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In the Matter of:	DOMINION VIRGINIA POWER (North Anna Power Station, Unit 3) Commission Mandatory Hearing
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NRC-004

March 2, 2017

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE COMMISSION

In the Matter of)
)
DOMINION VIRGINIA POWER) Docket No. 052-017-COL
)
(North Anna Nuclear Power Station, Unit 3))

NRC STAFF RESPONSES TO COMMISSION PRE-HEARING QUESTIONS

Pursuant to the Commission’s “Order (Transmitting Pre-Hearing Questions)” of February 17, 2017, the Staff of the U.S. Nuclear Regulatory Commission hereby responds to the questions posed in that Order. These questions generally pertain to subjects discussed in the Staff’s final safety evaluation report (FSER)¹ or supplemental environmental impact statement (SEIS).²

The Commission’s Order directed some questions only to the Staff, some questions only to Dominion Virginia Power (the Applicant), and some to both the Staff and the Applicant. The attachment to this filing presents the Staff’s responses.

/Signed (electronically) by/
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Dated at Rockville, Maryland
This 2nd day of March 2017

¹ Final Safety Evaluation Report for the North Anna 3 Combined License Application (January 12, 2016).

² NUREG-1917, Supplemental Environmental Impact Statement for the Combined License (COL) for North Anna Power Station Unit 3; Final Report (March 2010).

ATTACHMENT A

NRC Staff Responses to Commission Pre-Hearing Questions

NRC STAFF RESPONSES TO COMMISSION PRE-HEARING QUESTIONS

- 1. In Request for Additional Information 5693, 2.5.2-3a, dated May 5, 2011 (ML11125A124), the Staff asked the Applicant to justify the one-dimensional (1D) site response analysis using only vertically propagating shear waves, given the complex topography of the subsurface layers. On August 25, 2011 (ML11241A058), the Applicant responded that the soil and rocks at the site are all derived from the same parent rock. The Applicant attributed the subsurface variability to the localized effects of weathering on minerals comprising the parent rock rather than to deposition of soil as distinct layers. For lateral variability, the Applicant states that the boundaries between rock types are gradational and so do not represent lateral impedance boundaries that may result in refraction, reflection, or trapping of the shear waves traveling in horizontal directions. Therefore, the site can be characterized as undulating, but not dipping, thus justifying the 1D analysis. The Applicant uses the same weathering process to explain the existence of vertical variation, but with distinct boundary impedances at different depths as shown in Final Safety Evaluation Report (FSER) Figure 2.5.2-5. Please discuss why the same weathering mechanism generates sharp boundaries vertically, but not laterally.**

Staff Response: The North Anna 3 site is located in a tectonically stable region and is underlain by a uniform type of crystalline bedrock (gneiss) that has undergone extensive weathering in the uppermost layers. Because the bedrock across the site area is uniform and gently undulating, the lateral variability in material properties, due to uneven degrees of weathering, is less distinct than the vertical interfaces.

Figure 2.5.2-5 of the FSER illustrates the average shear wave velocity profiles under the reactor and control buildings, which were developed from geophysical measurements in site boreholes B-901, B-907 and B-909. These two profiles show the interfaces within the bedrock as it transitions from moderately weathered (Zone 3) at an elevation of 270 ft to slightly weathered (Zone 3-4) at an elevation of 224 ft. For the reactor building profile (solid line), the applicant used the average velocity measurements from all three boreholes and for the control building profile (dashed line), the applicant used borehole B-909. The North Anna 3 final safety analysis report (FSAR) Figure 2.5-237, which shows the measured shear wave velocities from each of the three boreholes, demonstrates that the transition between the interfaces are gradual and variable rather than distinct across the power block area.

The staff finds the applicant's approach acceptable because the one-dimensional site response analysis used by the applicant is consistent with the current state of practice for site characteristics found at the North Anna 3 site. When performing the site response analysis, the applicant accounted for variability in layer thicknesses by developing multiple site profiles and using the envelope of the resulting response spectra to determine the final site specific ground motion response spectra (GMRS). This approach accounts for the lateral variability through the use of multiple profiles (i.e. sampling different portions of the cross-section) and is conservative.

