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Your ref: Docket No. 52-006
Our ref: DCP_NRC_002777

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

The attached RAI response provides a generic AP1000 response to an RAI sent to South Carolina Electric and Gas for the COL application for Summer Units 2 and 3. This response confirms acceptable results of the evaluation of the impact of a tornado driven automobile missile at elevations greater than thirty feet above plant grade. This response is generic to all AP1000 applications and provides mark-ups for the AP100 Design Control Document.

Enclosure 1 provides the response for the following RAI(s):

RAI COL03.05.01.04-1

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, appearing to read "R. Sisk" with a stylized flourish.

Robert Sisk, Manager
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/Enclosure

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

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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 COL03.05.01.04-1
Revision: 0

Question:

In FSAR Section 3.5.1.4 (VCS SUP 3.5-2), the applicant states that a postulated automobile missile is considered for all elevations of Summer Units 2 and 3 facilities and not just limited to elevations up to and including 30 feet above grade. Since this is a change from the standard AP1000 DCD, please provide the following information:

- Identify all structures, systems, and components (SSCs) that are located on the exterior of the facilities (i.e., intakes, exhausts, vents, valves, piping, etc.) that are higher than 30 feet above grade and require tornado missile protection.
- Provide the location of these SSCs by building, elevation and General Arrangement Drawing.
- Delineate how these SSCs will be further protected against the postulated impact of a postulated automobile missile, without impairing the safety-related functions of these SSCs.
- Since this additional tornado missile protection has the potential of causing additional static and dynamic loads during a postulated seismic event, please provide a preliminary assessment on how these additional loads affect the seismic integrity of the facilities.

Westinghouse Response:

The following is the generic Westinghouse response to the Summer Units 2 and 3 RAI provided above.

NUREG 0800, for Subsection 3.5.1.4 and RG 1.76 recommends that the automobile tornado missile be considered up to 30 feet above all grade levels within a 1/2 mile of the plant structures. COL applications that reference the AP1000 design certification include sites that have grade elevations within a 1/2 mile of the plant structures higher than the plant grade elevation of 100 ft. The information in the DCD addresses an automobile impacting the auxiliary building or shield building at an elevation up to 30 feet above plant grade elevation of 100 ft. Westinghouse completed an evaluation of the impact of an automobile tornado missile to support the response from SCE&G for Summer Units 2 and 3 at elevations higher than 30 feet above design plant grade. This evaluation is generic and evaluates impact of a wind driven automobile tornado missile at all elevations of the auxiliary and shield buildings up to the junction of outer wall of the passive containment cooling water storage tank with the roof of the shield building, approximately Elevation 293 ft. This includes evaluation of impact of the automobile on the roof of auxiliary building. The evaluation summary report (TR-133) is documented in APP-GW-GLR-133 (Reference 1).

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

The evaluation of the response of the AP1000 structures to tornado missiles is part of the standard design of the AP1000 and is included in the review of the design certification design. As a result Westinghouse is revising the DCD to include applicability of the evaluation described above to the certified design. COL applications with postulated automobile tornado missiles at elevations as identified above do not require a departure from the standard AP1000 DCD.

- There are no structures, systems, and components (SSCs) located on the exterior of the AP1000 standard design facilities at any elevation that require protection from tornado missiles. The systems and components required to shut down the reactor, address transient conditions, and mitigate postulated accidents are protected by the reinforced concrete walls of the shield building and auxiliary building. Openings created by doors are on the East side of the Nuclear Island. The Annex building provides protection, and the roll-up door at the fuel handling area has no systems in the vicinity that are required for safe shutdown. The air-inlets in the shield building are smaller than the automobile, and therefore, it could not pass through the shield building. Temporary blockage of the air-inlet would not be an issue because of large number of them. Further, secondary missiles that could be potentially created at openings could not cause damage to systems required for safe shutdown due to proximity and low energy of the missile. The PCS ancillary water tank is located at ground level adjacent to the Northwest corner of the auxiliary building and provides water for use by the passive containment cooling system from 72 hours after actuation to 7 days after actuation. This tank must be protected from hurricane missiles; not tornado missiles. A tornado is a local event not a regional event and the plant can count on external resources such as back up power and additional water in the post 72 hour period.
- Systems and components located in the turbine building, annex building, radwaste building, diesel generator building, and associated with external tanks are not required to be protected from impact of tornado missiles. The plot plan for the AP1000 is provided in DCD figure 1.2-2 and shows the arrangement of the buildings.
- Plant specific design modifications to the AP1000 standard plant for tornado missile protection are not required for postulated automobile tornado missiles at all elevations of the auxiliary and shield buildings up to the junction of outer wall of the passive containment cooling water storage tank with the roof of the shield building, approximately Elevation 293 ft
- Evaluation of the postulated automobile missile has not resulted in additional tornado missile protection (enhancements) to the structures. Therefore, there are no additional static or dynamic loads imposed during a seismic event, with no affect on the seismic integrity of the facilities.

Reference

1. APP-GW-GLR-133, Summary of Automobile Missile 30' Above Grade, July 2007.

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

Design Control Document (DCD) Revision:

Revise the first bullet under Subsection 3.5.4.1 as follows:

- A massive high-kinetic-energy missile, which deforms on impact. It is assumed to be a 4000-pound automobile impacting the structure at normal incidence with a horizontal velocity of 105 mph or a vertical velocity of 74 mph. ~~This missile is considered at all plant elevations up to 30 feet above grade.~~ Grade elevations within half a mile of the plant may be higher than the plant grade elevation; the evaluation of the automobile missile is considered at plant elevations up to the elevation to the junction of outer wall of the passive containment cooling water storage tank with the roof of the shield building.

PRA Revision: None

Technical Report (TR) Revision: None