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U.S. Nuclear Regulatory Commission
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Your ref: Docket No. 52-006
Our ref: DCP/NRC2249

September 5, 2008

Subject: AP1000 Response to Request for Additional Information (SRP3.7.2)

Westinghouse is submitting a response to the NRC request for additional information (RAI) on SRP Section 3.7.2. 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-SRP3.7.2-SEB1-03, as sent in an email from Mike Miernicki to Sam Adams dated July 31, 2008. This response completes all requests received to date for SRP Section 3.7.2. A response for RAI-SRP3.7.2-SEB1-01 and -02 was provided under letter DCP/NRC2143 dated May 28, 2008.

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 Request for Additional Information on SRP Section 3.7.2

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NRO

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ENCLOSURE 1

Response to Request for Additional Information on SRP Section 3.7.2

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

RAI Response Number: RAI-SRP3.7.2-SEB1-03
Revision: 0

Question:

In APP-GW-GLE-016, Revision 0, June 2008, section I. TECHNICAL DESCRIPTION, Westinghouse describes the instrument grid assembly that is added to the reactor vessel upper internals package. A number of design changes are identified for which the staff needs additional information, since they potentially affect the seismic analysis of the coupled containment internal structure/RCS:

- The shielding of the IHP has been reduced.
- The thimble rig is eliminated and the lower weight of the IHP allows for a smaller more compact lifting rig. Since the lifting rig is much smaller it remains on the IHP at all times during operation and refueling.
- The lower weight of the IHP allows the four CRDM cooling fans to be mounted directly on the IHP shroud structure. This eliminates the large plenums and ductwork as well as the CH-40 module that held the plenum, ductwork and four CRDM cooking fans.
- The seven inch thick seismic support plate is replaced with a thinner plate. The seismic support function of this plate is replaced by a seismic support system of the type used in the Westinghouse operating fleet.
- Since the IITAs remain underwater and are stored in the upper internals stand in the flooded reactor refueling cavity, a conventional head stand is used during refueling outages. This eliminates the large IHP head stand/water tank.

The staff requests Westinghouse to provide the following additional information related to these design changes:

(a) identify the original mass and the new mass of the RPV;
(b) identify the original cg location and the new cg location for the RPV;
(c) describe any seismic re-analyses that have been conducted as a result of these design changes;
(d) if no re-analysis has been conducted, provide the technical basis for concluding that these design changes have no effect on (1) the seismic response of structures and (2) the seismic response of the RCS, including the RPV.

Westinghouse Response:

(a) *Identify the original mass and the new mass of the RPV.*

The original calculated weight of the RPV (including the vessel, reactor internals, fuel, water, head, CRDMs, and IHP) is 1,900,000 lbs. The new calculated weight of the RPV is approximately 1,750,000 lbs. The percentage change in the mass is a decrease of approximately 8%.

(b) *Identify the original cg location and the new cg location for the RPV.*

The original calculated vertical cg location for the RPV (including the vessel, reactor internals, fuel, water, head, CRDMs, and IHP) is 75" below the RPV mating surface. The new calculated vertical cg location for the RPV is approximately 95" below the RPV mating surface, resulting in a lowering of the cg by 20.00". The location of the horizontal cg is approximately the same for both the original and new IHP configurations.

(c) *Describe any seismic re-analyses that have been conducted as a result of these design changes.*

Westinghouse has performed a preliminary analysis using the combined building and Reactor Coolant System (RCS) model that accounts for the changes to the IHP described in APP-GW-GLE-016. The results from this analysis show negligible change in the building seismic response due to the new IHP configuration. In addition, a seismic study utilizing a simplified, de-coupled RCS model has been performed. Results from this model have been reviewed at critical locations (i.e. primary equipment support locations and primary equipment nozzles). The small differences in the results demonstrate that the changes to the IHP are not expected to impact the RCS analysis conclusions.

(d) *If no re-analysis has been conducted, provide the technical basis for concluding that these design changes have no effect on (1) the seismic response of structures and (2) the seismic response of the RCS, including the RPV.*

Re-analyses have been performed for the building and RCS, as described in the response to item (c). The preliminary analyses show negligible change in the seismic response of the structures and seismic response of the RCS, including the RPV. Comparison of the original calculated RPV mass/cg to the new calculated RPV mass/cg, described in items (a) and (b), reinforces this conclusion as the change in mass is small in comparison to the overall mass of the systems involved.

AP1000 TECHNICAL REPORT REVIEW

Response to Request For Additional Information (RAI)

References:

1. APP-RXS-M3C-007, Rev. 2, Simplified Reactor Vessel Model for AP1000.
2. APP-MV10-S3C-020, Rev. C, Finite Element Representation of the Integrated Head Package (IHP) for the AP1000 RPV System Model.
3. APP-MV11-Z0-001, Rev. 1, Design Specification for AP10000 Control Rod Drive Mechanism (CRDM) Design.
4. APP-MV11-S3C-010, Rev. 0, AP1000 Control Rod Drive Mechanism Loading Inputs.

Design Control Document (DCD) Revision:
None

PRA Revision:
None

Technical Report (TR) Revision:
None