2. **The FSER states that the Applicant concluded that the three-component strong ground motion accelerograms of the M5.8 Mineral earthquake recorded at the North Anna Unit 1 structure (the closest available strong motion recordings of the Mineral earthquake) “correlated well with ground motion prediction equations [(GMPEs)] for the [central and eastern United States] at high frequencies (peak ground acceleration (PGA), 5 Hz[]) but [that they] were lower than predicted at low frequency (1 Hz).”**

Since the GMPEs describe the free-field ground motion at a given location, how is the correlation with the recorded motion on the containment mat foundation (not a free-field location) justified?

Staff Response: In FSAR Section 2.5.2.1.3 “Significant Site Earthquakes” subsection “Strong-Motion Records” (Page 2-370), the applicant discusses a comparison of strong-motion recordings from the magnitude 5.8 Mineral, Virginia earthquake of 2011 with central and eastern United States (CEUS) ground motion prediction equations. This section provides an overview of findings from other researchers, not the applicant. The specific comparison cited in this question comes from the publication of C. Cramer et al. (2012) stating: “At short periods (PGA, 0.2s), ground motions agreed well with eastern ground-motion prediction equations, but were less than expected at longer periods (1.0s).”

There is no correlation used because the information provided in this FSAR Section 2.5.2.1.3 was not relied on by the applicant to develop the final site-specific ground motion response spectra (GMRS), foundation input response (FIRS), and performance based seismic response spectra (PBSRS). Instead, in accordance with Regulatory Guide 1.208, the applicant used the CEUS seismic source characterization (CEUS-SSC) model along with the Electric Power Research Institute (EPRI) 2013 Ground Motion Model to develop its GMRS. The staff found the GMRS developed by the applicant to be an adequate characterization of the seismic hazard for North Anna 3.

The staff understands that research on future ground motion prediction equations is ongoing for the CEUS under the NGA-East (Next Generation Attenuation for Eastern North America) project, and some researchers are assessing how to appropriately utilize the Unit 1 records from the Mineral, Virginia earthquake. At this time, the staff has not reviewed any new GMPEs that utilize the measurements from the Mineral, Virginia earthquake. If future applicants propose a GMPE that utilizes this data, the staff will evaluate its appropriateness at that time. In general, the applicant and the staff concur that the Unit 1 basemat structural recording of the Mineral earthquake should not be considered a free-field recording because of the potential structural effects on the recorded ground motion.

3. **The Applicant requested a variance from ESP, Appendix A, Figure 1, Note 2, which states, “Abandoned Unit 3 and 4 Reactor Building Mat Foundations are to be removed.” The requested variance, however, also indicates that the Applicant would “not remove the abandoned mat foundations ... unless a Unit 3 Seismic Category I or II structure would be located above an abandoned foundation.”**

For the Staff: The Staff states that the site layout in Final Safety Analysis Report (FSAR) Figure 2.4-201 is subject to control under the provisions of 10 C.F.R. § 50.59, and this control is sufficient to ensure that Dominion

will account for any effect the abandoned mat foundations might have. Please explain in more detail why the provisions of 10 C.F.R. § 50.59 are sufficient in this context.

Staff Response: As discussed in Section 2.04 of the staff FSER, the layout of the Economic Simplified Boiling Water Reactor (ESBWR) plant design for North Anna 3, will be founded on new concrete fill with underlying sound rock, and all safety-related or Seismic Category I or II structures will be away from the abandoned Units 3 and 4 foundations.

In the site safety analysis report for the North Anna early site permit (ESP), the applicant had developed its safety parameters based on two proposed units on the North Anna site, adjacent to current North Anna Units 1 and 2. This location would have required removal of the abandoned former North Anna Units 3 and 4 foundations, as indicated in the issued permit ESP-003, Appendix A, Figure 1, Note 2. The applicant incorporated ESP-003 by reference into the combined license application (COLA). However, the COLA modified the proposed location of Unit 3, and the revised location is shown in the Unit 3 site plan in Figure 2.1-201 of the North Anna 3 COLA FSAR, Revision 9. This location is approximately 1476 feet southwest of the center of the existing Unit 2 Containment Building and away from the abandoned Units 3 and 4 foundations. Therefore, these abandoned foundations will not need to be removed in order to construct the proposed new North Anna 3 Seismic Category I structures. For this reason, the applicant requested ESP VAR 2.0-7, which altered Appendix A, Figure 1, Note 2 to indicate that the foundations would not be removed.

