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Your ref: Docket No. 52-006
Our ref: DCP/NRC2194

July 3, 2008

Subject: AP1000 Response to Request for Additional Information (SRP3.4.1)

Westinghouse is submitting a response to the NRC request for additional information (RAI) on SRP Section 3.4.1. 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-SRP3.4.1-SBPA-01 through -06, as sent in an email from Mike Miernicki to Sam Adams dated April 15, 2008. This response completes all requests received to date for SRP Section 3.4.1.

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,

for

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

/Enclosure

1. Response to Request for Additional Information on SRP Section 3.4.1

D063
NRO

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

Response to Request for Additional Information on SRP Section 3.4.1

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

RAI Response Number: RAI-SRP3.4.1-SBPA-01
Revision: 0

Question:

In the AP1000 DCD Revision 16, Section 3.4.1.1.2, the applicant proposed to modify a statement to identify that two watertight doors on the two waste holdup tank compartments are needed to protect safe shutdown components from the effects of internal floods, and are provided to limit the consequences of failure on the spent fuel pit.

However, the applicant did not provide a justification for this change. Please address the following considerations to demonstrate compliance with GDC 4, "Environmental and Dynamic Effects Design Bases:"

1) identify the flood source(s) associated with the spent fuel pit flooding event and the potential flood volume;

2) provide the volume of a waste hold-up tank compartment; and

3) identify the safe shutdown components which are protected by these watertight doors, and provide the design criteria applied for the proper functioning of these doors in the internal flood events considered.

Westinghouse Response:

The text in this section was modified to reflect that the two watertight doors added during Rev. 16 of the DCD were **not** added to protect safe shutdown components from the effects of internal floods. These doors were added to provide additional defense-in-depth capability to retain spent fuel pool water within either a single waste holdup tank room or both waste holdup tank rooms to limit the consequences of a beyond design basis failure of the spent fuel pit.

The volume of a waste hold-up tank compartment is 51,900 gallons.

The watertight doors are **not** used to protect any safe shutdown components. These water tight doors were only added to support the beyond design basis accident capability. The watertight doors have been sized to accommodate a water pressure equivalent of 68'-0" of head. This is conservatively based on the elevation head between the maximum spent fuel pool water level and the finished floor elevation of the tank rooms. No credit is taken for the pool level being reduced due to the pool volume required to fill the room(s).

Design Control Document (DCD) Revision:
Revise DCD Section 3.4.1.1.2, third paragraph to improve clarity as follows:

The AP1000 minimizes ... floor. There are no watertight doors in the AP1000 used for internal flood protection because, as described in subsection 3.4.1.2.2, they are not needed to protect safe shutdown components from the effects of internal flooding. ~~The only exceptions are the watertight doors on the two waste holdup tank compartments. These doors are provided to limit the consequences of failure on the spent fuel pit.~~ The walls, floors, and penetrations are designed to withstand the maximum anticipated hydrodynamic loads associated with a pipe failure as described in Section 3.6. The two watertight doors on the waste holdup tank compartments limit the consequence of a failure on spent fuel pool water level.

PRA Revision:
None

Technical Report (TR) Revision:
None

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

RAI Response Number: RAI-SRP3.4.1-SBPA-02
Revision: 0

Question:

In DCD Section 3.4.1.2.2.2, the applicant modified a statement with changes underlined as follows: "With the worst crack location being the 6 inch line between the valves and the flow control orifices. This leak is not isolable from the *755,000* ~~800,000~~ gallon passive containment cooling system water storage tank above the valve room."

In NUREG-1793, Section 6.2.1.6 the staff concluded that a usable volume of 756,700 gallons existed (which is slightly more) for passive containment heat removal.

Clarify and resolve the apparent discrepancy of the volume of water in the PCS water storage tank.

Westinghouse Response:

Westinghouse agrees with the staff conclusion and the AP1000 PCS system usable PCS tank volume of 756,700 is appropriate. The indicated value will be corrected in the next version of the DCD. Therefore, the text will read...."This leak is not isolable from the 756,700 gallon passive containment cooling system water storage tank above the valve room."

Design Control Document (DCD) Revision:
Revise DCD Rev.16 Subsection 3.4.1.2.2.2 as follows:

PCS Valve Room (Elevation 284'-10")

This room contains three redundant safety-related valve trains for the passive containment cooling system water cooling subsystem. One train must open to provide the required containment cooling. The only source of flooding for this room is a through-wall crack in the passive containment cooling system piping. The worst crack location is in the 6 inch line between the valves and the flow control orifices. This leak is not isolable from the ~~755,000~~756,700 gallon passive containment cooling system water storage tank above the valve room. Flow is by gravity.

PRA Revision:
None

Technical Report (TR) Revision:
None

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

RAI Response Number: RAI-SRP3.4.1-SBPA-03
Revision: 0

Question:

In DCD Section 3.4.1.2.2.3, the applicant modified the following statement to read: "Water accumulation at elevation 100'-0"is minimized by floor drains to the annex building sump and by flow under the access doors to leading directly to the yard area."

This change eliminated reference to a previously credited flow path through the turbine building because the access door at the 100' elevation level has been eliminated from the design, as described in TR 105, APP-GW-GLN-105, "Building and Structure Configuration, Layout, and General Arrangement Design Updates."

Clarify the effect of eliminating this drainage pathway on the results of the internal flooding analysis and verify that it does not result in any increased water level buildup that would require further evaluation.

