

**NRC Feedback on “KHNP Input Regarding RAI 252-8299, Question 03.07.02-7 and RAI 208-8245,
Question 03.08.03-5”
(Provided in the Revised Agenda for the 4/20/16 Bi-Weekly Meeting)**

Question 03.08.03-5:

1. The information provided for the connections of the slabs to the secondary shield wall (SSW) and to the containment is not clear. Provide a sketch showing the beam seat, bumper, and web angle connection at the SSW, and indicate on the sketch the direction of support/restrained (i.e., radial, vertical and/or tangential) that was modeled for the connection. Provide the same information for the connection of the slab at the containment.
2. Additionally, the information provided states that “The sliding connection at the containment wall is composed of a beam seat, a bumper, and a gap between the end of the steel beam and the containment wall to allow radial displacements due to seismic and thermal loads.” If the bumper at the slab to containment connection provides tangential support/restraint, then provide the basis for analyzing the containment internal structures and the containment separately, since in the vertical and tangential directions the two structures would be considered to be connected.
3. The information provided only identifies concrete slabs at elevations 114'-0”, 136'-6”, and 156'-0” between the secondary shield wall and containment wall. These are the slabs which are not explicitly modeled in the seismic SSI and the structural models, except for inclusion of their mass. The staff had requested that KHNP identify all slabs (horizontal floors regardless of span width and length, and thickness) which have not been explicitly included in the seismic SSI and the structural models (as applicable), and provide a justification for not including them.
4. For the three slabs identified above, a description was provided for the separate analysis and design of the slabs. When 1.5 times the peak acceleration is used, explain whether this means the peak of the floor response spectra at the secondary shield wall and at the containment in the restrained directions (as applicable); if not, explain why not. Also, for design explain why only flexure and out-of-plane shear is considered, and not the other concrete member forces too.
5. The information provided states that “All the masses of slabs considering the self-weight of the slabs, the 50 psf of misc. dead load, and the major equipment loads are lumped onto the secondary shield walls.” This statement appears to be inconsistent with the description in DCD Section 3.8A.1.4.3.1.3 which indicates that 50% of the weights are distributed to the containment and SSW. This apparent inconsistency should be explained. Also, the distribution of weights to be assigned to the SSW and containment would be expected to be a function of what directional restraints exist between the SSW and containment. Therefore, explain how the percentage of weight distribution to the SSW and containment are consistent with the direction of restraint between the two structures (as applicable) for the radial, vertical and tangential directions.

6. In its response to RAI 208-8245, Question 03.08.03-5, part b, the applicant stated that, "The gap between the end of the steel beam and the containment wall is 1 5/8" (1.625") which is larger than the maximum displacement of 1.58" (containment wall displacement by earthquake, thermal displacement, displacement by post-tensioning, and installation tolerance)." To check adequate clearance, the applicant is requested to explain why the gap isn't checked against the maximum differential displacement between the containment wall and the steel beam. Also, the RAI response did not explain how this differential displacement is calculated (e.g., assuming out of phase displacements for seismic and for tolerances (between the SSW and containment), and for thermal what was assumed for differential displacements).

Question 03.07.02-7:

1. For those slabs that are not explicitly modeled in the seismic SSI and the structural models, a description should be provided to explain how amplification of the slabs is considered in developing in-structure response spectra (ISRS). Amplified response spectra would be needed to qualify systems and components that are located on the slabs.
2. For concrete slabs that are explicitly modeled in the seismic SSI and the structural models, clarify whether or not, for seismic analyses, 25% of live loads is applied to those slabs. If 25% of live loads is excluded, provide evaluation of the associated effects on the seismic response of such slabs and reactor containment building.
3. Provide more detailed information on the evaluation performed (and to be performed, as applicable) for determining the effect of seismic live load on the seismic response of the reactor containment building. For the time history analyses, with fixed-base condition using two ANSYS models, the additional information should include specifically identifying which model was used (e.g., identifying which figure in the DCD), how the time history inputs were developed, if all three directions were input simultaneously, etc. Justify why only the SSW was evaluated and not also the containment, since it appears that there is some connection of the slabs to the containment.