Changes to the site layout are subject to control under the provisions of 10 CFR 50.59, and a license amendment may or may not be required under the criteria set forth in 10 CFR 50.59(c)(2) depending on the details of the proposed changes. Should the applicant propose changes to the site layout in the future, an analysis under 10 CFR 50.59(c)(2) will be performed at that time, and a license amendment will be required if the criteria in that regulation are met. For this reason, the staff determined that the process in 10 CFR 50.59 is sufficient in this context.

- 4. The FSER alludes to a license condition for training and procedures to mitigate a station blackout event, stating that “[b]ecause the detailed training and procedures [regarding mitigation of a station blackout event] will not be fully developed until required by license condition, they will be subject to inspection after implementation.” But the Staff does not identify a specific license condition or any other post-combined license activities. Please clarify which license condition(s) require(s) the post-licensing development and implementation of station blackout response training and procedures.**

Staff Response: The development and implementation for training and procedures for mitigation of a station blackout (SBO) are addressed in Chapter 13 of the staff FSER. Specifically, training is addressed in Section 13.4, “Operational Program Implementation” and procedures are addressed in Section 13.5, “Procedures.” In Part 10 of the North Anna 3 COLA, the applicant included a license condition for Operator Programs that includes training for mitigation of an SBO. This license condition is in the draft combined license (COL) (ML16242A135) as license condition 2.D.(11). Post-combined license activities for operating and maintenance procedures are addressed by the applicant in FSAR Section 13.5 and evaluated by the staff in FSER Section 13.5.2. More specifically, FSER Section 13.5.2.5

covers post-combined license activities and states that procedures, including procedures for mitigation of an SBO, will be developed prior to fuel load. Operating Procedures are subject to inspection in accordance with Inspection Manual Chapter 2504.

5. **Instead of providing the information to meet the requirements of 10 C.F.R. §§ 50.54(w), 140.11(a)(4), and 140.21 at the time of COL issuance, the Applicant proposed two license conditions to meet these requirements. The Staff accepted the conditions with minor variations and found that with the conditions the Applicant met all applicable requirements. Why is it acceptable to meet these requirements with a license condition without taking an exemption from the regulation?**

Both license conditions require action “before the scheduled date for initial fuel load.” Therefore, why are these requirements included as license conditions and not as Inspections, Tests, and/or Analyses and Acceptance Criteria?

Staff Response: The staff included the two license conditions to ensure that the NRC staff financial experts needed to verify that the licensee complies with the regulations are given sufficient time before fuel load to make this determination. It is important that the staff makes this determination before fuel load because the purpose of the insurance and indemnity requirements is to provide adequate compensation for damages and adequate funding to stabilize and decontaminate the reactor in the event of an accident during start up or later operations. The license conditions require specific reporting actions on the part of the licensee and are similar to license conditions included in the COLs for South Texas Project (STP) Units 3 and 4, Levy Units 1 and 2, and William States Lee III Units 1 and 2.

The reporting requirements were not included as ITAAC because ITAAC are not intended to cover financial matters such as these. As stated in Section 185b. of the Atomic Energy Act of 1954, as amended (AEA), ITAAC are included to verify that the plant has been constructed and will be operated in accordance with the license, the AEA, and NRC rules and regulations. However, the financial matters covered by the license conditions do not address construction or operation of the plant. Therefore, these financial matters are outside the statutory scope of ITAAC. The staff’s proposed approach is also consistent with the Commission’s staff requirements memorandum (SRM) on SECY-02-0067, in which the Commission stated, “A review of the regulatory and legislative history reveals that ITAACs were intended to be very narrow.” SRM-SECY-02-0067 at 1 (disapproving the staff’s proposal to include ITAAC for a wide range of operational programs).

