

Bi-weekly Seismic Call Agenda

Date: 2016-03-09

Topics:

1. NRC has asked that KHNP describe why the SSSI and HRHF reanalysis will not be completed until September 30, 2016. (Due date of October 7, 2016)

For HRHF, KHNP's plans for additional analysis are as follows:

- RAI 183-8197, Question 03.07.02-1.a (Exceeding reduction limit of SRP 3.7.2.II.4): The parametric study is intended to use a LMSM for a generic containment structure (not APR1400 NI structures) with a circular basemat, such as that used in the EPRI Report TR-102631 2225 by Tseng, W.S. and K.I. Lilhanand (1997), "Soil-Structure Interaction Analysis Incorporating Spatial Incoherence of Ground Motions", Electric Power Research Institute, Palo Alto, CA, November 1997. The variation of the basemat size is controlled by a single parameter, which is the radius of the basemat. This parametric study will show that the larger the basemat size, the larger the calculated reductions in the incoherency analysis.
- RAI 183-8197, Question 03.07.02-1.b (Mode expansion for HRHF incoherency analysis): Previous HRHF incoherency analyses, which included 7 modes (in-house software used), took 8 months to complete. It is expected that approximately the same amount of time will be required for the mode expansion up to 15 modes and comparing the results of the new analysis with the old.

The following procedure will be used in mode expansion for HRHF incoherency analysis

- KHNP will perform ACS SASSI analysis for modes 13 to 15.
- The results (nodal ARS) of modes 8 to 15 will be combined with current documented results of the first 7 modes using SRSS to demonstrate that the contributions from the additional modes (modes 8 to 15) are insignificant and can be neglected.

2. The NRC is to clarify if there is more feedback regarding the response approach to RAI 129-8085, Question 03.08.01-4a (two

different ASME Code editions and addenda). KHNP is to indicate if a comparison of the NE code editions and addenda will be performed and results communicated with the NRC.

KHNP has performed the comparison for 2001 Edition with 2003 addenda vs 2007 Edition with 2008 addenda in ASME Section III, Division 1, Article NE-3000 Design, as shown in the Attachment. The comparison results show that the design rules in the 2001 Edition with 2003 addenda have no affect on APR1400 MC Components design, which applies the 2007 Edition (including 2008 Addendum) of ASME Section III, Division 1, NE-3000. Therefore, the MC component design for the APR1400 will apply the 2007 Edition (including 2008 Addendum) of ASME Section III, Division 1, Subsection NE in accordance with 10 CFR 50.55a.

3. Discuss draft response approach to RAI 226-8235, Question 03.07.02-6. (This question has a due date of October 7, 2016)

KHNP is to confirm whether or not the reference to the EDGB in this item is intended to also include the DFOT room. The NRC staff notes that the DFOT room is a seismic Category I structure adjacent to the NI that is within the scope of the design certification and therefore must be part of this analysis. The staff requests that KHNP confirms that the DFOT room is included in this analysis.

The DFOT room will be included.

4. Discuss feedback regarding RAI 267-8301, Questions 03.07.03-1 & 3.

A. Response of Feedback Q3.7.3-1

- The scope of DCD Subsection 3.7.3.9 is limited to the Above-Ground Tanks as the title of DCD Subsection 3.7.3.9 specifies.
- The SC-I tanks, which consist of walls and slabs of the building, such as the auxiliary feedwater storage and the FHA tanks are included in the seismic analysis model of the building as parts.
- The seismic analysis of SC-I tanks installed in building structure are performed by DCD Tier 2, Subsection 3.9.2.2.

B. Response of Feedback Q3.7.3-3

- The sentence (subsystem, must be ~) will be changed as suggested by NRC staff.
 - Constant vertical static factors: The reason of change the use of constant vertical factor could be used in detail design by COL applicant. The meaning of factor is same as static seismic acceleration coefficient in DCD 3.7.3.1.1.
 - Definition of concrete foundation: In this foundation, there are no additional steel frames. Steel frames equipment support does not follow seismic analysis method of rigid body motion.
5. Regarding RAI 199-8223 Question 03.08.01-11, the NRC concluded that additional information is needed to ensure that the jurisdictional boundary of the containment design approach is consistent with the ASME Code. KHNP will be prepared to discuss the jurisdictional boundary of the containment design with the NRC staff.

Regarding ASME Code Interpretation III-2-83-01, KHNP's position is as follows. First, in the APR1400 design, the anchoring of the containment shell reinforcement is limited within the ASME code boundary as shown in Figures 3.8A-16, and -17 of the DCD. (i.e, The anchoring is in the RCB foundation area directly beneath the containment shell, and this area is designed in accordance with ASME Section III, Division 2, Subsection CC.) Second, the portion beyond the RCB foundation is conservatively designed using the larger forces from the analysis results of the ASME and ACI codes. Third, at the interface between the ASME and ACI codes, a greater amount of reinforcement required by either code is used, and the reinforcement of the RCB foundation is developed into the AB foundation, as shown in Figures 3.8A-16 and -17 of the DCD. Therefore, the APR1400 design is consistent with the ASME code or more conservative.

6. Regarding RAI 199-8223 Question 03.08.01-13, KHNP would like to discuss with the NRC the feedback regarding the prestressing system used in the APR1400.

KHNP would like to confirm if it is acceptable to state a typical type of prestressing system will be used without adding to the DCD the specific manufacturer's product name. Moreover, KHNP will explain what type of the anchorage system is introduced in APR

1400 using VSL brochure. Regarding information on the past performance for the prestressing system, Shin-Kori Unit 3&4 in Korea is the only plant which uses VSL E6-42 anchorage System. There is no reported degradation or failure of prestressing system.

7. Discuss NRC feedback regarding RAI 253-8300, Question 03.07.01-5 and 8.

Outstanding Draft RAI Responses

RAI	Question	Draft Due Date	Draft Provided	Feedback Provided	Action With
182-8160	03.07.01-4	3/18/2016	N	N/A	KHNP
252-8299	03.07.02-7	7/31/2016	N	N/A	KHNP
252-8299	03.07.02-11	7/31/2016	N	N/A	KHNP
252-8299	03.07.02-12	3/18/2016	N	N/A	KHNP
252-8299	03.07.02-14	N/A	3/8/2016	N	NRC
252-8299	03.07.02-15	N/A	2/19/2016	N	NRC
129-8085	03.08.01-1	N/A	2/19/2016	N	NRC
129-8085	03.08.01-4a	3/18/2016	N	N/A	KHNP
226-8235	03.07.02-5	3/21/2016	N	N/A	KHNP
226-8235	03.07.02-6	10/7/2016	N	N/A	KHNP
183-8197	03.07.02-1.a	10/7/2016	N	N/A	KHNP
183-8197	03.07.02-4	3/18/2016	N	N/A	KHNP
199-8223	03.08.01-8	4/29/2016	N	N/A	KHNP
199-8223	03.08.01-9	N/A	2/23/2016	N	NRC
199-8223	03.08.01-10	3/18/2016	N	N/A	KHNP
200-8225	03.08.02-2	TBD	N	N/A	KHNP

227-8274	03.08.04-1	N/A	3/4/2016	N	NRC
227-8274	03.08.04-3	N/A	3/7/2016	N	NRC
227-8274	03.08.04-4	N/A	3/4/2016	N	NRC
227-8274	03.08.04-9	N/A	3/4/2016	N	NRC