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Your ref: Docket No. 52-006
Our ref: DCP/NRC2192

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Subject: AP1000 Response to Request for Additional Information (SRP3.6.1)

Westinghouse is submitting a response to the NRC request for additional information (RAI) on SRP Section 3.6.1. This RAI response is submitted in support of the AP1000 Design Certification Amendment Application (Docket No. 52-006). The information included in the response is generic and is expected to apply to all COL applications referencing the AP1000 Design Certification and the AP1000 Design Certification Amendment Application.

A response is provided for RAI-SRP3.6.1-SBPA-01 and -02, as sent in an email from Mike Miernicki to Sam Adams dated May 29, 2008. This response completes all requests received to date for SRP Section 3.6.1.

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,

A handwritten signature in black ink that reads "Donald A. Sisk for".

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

/Enclosure

1. Response to Request for Additional Information on SRP Section 3.6.1

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

Response to Request for Additional Information on SRP Section 3.6.1

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

RAI Response Number: RAI-SRP3.6.1-SBPA-01
Revision: 0

Question:

In DCD Section 3.6.1.1, "Design Basis," Paragraph J, the following secondary, non safety related components are listed as those to be used to mitigate postulated line ruptures:

- turbine control and stop valves,
- turbine interceptor and reheat stop valves, and
- turbine bypass (steam dump) valves.

In DCD Section 3.6.1.3.3 (second to last paragraph), page 3.6-11, the following secondary, non safety related components are listed as those to be used to mitigate postulated line ruptures:

- turbine stop valves,
- moisture separator reheater stop valves, and
- turbine bypass valves.

Provide clarification as to what secondary, non safety related components are to be used to mitigate postulated line ruptures.

Westinghouse Response:

Westinghouse acknowledges the inconsistency in nonsafety-related valve identification within DCD Section 3.6. Extent of condition review also observed this inconsistency within DCD Section 10.3.

The nonsafety-related valves used to mitigate postulated line ruptures, given the failure of no more than one Main Steam Isolation Valve (MSIV) are:

- Turbine Control and Stop Valves
- Turbine Bypass Valves
- Moisture Separator Reheat Supply Steam Control Valves

These valves are identified in the AP1000 Technical Specification Bases (DCD Section 16.1, B 3.7.2), "The non-safety related turbine stop or control valves, in combination with the turbine bypass, and moisture separator reheat supply steam control valves, are assumed as a backup to isolate the steam flow path given a single failure of an MSIV."

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

Design Control Document (DCD) Revision:

Revise AP1000 DCD, Revision 16, Subsections 3.6.1.1, 3.6.1.3.3, and 10.3.1.1 as follows:

3.6.1.1 Design Basis

- J. Safety-related systems and components are used to mitigate the effects of postulated pipe ruptures. In addition, the turbine control and stop, ~~turbine intercepter and reheat stop~~ moisture separator reheat supply steam control, and turbine bypass (steam dump) valves (which are not safety-related) are credited in single failure analyses to mitigate postulated steam line ruptures.

3.6.1.3.3 Specific Protection Considerations

For those cases in which the rupture of the main steam or feedwater piping inside containment is the postulated initiating event the turbine control, turbine stop, moisture separator ~~reheater stop~~ reheat supply steam control, and turbine bypass valves and to a limited extent, the control systems for the turbine stop and feedwater control valves (which are nonsafety-related equipment) are credited in single failure analysis to mitigate the event. This equipment is not protected from pipe ruptures in the turbine building because the postulated pipe rupture for which it provides protection is inside containment. The assumed single active failure for this analysis is the function of the safety-related valve that would normally isolate the piping. This isolation function is addressed in more detail in Chapter 10.

10.3.1.1 Safety Design Basis

- The nonsafety-related turbine stop, turbine control, turbine bypass, and moisture separator ~~reheater stop~~ reheat supply steam control valves are credited in a single failure analysis to mitigate the event for those cases in which the rupture of the main steam or feedwater piping inside containment is the postulated initiating event.

