading pattern for spent fuel pool to show 10 CFR 50.68 compliance
- 3) APP-FS02-N1C-003, Rev. 0, January 2009, "AP1000 Spent Fuel Pool Criticality Analysis without Credit for Soluble Boron or Assembly Burnup" (Proprietary)
- 4) Westinghouse Letter DCP/NRC_002511, 5/29/09, re: response to RAI -SRP9.1.1-SRSB-05 (contains DCD markups that support criticality analysis for full-capacity SFP loading)

Design Control Document (DCD) Revision:

The DCD changes describing the full-capacity SFP are identified in the response to RAI-SRP9.1.1-SRSB-05 (Reference 4). These DCD changes remain applicable to this response.

If the backup restricted-loading checkerboard pattern and criticality analysis are needed for use in the future, appropriate DCD changes, ISG-11 notifications, and applicable processes will be completed and submitted to the NRC at that time.

PRA Revision: None.

Technical Report (TR) Revision: None.