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Your ref: Docket No. 52-006
Our ref: DCP_NRC_002540

June 30, 2009

Subject: AP1000 Response to Request for Additional Information (SRP 3)

Westinghouse is submitting a response to the NRC request for additional information (RAI) on SRP Section 3. This RAI response is submitted in support of the AP1000 Design Certification Amendment Application (Docket No. 52-006). The information included in this response 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 RAI(s):

RAI-SRP3.6.4-EMB2-01 R3

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,

John DeBlasio

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

/Enclosure

1. Response to Request for Additional Information on SRP Section 3

*Dole 3
NRC*

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ENCLOSURE 1

Response to Request for Additional Information on SRP Section 3

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

RAI Response Number: RAI-SRP3.6.4-EMB2-01
Revision: 3

Question:

AP1000 DCD Revision 15, Section 3.6.4.1 identified a COL Information Item 3.6-1 which required the COL applicants referencing the AP1000 certified design to complete the final pipe whip restraint design and to address as-built reconciliation of the pipe break hazards analysis in accordance with the criteria outlined in subsection 3.6.1.3.2 and 3.6.2.5. In APP-GW-GLR-021, TR 6 and APP-GW-GLR-074, TR 7, Westinghouse proposed to modify the COL Information Item and provided a pipe break hazards analysis report for staff's review. Westinghouse stated that the report addresses and documents, on a generic basis, design activities required to complete COL Information Item in Section 3.6.4.1 in the AP 1000 DCD. Westinghouse further stated that it is expected that when the NRC review of TR 7 is complete, the included activities to address the COL Information Item in Section 3.6.4.1 will be considered complete for COL applicants referencing the AP 1000 Design Certification. On the basis of its review of TR 7, the staff found that there are numerous areas in the report are incomplete (e.g., ASME Class 1 piping fatigue evaluation, the complete design of the jet shields and pipe whip restraints, use of seismic response spectrum, etc.). The staff therefore, determined that the pipe break analysis of TR 7 can not be considered complete and the proposed revision to the COL Information Item 3.6-1 concerning the COL applicant's responsibility is not acceptable.

In a letter dated January 14, 2008, Westinghouse proposed to revise AP1000 DCD Revision 16, Section 3.6.4.1 to address NRC staff's comments on the completeness of TR 7. Westinghouse stated that a combined License (COL) holder referencing the AP1000 design will complete the pipe whip restraint design and complete an as-designed pipe break hazards analysis in accordance with the criteria outlined in subsection 3.6.1.3.2 and 3.6.2.5. The as-designed pipe rupture hazards analysis including break locations based on as-designed pipe analysis will be documented in an as-designed Pipe Rupture Hazards Analysis Report. The applicant also stated that the final design for these activities will be completed prior to fabrication and installation of the piping and connected components. Furthermore, the applicant stated that the as-built reconciliation of the pipe break hazards analysis in accordance with the criteria outlined in subsection 3.6.1.3.2 and 3.6.2.5 will be completed prior to fuel load. The same statement was also included in APP-GW-GLR-134, Revision 3, "AP1000 DCD Impacts to Support COLA Standardization," dated January 14, 2008. Based on its review of the information currently available in DCD Revision 16 and in APP-GW-GLR-134 Revision 4, the staff determined that the following additional information concerning the acceptability of the proposed COL Holder Item is needed:

- a. The staff maintains that the pipe break hazards analysis report of TR 7 is incomplete. RG 1.206 C.III.4.3 allows the applicant to propose an alternative the COL Information Item that can not be resolved completely before the issuance of a license. It requires the applicant to provide sufficient information to justify why that item can not be completed



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before the issuance of a license. Furthermore, it states that the applicant should provide sufficient information on this item to support the NRC licensing decision and also to propose a method for ensuring the final closure of the item including implementation schedules to allow the coordination of activities with the NRC construction inspection program following issuance of the COL. The current DCD and APP-GW-GLR-134 do not cover the level of detail described in RG 1.206 C.III.4.3. Westinghouse is requested to propose an alternative along with the described justification including implementation schedules to allow the coordination of activities with the NRC construction inspection program.