PRA Revision:

None

Technical Report (TR) Revision:

None

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

RAI Response Number: RAI-SRP3.6.1-SBPA-02
Revision: 0

Question:

In DCD Section 3.6.1.3.3, the applicant proposed justification for revising this section in Westinghouse Technical Report APP-GW-GLR-125, Revision 0, May 2007 (TR-125). TR-125 stated that the revision to DCD Section 3.6.1.3.3 is the complete removal of the second bullet item.

However, Revision 16 of the DCD, the first sentence of the second bullet item remains (e.g., "Instrumentation required to function following a pipe rupture is protected.").

Provide justification for the deletion and resolve the differences between the Technical Report and Revision 16 of the DCD.

Westinghouse Response:

Westinghouse recognizes that the content of technical report APP-GW-GLR-125, Revision 0, Section 5.0 (DCD Markup) does not reflect the content of APP-GW-GL-700, Revision 16, Subsection 3.6.1.3.3 (Specific Protection Considerations).

As stated in the APP-GW-GLR-125, Rev. 0, Section 2.0:

"Four main steam line steam generator pressure elements (SGS-031, SGS-033, SGS-035, and SGS-037) and four startup feedwater flow elements (SGS-055A/B and SGS-056A/B) are located outside containment, outside the main steam isolation valve (MSIV) compartment, and outside the Lower Annulus Valve Room. These instruments do not have to be qualified for a harsh environment since they are outside containment, the MSIV compartment, and the Lower Annulus Valve Room. The sensing lines for both the pressure elements and the flow elements are run outside of these rooms."

In developing the markup for APP-GW-GLR-125 Section 5.0, the author incorrectly deleted the second bullet of DCD Subsection 3.6.1.3.3 in its entirety. When preparing the DCD text, the bullet was not completely removed since this consideration is applicable to all safety-related instrumentation located in a harsh environment.

Therefore, it is concluded that the removal of wording specific to the installation of safety-related instrumentation in the MSIV rooms (i.e., outside containment) is justified per the technical report.

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

In accordance with 10 CFR 50 Appendix A, General Design Criteria 4:

“... [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. These ... [SSCs] ... shall be appropriately protected against dynamic effects, including the effects of missiles, pipe whipping, and discharging fluids, that may result from equipment failures and from events and conditions outside the nuclear power unit.”

Therefore, by deleting the first sentence of the affected bullet, the content of the technical report does not adequately comply with regulatory expectations for safety-related instrumentation performance criteria following a pipe break since provisions for the protection of required instrumentation following a pipe rupture were removed from the DCD Chapter 3.6 markup.

In conclusion, the AP1000 DCD correctly represents specific protection considerations associated with the installation of safety-related instrumentation, in accordance with General Design Criterion 4 (10 CFR 50 Appendix A). The revision to AP1000 technical report APP-GW-GLR-125, Revision 0, Section 5.0 is shown below for resolution of this item.

Design Control Document (DCD) Revision:

None

PRA Revision:

None

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

Technical Report (TR) Revision:

Revise APP-GW-GLR-125 (TR-125) as follows:

5.0 DCD MARKUP

3.6.1.3.3 *Specific Protection Considerations*

The analysis of the consequences of pipe breaks, through-wall cracks, and leakage cracks uses the following criteria.

- High-energy containment penetrations are subject to special protection mechanisms. Restraints are provided to maintain the operability of the isolation valves and the integrity of the penetration due to a break in the safety-related and nonsafety piping beyond the restraint if required. These restraints are located as close as practicable to the containment isolation valves associated with these penetrations.
- **Instrumentation required to function following a pipe rupture is protected.** ~~In the event of a high energy line break outside containment, the only safety related instrumentation that could be affected is the pressure and flow instrumentation in the main steam isolation valve (MSIV) compartment. This instrumentation is qualified for the environmental conditions resulting from a 1 square foot break from either main steam or feedwater line in the MSIV compartment as required in order to perform its safety functions.~~