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Your ref: Docket No. 52-006 Our ref: DCP NRC 002852

April 16, 2010

Subject: AP1000 Response to Proposed Open Item (Chapter 3)

Westinghouse is submitting the following responses to the NRC open item (OI) on Chapter 3. These proposed open item responses 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-SRP3.6.2-EMB2-01 R2

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 Licensing and Customer Interface Regulatory Affairs and Standardization

/Enclosure

1. Response to Proposed Open Item (Chapter 3)

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cc:	D. Jaffe	-	U.S. NRC	1]	E
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	R. Kitchen	-	Progress Energy	1]	E
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ENCLOSURE 1

AP1000 Response to Proposed Open Item (Chapter 3)

Response to SER Open Item (OI)

OI Response Number: Revision: 2 OI-SRP3.6.2-EMB2-01

Question:

In DCD Revision 15, the applicant had included COL Information Item 3.6-1, which instructed the COL applicant to complete the pipe break hazard analysis. DCD Revision 15 Sections 3.6.1 and 3.6.2 provided all the design criteria that the COL information item would be demonstrating. In DCD Revisions 16 and 17 the applicant proposed to eliminate this COL information item. In order to support the removal of this COL information item from the DCD, the applicant provided a pipe break hazard analysis report. The staff determined that this report was incomplete and did not address all the information that the COL Information Item 3.6-1 specified. The complete staff evaluation of this proposed change is addressed in Section 3.6.2 of this SER.

As described in Section 3.6.2 of this SER, the applicant responded to RAI-SRP3.6.2-EMB2-01, in letters dated June 20, 2008 (ADAMS Accession Number ML081780176), August 15, 2008 (ADAMS Accession Number ML082330096), December 5, 2008 (ADAMS Accession Number ML083440071), June 30, 2009 (ADAMS Accession Number ML091870126 and ML091870127) and July 22, 2009 (ADAMS Accession Number ML092050157). In its latest response, the applicant stated that the pipe break hazard analysis report will be completed and available for the staff's review by December 31, 2009. The staff cannot determine that the piping design in the AP1000 meets the relevant requirements of 10 CFR Part 50, Appendix A, GDC 2, "Design Bases for Protection Against Natural Phenomena"; and GDC 4, "Environmental and Dynamic Effects Design Bases," until the pipe break hazard analysis report is completed. Therefore, the staff concerns related to the proposed deletion of COL Information Item 3.6-1, "Pipe Break Hazard Analysis," is still unresolved. This concern is identified as **Open Item OI-SRP3.6.2-EMB2-01**.

References:

- 1. ADAMS "Chapter 3 SER," ML092150664.
- 2. ADAMS "RAI-SRP3.6.2-EMB2-01, Rev. 4," ML092050157.

Westinghouse Response:

Revision 2:

This OI response is revised to remove the phrase "following an as-built reconciliation" from the Design Commitment in the markup provided for DCD Tier 1, Section 3.3 and Table 3.3-6 in response to NRC comments.



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Response to SER Open Item (OI)

Revision 1:

This OI response is revised to address NRC comments on the Rev. 0 response. A roadmap for closure of DAC is included in Chapter 14 (Section 14.3A) of the DCD (incorporated via OI-SRP3.12-EMB-4, Rev. 1). The as-designed piping analysis and as-designed pipe rupture hazards analysis COL information items may be closed post design certification in accordance with the DAC closure process options outlined in Appendix 14.3A and in RG 1.215. NEI 08-01 is no longer referenced in this OI response as the basis for closure of DAC.

Tier 1, Table 3.3-4 of the DCD is deleted, and the subsequent ITAAC in Table 3.3-6, line item 8 is reworded accordingly. The as-built pipe rupture hazards analysis report will conclude that the systems, structures and components identified as essential targets can withstand the effects of postulated pipe rupture without the loss of required safety function.

Additionally, Tier 1, Section 3.3 of the DCD is modified to be consistent with changes made to Tier 1, Table 3.3-6 in Rev. 0 of this OI response.

