

Staff Feedback on KHNP Responses to RAI Question 3.7.1-5

In letter MKD/NW-16-0097L, dated January 29, 2016

1 RAI Question 3.7.1-5

1.1 Initial Staff Feedback

The label “CSDRS” in the new figures in the DCD markup should be replaced with “CSDRS anchored at 0.1 g.”

The site response transfer functions, at the foundation level relative to the free field surface motions, are generally greater than 1 between 3 Hz and 20 Hz for the S6 and S7 soil cases, indicating that the CSDRS at the foundation level should generally be higher than the CSDRS (at the ground surface) in that frequency range. However, Figure 3.7A-12 shows the opposite (i.e., the $CSDRS_{ff}$ is lower than CSDRS). The staff requests the applicant provide further explanation on which dips in the transfer functions for S6 and S7 would cause the dips in the response spectra shown in Figure 3.7A-12.

1.2 Received draft revised response on 3/30/2016 through Erin Wisler’s email.

The revised RAI response provided additional information using S1, S2 and S5, and the information is helpful in staff’s review. The staff identified the following items for additional information:

- (1) Soil profiles were requested during the 3/23/2016 public call. The soil profile data were received. However, the soil profiles are in the forms of low strain properties and soil degradation curves (in SHAKE1991 format). Since only generic soil profiles are appropriate for DCD, the staff request the applicant to provide the DCD generic soil profiles (i.e., “strain-compatible” soil profiles in APR1400 DCD Rev. 0 that are used in SASSI SSI analyses).
- (2) The revised RAI response does not indicate whether the transfer functions were calculated using the generic soil profiles. The RAI response should be enhanced to confirm the use of generic soil profiles or provide justification otherwise.
- (3) Please also confirm that the second paragraph of NEI White Paper Section 3.1.3, “Embedded Structures Analyzed as Embedded Structures in the Certified Design,” was followed. If other procedure was used, please describe the procedure and provide justification.
- (4) The revised RAI response identifies large dips in the transfer functions in the last paragraph on page 3. Please identify which large dips (i.e., at what frequencies) in the transfer functions for S6 and S7 that possibly correlate to the large dips in the $CSDRS_{ff}$ between 3 Hz to 20 Hz?

1.3 Response contained in Letter MKD/NW-16-0731L, August 2, 2016

The revision to the RAI response provides necessary clarification on transfer functions that the staff requested during the audit, so that the dips shown in the response spectra at the foundation level for S6 and S7 can be explained.

For the DCD markup, the figure captions in Figures 3.7A-12 through 3.7A-14 using “site response motion at the foundation base elevation” do not indicate whether they are outcrop motions. Since the response spectra of the outcrop motions in the free field at foundation level are used to compare with FIRS in COLA, the applicant is requested to revise the captions and the DCD markup on page 3.7-3 to properly indicate that these response spectra are for the outcrop motions in the free field at the foundation levels.