Exemptions from 10 CFR 50.54(w), 140.11(a)(4), and 140.21 are not necessary as these requirements are not applicable until the NRC staff finds, in accordance with 10 CFR 52.103(g), that all acceptance criteria in the inspections, tests, analyses, and acceptance criteria (ITAAC) are met.¹ Specifically:

- The introductory language of 10 CFR 50.54 provides that paragraph (w) does not become a requirement for COL holders until the 10 CFR 52.103(g) finding is made.

¹ The Commission delegated the authority to make the 10 CFR 52.103(g) finding to the staff. See SRM-SECY-13-0033. When this finding is made, the licensee is allowed to operate the facility (including loading of fuel).

- The primary and secondary financial protection requirements of 10 CFR 140.11(a)(4) also do not apply until the 52.103(g) finding is made. The staff has consistently interpreted 10 CFR 140.11(a)(4) in this way, as documented, for example, in Section 1.5S.2.3 of the final safety evaluation report (FSER) for STP 3 and 4. Although 10 CFR 140.11(a)(4) does not specifically mention the Section 52.103(g) finding or any other Part 52 process, the NRC staff has interpreted 10 CFR 140.11(a)(4) in light of the fact that, although some revisions to Part 140 have been made to reflect Part 52, the NRC has not comprehensively updated Part 140 to specifically address how each component of Part 140 applies to COLs. Thus, interpreting how Part 140 applies to COLs requires (1) consideration of how Part 50 plants are treated in analogous circumstances, (2) consideration of other Part 140 provisions that directly address Part 52 plants, and (3) some effort to “translate” the Part 140 language to a Part 52 context.

Applying this interpretive lens to 10 CFR 140.11(a)(4), the staff concludes for several reasons that the requirements of this section do not apply until the Section 52.103(g) finding is made. First, the 10 CFR 140.11(a)(4) requirements for Part 50 plants are tied to the operating license, which allows the licensee to operate the reactor. There is no regulatory basis to treat Part 50 and Part 52 plants differently. Second, the 10 CFR 140.20 requirements for indemnity agreements specify the required effective date of the agreement for the Part 52 license as “[t]he date that the Commission makes the finding under § 52.103(g) of this chapter.” It makes no sense to interpret 10 CFR 140.11(a)(4) so that its provisions apply to COL holders before the required effective date of the indemnity agreement. Third, the form indemnity agreement applicable to North Anna Unit 3 is in 10 CFR 140.92. Article VIII of this form agreement, which requires the licensee to maintain primary and secondary financial protection, is applicable “to each licensee operating a facility designed for producing substantial amounts of electricity and having a rated capacity of 100,000 electrical kilowatts or more” (emphasis added). Thus, the requirement applies to an operating reactor, and under Part 52, operating reactor status is attained when the Section 52.103(g) finding is made. Fourth, 10 CFR 140.13 indicates that a COL holder is not obligated to have financial protection in the amounts required by 10 CFR 140.11(a)(4) until the Section 52.103(g) finding. In accordance with 10 CFR 140.13, a COL holder before the 10 CFR 52.103(g) finding who possesses a license under 10 CFR Part 70 to own, possess, and store fuel must have only \$1 million in financial protection, much lower than the amounts stated in 10 CFR 140.11(a)(4). If the 10 CFR 140.11(a)(4) requirements applied to COL holders before the 10 CFR 52.103(g) finding, this 10 CFR 140.13 requirement would be superfluous.

Finally, the text of 10 CFR 140.11(a)(4) also supports the staff’s understanding. Section 140.11(a)(4) applies to “each nuclear reactor which is licensed to operate and which is designed for the production of electrical energy and has a rated capacity of 100,000 electrical kilowatts or more.” The NRC staff interprets this language as not applying to COL holders until the Section 52.103(g) finding because, while the COL includes a license to operate, a nuclear reactor does not yet exist when the COL is issued, and a reactor cannot produce electricity until the 10 CFR 52.103(g) finding is made.

