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Your ref: Docket No. 52-006
Our ref: DCP_NRC_002669

October 21, 2009

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 response 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-SRP3.7.2-SEB1-02

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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NRO

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ENCLOSURE 1

AP1000 Response to Proposed Open Item (Chapter 3)

AP1000 DESIGN CERTIFICATION REVIEW

Response to SER Open Item (RAI)

RAI Response Number: OI-SRP3.7.2-SEB1-02
Revision: 0

Question:

The radwaste building was evaluated for its potential collapse on the nuclear island, demonstrating that it would not impair the structural integrity of the nuclear island safety-related structures (see DCD Subsection 3.7.2.8.2, "Radwaste Building"). However, because of the addition of 3 liquid radwaste monitor tanks (see TR-116, Reference 2), which completely alters the structural dynamic characteristics of the building, it is not clear whether this conclusion is still valid. The staff reviewed the Westinghouse response to RAI-SRP3.7.2-SEB1-02, Revision 1, dated October 1, 2008 (ADAMS Accession Number ML082770219), and determined that it was not acceptable because the maximum kinetic energy calculated using Method 3 in DCD Subsection 3.7.2.8.2 (0.6E9 in-lb or 68E6 joules) far exceeded that of auto missile (2E7 in-lb or 2.26E6 joules) and water tank missile (3E5 in-lb or 3.4E4 joules) claimed in the response. The staff's calculation was based on the assumptions that the mass of the radwaste building equals the mass of a single water tank (i.e., 144,781 lbs or 65,673 kg) and the velocity is 150 fps (105 mph or 168 km per hour).

Westinghouse Response:

A single liquid storage tank equal to 144,781 lbs traveling at 105 mph is not a credible event since the tanks are at the foundation level (plant grade, Elevation 100') near the Auxiliary building protected by the Radwaste building. If the tanks became a missile it would not be possible for the tanks to reach the velocity of 150 fps prior to impact on the Nuclear Island since, per Regulatory Guide 1.76, the trajectories must be unobstructed by the presence of any obstacles. Further, it is not considered a reasonable probability of becoming airborne within the tornado wind field located at the radius of the maximum circumferential wind speeds.

Regulator Guide 1.76 defines design basis tornado missiles. These missiles were defined from a spectrum of tornado missiles considered common objects about a nuclear plant site that have a reasonable probability of becoming airborne within the wind field. Tanks are common mechanical equipment that can be found on the plant site not housed/housed within a structure. However, tanks were not defined as the design basis massive missile of high kinetic energy that deforms on impact in Regulatory Guide 1.76. The automobile was chosen since it is common on a plant site, and could reach the high velocity of 150 fps. Further, during AP1000 Design Certification there were no additional requirements imposed related to tornado missiles that included tanks.

Therefore, the addition of three liquid radwaste monitor tanks do not impair the structural integrity of the adjacent nuclear island (NI) structures during an extreme environmental event (tornado) since they can not reach high velocities near the NI during such an event, their mass

decreases greatly due to the loss of the liquid if they do become a missile, and their impact energy reduces due to deformation of the tank.

In the AP1000 DCD Section 3.3.2.3 it is stated: "The Radwaste Building is a small steel-frame building. If it were to collapse in the tornado, it would not impair the integrity of the reinforced concrete nuclear island."

The three liquid Radwaste monitor tanks do not change the dynamic characteristics of the Radwaste Building since they are at ground level. Therefore it is not necessary to perform a reanalysis of the collapse of the Radwaste Building due to the safe shutdown earthquake reported in AP1000 DCD Section 3.7.2.8.2.

Design Control Document (DCD) Revision:

None

PRA Revision:

None