Revision 0: (with Rev 1 changes incorporated)

A meeting was held on 1/27/10 between the NRC and WEC at the Westinghouse Twinbrook Office to discuss the licensing approach for the as-designed pipe rupture hazards evaluation to be implemented for the AP1000 Design Certification Amendment (DCA). At the meeting, WEC indicated that it would not be able to complete the as-designed pipe rupture hazards evaluation to support the DCA schedule as stated in the Rev. 4 response RAI-SRP3.6.2-EMB2-01 (Reference 2).

In Reference 2, WEC indicated that the as-designed pipe rupture hazards evaluation would be completed for the DCA and that the COL applicant would complete the design of the pipe whip restraints and jet shields. At the 1/27/10 meeting, WEC proposed that the full scope of the as-designed pipe rupture hazards evaluation be addressed in COL information item 3.6-1. The revised COL information item 3.6-1 will state that COL applicants referencing the AP1000 design will complete the as-designed pipe rupture hazards evaluation according to the criteria outlined in DCD subsections 3.6.1.3.2 and 3.6.2.5. The COL information item may be addressed by the COL applicant in a manner that complies with NRC guidance provided in Regulatory Guide 1.215, and outlined in Appendix 14.3A of the DCD.

Westinghouse will continue to work towards completion of the as-designed pipe rupture hazards evaluation, and will submit a licensing topical report to the staff documenting completion of the effort and referencing the applicable design documents. The report would support closure of the COL information item for the reference standard plant. WEC may request that the NRC audit the design documents and document findings in a safety evaluation which, in conjunction with the inspection reports written on the R-COLA, would become a reference for documenting



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Response to SER Open Item (OI)

closure of the COL information item for subsequent COL applicants under the concept of "one issue, one review, one position," in NRC guidance.

This approach was generally agreed upon between WEC and the NRC at the meeting on 1/27/10, and it was decided that the COL information item in the DCD, in conjunction with a license condition and design ITAAC provided in the COLA, would establish the basis for closure of the as-designed pipe rupture hazards evaluation.

With the full scope of the as-designed pipe rupture hazards evaluation being addressed as COL Information Item 3.6-1, it is no longer an open item for the Design Certification Amendment. Westinghouse proposes that the SER Open Item OI-SRP3.6.2-EMB2-01 be considered closed.

Additionally, Tier 1 Table 3.3-6 is revised to include the full scope of the pipe rupture hazards evaluation in the ITAAC, rather than limiting the scope to dynamic effects of pipe rupture. This will allow the scope of the as-built ITAAC to match the scope of the COL information item for the as-designed evaluation.

Design Control Document (DCD) Revision:

The OI-SRP3.12-EMB-4, Rev. 1 response contains the DCD markups to Section 14.3 of the DCD.

Tier 2, Subsection 3.6.4.1 of the DCD is modified as follows (includes Rev. 0 and Rev. 1 changes):

3.6.4.1 Pipe Break Hazard Analysis

The Combined License information requested in this subsection has been partially addressed in APP-GW GLR-021 (Reference 14) and APP GW GLR 074 (Reference 16), and the applicable changes are incorporated into the DCD. Additional work is required by the Combined License holder applicant to address the aspects of the Combined License information requested in this subsection as delineated in the two-following paragraphs:

The pipe rupture hazard evaluation (for pipe whip and jet impingement) was performed for the AP1000 plant. The purpose of this evaluation was to identify potential targets and determine the method of protection to be used for safety related targets located in the vicinity of postulated high energy pipe breaks at terminal ends. In addition, the room locations of pipe whip restraints were identified.



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Response to SER Open Item (OI)

As explained in APP-GW-GLR-021, which discusses AP1000 As-Built COL Information Items, the timing of the reconciliation of the as-built pipe break hazard analysis is such that the reconciliation cannot be provided by an applicant for a COL. This reconciliation will be done prior to operation of the plant. An as designed pipe rupture hazard analysis based on the asdesigned pipe analysis is prepared to update and validate the information provided in APP-GW-GLR-074 (Reference 16).