- b. In some of the DCD Tier I tables of System Based Design Description and ITAAC, the applicant includes an acceptance criteria which states that for the as-built piping, a pipe break evaluation report exists and concludes that protection from the dynamic effects of a line break is provided. It should be noted that the pipe break hazards analysis report is required for all the piping systems (with the exception of LBB piping) that are within the scope of SRP 3.6.2. The staff's concern is that the current AP1000 system based ITAAC tables do not reflect that. Westinghouse is requested to address how the system based ITAAC approach addresses all the piping systems which are within the scope of SRP 3.6.2 and are required to be included in a pipe break analysis performed in accordance with the criteria outlined in subsection 3.6.1.3.2 and 3.6.2.5.

Westinghouse Response:

| Revisions 1, 2 and 3 of this response are prepared in response to NRC comments.

- a.) Westinghouse is performing piping analysis as part of the piping DAC review. This analysis will provide results that will be used to determine the intermediate pipe break locations (if any) in the risk significant lines. The information to support the determination of intermediate pipe break locations is available at the time of the piping DAC review for the risk significant lines. The piping analysis includes the all-soils response spectra. Some of the representative pipe whip restraint and impingement shield designs will also be available as part of the pipe rupture hazard evaluation. Westinghouse will provide an as-designed pipe rupture hazards analysis including break locations. The as-designed pipe rupture hazards analysis will be documented in an as-designed Pipe Rupture Hazards Analysis Report.
- b.) The Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) included in Tier 1 of the AP1000 DCD are intended to provide the NRC staff a means to support their 10 CFR 52.103g determination that it is acceptable to load fuel upon completion of the construction of an AP1000. These ITAAC are not intended to supplement, replace, or supersede design requirements or commitments in the design control document. The



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scope and definition of AP1000 ITAAC were evaluated, reviewed, and accepted during the Design Certification review. There have been no changes to the AP1000 design or NRC regulations that would permit or require reconsideration of the AP1000 ITAAC related to pipe break hazard.

Final Safety Analysis Reports included in COL applications referencing the AP1000 incorporate Subsections 3.6.1 and 3.6.2 of the AP1000 DCD by reference. Criteria and requirements included in Subsections 3.6.1 and 3.6.2 provide sufficient assurance that a pipe break analysis in accordance with the criteria outlined in Subsection 3.6.1.3.2 and 3.6.2.5 is prepared. The ITAAC tables in the AP1000 DCD are system-based and Westinghouse has specifically included a pipe break evaluation report for four systems (RCS, PXS, SGS, and RNS). Westinghouse, however, generates a single pipe rupture hazard evaluation report that addresses all high energy lines, and applicable moderate energy lines, for all systems. The single report addresses all of the piping systems which are within the scope of SRP 3.6.2 and are required to be included in a pipe break analysis performed in accordance with the criteria outlined in subsection 3.6.1.3.2 and 3.6.2.5. The report addresses through wall cracks in moderate energy piping such as environmental, spray, subcompartment pressurization and flooding. The as-designed pipe break evaluation report is generic and applies to all COL applications referencing the AP1000 Design Certification

Subsection 3.6.4.1 contains a COL holder requirement for an as-built pipe break hazard analysis. Revision 1 of the response to RAI-SRP3.6.2-EMB2-01 provides a proposed revision to Subsections 3.6.2.5 and 3.6.4.1 to include the requirement for an as-designed pipe break hazard analysis. This analysis will be based on pipe analyses supporting the piping DAC review. Revision 2 of the response to RAI-SRP3.6.2-EMB2-01 modifies the DCD revision to address NRC comments. Revision 3 of the response to RAI-SRP3.6.2-EMB2-01 provides a revision to the COL holder requirement of performing an as-designed pipe rupture hazard analysis. The as-designed pipe rupture hazard evaluation is to be completed in time to support the Advance SER with no open items. The as-designed pipe rupture hazard evaluation report will include analysis of both high energy and moderate energy piping. The report will identify all (if any) intermediate break locations, and identify potential targets and locations where pipe whip restraints and jet shields are required due to dynamic effects in high energy piping. It will address flooding, subcompartment pressurization, environmental, and spray effects due to through wall cracks in moderate energy piping. A plant operability assessment will also be performed in the evaluation. The design of some of the required pipe whip restraints and jet shield designs will be included in the report, however not all of the designs are expected to be complete in time to support the Advance SER with no open items. The COL holder requirement is revised to reflect the need for completion of the pipe whip restraint and jet shield designs, as specified in the as-designed pipe rupture hazards evaluation report.



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Design Control Document (DCD) Revision:

None

PRA Revision:

None

Technical Report (TR) Revision:

None



Westinghouse