Westinghouse Response:

The elimination of the flow path to the turbine building at the 100'-0" level has been compensated with an increase in the egress door opening to Area 4 of the Annex Building to match the opening previously credited to the turbine building and using the same number of alternate pathways to accommodate the flood source as previously assumed. Therefore, the flood level has not been changed and remains the same provided in Rev. 15 of the DCD.

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)

RAI Response Number: RAI-SRP3.4.1-SBPA-04
Revision: 0

Question:

In DCD Section 3.4.1.2.2.3, the applicant modified the following statement to read: "Water accumulation at elevation 100'-0"is minimized by floor drains to the annex building sump and by flow under the access doors to leading directly to the yard area."

This change eliminated reference to a previously credited flow path through the turbine building because the access door at the 100' elevation level has been eliminated from the design, as described in TR 105, APP-GW-GLN-105, "Building and Structure Configuration, Layout, and General Arrangement Design Updates." However, in the next paragraph in the DCD, the applicant credits a drainage path through the turbine building for preventing water accumulation in battery rooms as stated below:

> "The non-Class 1E dc and UPS system (EDS) equipment with regulatory treatment of nonsafety-related systems important missions is located on elevation 100'-0" in separate battery rooms. Water in one of these rooms due to manual fire fighting in the room is collected by floor drains to the annex building sump *or flows to the turbine building under doors* or to the yard area through doors."

Clarify whether a drainage path through the turbine building remains in the flood analysis. If there is no longer a drainage path then clarify the effect of eliminating this drainage pathway on the results of the internal flooding analysis and verify that it does not result in any increased water level buildup that would require further evaluation.

Westinghouse Response:

This paragraph should have been updated consistent with the previous paragraph to reflect the elimination of the flow path to the turbine building at the 100'-0" level. This paragraph will be corrected to the following: "The non-Class 1E dc and UPS system (EDS) equipment with regulatory treatment of nonsafety-related systems important missions is located on elevation 100'-0" in separate battery rooms. Water in one of these rooms due to manual fire fighting in the room is collected by floor drains to the annex building sump and by flow under the access doors leading directly to the yard area."

Design Control Document (DCD) Revision:
Revise DCD Rev.16 Subsection 3.4.1.2.2.3 as follows:

The non-Class 1E dc and UPS system (EDS) equipment with regulatory treatment of nonsafety-related systems important missions is located on elevation 100′-0″ in separate battery rooms. Water in one of these rooms due to manual fire fighting in the room is collected by floor drains to the annex building sump and by flow under the access doors leading directly to the yard area.~~or flows to the turbine building under doors or to the yard area through doors.~~ This is not expected to affect functionality of equipment in the adjacent rooms.

PRA Revision:
None

Technical Report (TR) Revision:
None

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

RAI Response Number: RAI-SRP3.4.1-SBPA-05
Revision: 0

Question:

In TR 105, APP-GW-GLN-105, "Building and Structure Configuration, Layout, and General Arrangement Design Updates," Section 4.4, the applicant describes structural changes performed to the Auxiliary Building. Please confirm that the Auxiliary Building internal flooding analysis described in DCD Section 3.4.1.2.2.2 has been updated to reflect these changes and remains valid. Given that some of the proposed changes involve additional connections between the Annex Building and the Auxiliary Building, discuss how these changes affect the (Auxiliary Building) analysis with initiating events in the Annex Building.

Westinghouse Response:

The changes as described in Section 4.4 of the reference document have no impact on the internal flooding analysis as described in DCD Section 3.4.1.2.2.2 and remains valid. The proposed changes in connections between the Annex Building and Auxiliary Building do not have any impact on the Auxiliary Building flooding analysis with initiating events in the Annex Building because the connection points are above the elevation of the drainage paths credited for these events.

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)

RAI Response Number: RAI-SRP3.4.1-SBPA-06
Revision: 0

Question:

In DCD Section 3.4.1.2.2.2, Change 6, the applicant proposed to delete the discussion of the 150 gallon potable water storage (PWS) tank rupture in the main mechanical HVAC equipment rooms which drains to the turbine building via floor drains or to the annex building via flow under the doors. The staff evaluated this change and finds that the change does not affect the staff's conclusion documented in NUREG-1793 regarding this area of the Auxiliary Building.

However, since the PWS is no longer included in the scope of the certification, the staff determines that the COL applicant needs to confirm that this portion of the flooding analysis remains valid, as part of the interface requirements for the site-specific PWS. The staff requests the applicant to include an interface requirement to ensure site-specific potable water system designs ensure that the assumptions in the generic DCD regarding flooding protection in the Auxiliary Building are satisfied.

Westinghouse Response:

The PWS inside of the standard AP1000 plant is still included in the DCD and the Design Certification. The discussion of the PWS 150 gallon potable water storage tank rupture was inadvertently removed from the DCD. The text in this section relative to the potable water tank will be returned to the original design certification version in DCD Revision 15. Therefore, there is no impact on the internal flooding analysis.

Design Control Document (DCD) Revision:
Revise DCD Rev.16 Subsection 3.4.1.2.2.2 as follows:

Water from fire fighting, ~~or~~ postulated pipe or potable water storage tank (150 gallons) ruptures in the main mechanical HVAC equipment rooms drains to the turbine building via floor drains or to the annex building via flow under the doors. Therefore, no significant accumulation of water occurs in this room. Floor penetrations are sealed and a 6 inch platform is provided at the elevator and stairwell such that flooding in these rooms does not propagate to levels below.

PRA Revision:
None

Technical Report (TR) Revision:
None