The following words represent the original Combined License Information Item commitment, which has been addressed as discussed above:

Combined License applicants referencing the AP1000 certified design will complete the final pipe whip restraint design and address as-built reconciliation of the pipe break hazards analysis in accordance with the criteria outlined in subsections 3.6.1.3.2 and 3.6.2.5. The as-built pipe rupture hazard analysis will be documented in an as-built Pipe Rupture Hazards Analysis Report.

After a Combined License is issued, the The following activityies will be completed by the COL holder applicant:

Combined License applicants referencing the AP1000 certified design will complete the asdesigned pipe rupture hazards evaluation and make design information available for NRC review. The completed as-designed pipe rupture hazards evaluation will be in accordance with the criteria outlined in subsections 3.6.1.3.2 and 3.6.2.5. Systems, structures and components identified to be essential targets protected by associated mitigation features (Reference is Table 3.6-3) will be confirmed as part of the evaluation, and updated information will be provided as appropriate.

A pipe rupture hazards analysis is part of the piping design. The evaluation will be performed for high and moderate energy piping to confirm the protection of systems, structures and components which are required to be functional during and following a design basis event. The locations of the postulated ruptures and essential targets will be established and required pipe whip restraints and jet shield designs will be included. The report will address environmental and flooding effects of ruptures in high and moderate energy piping. The as-designed pipe rupture hazards evaluation is prepared on a generic basis to address COL applications referencing the AP1000 design.design of pipe whip restraints and jet shields at all locations specified in the as-designed pipe rupture hazards evaluation.

These design efforts to be completed by the COL holder will be based on the information provided in the as designed pipe rupture hazard evaluation. The as designed pipe rupture hazard evaluation, including identification of locations where pipe whip restraints and jet shields are required, is prepared on a generic basis to address COL applications referencing the AP1000 Design Certification.

Westinghouse

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Response to SER Open Item (OI)

The final pipe whip restraint and jet shield design includes the properties and characteristics of procured components connected to the piping, components, and walls at identified break and target locations. The final design will be completed prior to fabrication and installation of the piping and connected components. The as-built reconciliation of the pipe rupture hazards evaluation whip restraint and jet shield design in accordance with the criteria outlined in subsections 3.6.1.3.2 and 3.6.2.5 will be completed prior to fuel load.

Tier 2, Subsection 3.6.5 of the DCD is modified as follows:

16.APP GW GLR 074, "Pipe Break Hazards Analysis," Westinghouse Electric Company LLC.

Tier 1, Section 3.3, Item 8 of the DCD is modified as follows: (includes Rev. 0, 1 and 2 changes):

Note - the phrase "following an as-built reconciliation" added in the Revision 1 response has been removed below.

8. Equipment Systems, structures and components labeled-identified as essential targets in Table 3.3-4 and located in rooms identified in Table 3.3-4 are protected from the dynamic and environmental effects of postulated pipe breaksruptures.

Tier 1, Table 3.3-4 of the DCD is DELETED,

Tier 1, Table 3.3-6, Line Item 8 of the DCD is modified as follows (includes Rev. 0, 1 and 2 changes):

Note - the phrase "following an as-built reconciliation" added in the Revision 1 response has been removed from the Design Commitment section below.



Response to SER Open Item (OI)

Table 3.3-6 Inspections, Tests, Analyses, and Acceptance Criteria					
Design Commitment	Inspections, Tests, Analyses	Acceptance Criteria			
8. Equipment Systems, structures and components labeled-identified as essential targets in Table 3.3.4 and located in rooms identified in Table 3.3.4 are protected from the dynamic and environmental effects of postulated pipe breaksruptures.	Following as-built reconciliation, Aan inspection will be performed of the as-built high and moderate energy pipe break-rupture pipe whip restraintsmitigation features for systems, located in rooms identified in Table 3.3-4.structures and components identified as essential targets.	An as-built Pipe Rupture Hazard Analysis Report exists and concludes that equipment systems, structures and components labeled-identified as essential targets in Table 3.3 4 and located in rooms identified in Table 3.3 4 can withstand the effects of postulated pipe rupture without loss of required safety function.			

PRA Revision: None

Technical Report (TR) Revision: None

