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# North Anna 3 COLA

Slides for Discussion with NRC  
Questions and Comments

NRC Teleconference  
June 22, 2016



# NRC Questions 1 and 2

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- (1) In FSAR Revision 9 (Draft 05/12/16), some numbers presented in Section 3G.10.5.4.3 (Page 3-861) do not match with those presented in Table 3G.10-206 (Page 3-890). Specifically, Section 3G.10.5.4.3 (text) states that the maximum transverse shear force in the foundation mat is found to be 2.71 MN/m against a shear strength of 4.493 MN/m. However, Table 3G.10-206 indicates the maximum transverse shear force in the foundation mat of 2.557 MN/m against a shear strength of 5.975 MN/m. Please clarify these discrepancies. Also, Table 3G.10-206 should be referenced in the text but is not; therefore the last sentence in Section 3G.10.5.4.3 should be revised to end something like “, as shown in Table 3G.10-206.”
- (2) In FSAR Revision 9 (Draft 05/12/16), some numbers presented in Section 3G.10.5.4.4 (Page 3-861) do not match with those presented in Table 3G.10-206 (Page 3-892). Specifically, Section 3G.10.5.4.4 (text) states that the maximum transverse shear force in the shear keys is found to be 1.582 MN/m against a shear strength of 4.163 MN/m. However, Table 3G.10-206 indicates the maximum transverse shear force in the shear keys of 1.488 MN/m against a shear strength of 4.463 MN/m. Please clarify these discrepancies. Also, Table 3G.10-206 should be referenced in the text but is not; therefore the last sentence in Section 3G.10.5.4.4 should be revised to end with something like “, as shown in Table 3G.10-206.”

# NRC Questions 1 and 2 (continued)

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## Response:

- FSAR Section 3G.10 follows the format and content of DCD Section 3G.4. For example, Table 3G.10-206 is comparable to DCD Table 3G.4-21, consistent with the approach to follow the DCD format and content in the FSAR.
- FSAR Table 3G.10-206 values are representative of selected load combinations consistent with the DCD for the FWSC and it does not contain the results of all of the load combinations (Table 3G.10-206 is based on Table 7.2-9 of the technical report).
- The values for the maximum transverse shear are based on typical elements, which is also consistent with the DCD. These maximum values are presented in the FSAR (Section 3G.10.5.4) and are based on Section 7.2.3 of the technical report (not all of these maximum values are presented in Table 3G.10-206; specifically, the maximum transverse shear forces for the foundation mat and for the shear key are not in that table).
- The FSAR text correctly reports the maximum transverse shear values based on Technical Report WG3-U63-ERD-S-0003, Rev. 2, Section 7.2.3.
- Therefore, no FSAR revisions are required.

# NRC Question 3

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(3) FSAR Revision 9 (Draft 05/12/16), Table 3G.10-214(b) (Page 3-894) presents the FWSC sliding stability evaluation at the bottom of basemat where shear keys are involved in the analysis. The staff notes that the table presents shear key demands under fully “bonded” conditions between the concrete fill and surrounding soil. However, the shear key demands under “separation” between the concrete fill and surrounding soil control the shear key design and therefore should be included in Table 3G.10-214(b). The staff notes that Table 3A.17.14.5-202 provides shear key demands for both fully bonded and separated conditions.

## Response:

- The strategy for developing the information in the FSAR is to be consistent with the format of the DCD.
- Additionally, duplication of information was avoided.
- FSAR Appendix 3A presents the complete and comprehensive evaluation of Seismic Soil-Structure-Interaction analyses, including the evaluation and comparison of the effects of structural stiffness variations, SSSI and soil separation.
- However, consistent with the DCD, Appendix 3G contains the presentation of Foundation Stability and Dynamic Soil Bearing Pressure (without the duplication of results in Appendix 3A).
- Although Table 3G.10-214(b) does not contain the soil separation information (which is in Appendix 3A) Section 3G.10.5.5 has clear statements and explanations that these bounding results are used to develop the site-specific seismic load demands for use in site-specific structural evaluations presented in Appendix 3G.
- Therefore, no FSAR revisions are required.

*For purposes of discussion with NRC.*

# NRC Question 3 (continued)

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## Response (cont.):

- FSAR Section 3G.10.5.5 discusses the FWSC Foundation Stability and describes the following:
  - Site-specific sliding stability calculations described in Section 3A.17.14.5 show that the separation between the concrete fill and surrounding soil can amplify the responses.
  - Table 3A.17.14.5-202 summarizes and compares results (including results of fully bonded condition from Table 3G.10-214 (b))
  - Tables 3G.10-214(b) and 3A.17.14.5-202 show the maximum lateral resistance pressure transfer from the shear keys to the concrete fill supporting the FWSC basemat
  - The site-specific structural evaluation of the FWSC shear keys uses amplified lateral pressure loads that capture the effects of soil separation, applied in the finite element model along the FWSC shear keys

# NRC Question 06/22/2016

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- Draft FSAR Section 3G.7.5.4.2 states that “As discussed in Sections 3.8.3.5 and 3G.7.5.4.2.1, the standard design of the diaphragm floor is acceptable.” However, FSAR Section 3.8.3.5 has been deleted on Page 3-184 of the Draft FSAR.

## **Response:**

- Section 3G.7.5.4.2 has been revised and no longer refers to Section 3.8.3.5.