- The 10 CFR 140.21 requirements apply to “[e]ach licensee required to have and maintain financial protection for each nuclear reactor as determined in § 140.11(a)(4).” As explained above, the licensee is not “required to have and maintain financial

protection” in accordance with § 140.11(a)(4) until the 10 CFR 52.103(g) finding. Therefore, the 10 CFR 140.21 requirements also are not in effect until the 10 CFR 52.103(g) finding. This interpretation is also documented in Section 1.5S.2.3 of the FSER for STP 3 and 4.

- 6. The Staff’s Statement in Support of the Uncontested Hearing for Issuance of a Combined License for North Anna Power Station Unit 3 notes that, because the site-specific seismic conditions for North Anna Unit 3 are not bounded by the ESBWR Design Control Document seismic design parameters, the Applicant defines the SSE to include the Certified Seismic Design Response Spectra (CSDRS) and the site-specific foundation input response spectra (FIRS) for each seismically qualified structure. What are the practical implications for the SSE being defined in this manner as far as assessing future modifications to the plant with respect to seismic safety?**

Staff Response: Since both the CSDRS and the site-specific FIRS constitute the SSE design ground motion at North Anna 3 as established in the FSAR, any future modifications to the plant would be assessed against both the CSDRS and the FIRS. In addition, the applicant also stated in the FSAR, Section 3.7.1 that the SSE design ground motion (defined by both CSDRS and FIRS) is used in the operability assessments to demonstrate plant safety for the as-found conditions of safety-related structures, systems and components (SSCs).

- 7. Please provide the regulatory basis for the requirement that the schedule for implementation of the operational programs listed in FSAR Table 13.4-201, “Operational Programs Required by NRC Regulations,” includes site-specific Severe Accident Management Guidelines.**

Staff Response: Severe Accident Management Guidelines (SAMGs) are not listed in FSAR Table 13.4-201, “Operational Programs Required by NRC Regulations.” The applicant proposed a SAMG license condition in North Anna 3 COLA Part 10, “Tier 1/ITAAC/Proposed License Conditions.” License Condition 2.D.(11) in the draft North Anna 3 license, included both the FSAR Table 13.4-201 and the applicant’s SAMG license condition. While there is no explicit regulatory basis that requires a SAMG license condition, an equivalent license condition was proposed by Detroit Edison in their application for a combined license for the Fermi 3 facility, which also referenced the ESBWR design. The license condition was included in the approved Fermi 3 combined license.

- 8. Please explain the relationship between conditions 2.B.(1)(a) and (b) in the draft COL. Condition (a) appears to grant Dominion authority to operate the facility, while condition (b) appears to remove that same authority. When the owner and operator of the facility are the same company—as is the case here—is it necessary to include condition (b) in the COL?**

If the Staff intends to retain the condition, please discuss the reason for the difference between the North Anna and Fermi licenses.

Staff Response: The use of both Conditions 2.B.(1)(a) and (b) for the North Anna 3 license is not necessary. The two-part format is used when there are co-applicants for a COL. For the

proposed North Anna 3, Dominion is currently the sole applicant, and the staff therefore proposes deleting Condition 2.B.(1)(b) from the draft license.

9. **License Condition 2.D.(2), “Startup Administration Manual, Preoperational and Startup Test Procedures,” was not included in the Fermi COL. Please discuss why it was added for this subsequent COL.**

Staff Response: The inclusion of the license condition in the North Anna 3 draft license is correct. In response to a staff RAI, Dominion proposed the use of a license condition and incorporated it into Part 10 of its COLA. The staff evaluation of the need for the license condition is found in Section 14.2 of the FSER for North Anna 3. The license condition is incorporated into the draft license as License Condition 2.D.(2).

10. **License Condition 2.D.(12)(f)2., “Mitigation Strategies for Beyond-Design-Basis External Events,” requires that the overall integrated plan for mitigation strategies “include provisions to ensure that all accident mitigation procedures and guidelines ... are coherent and comprehensive.” The analogous license condition in the ESBWR reference COL (Fermi Unit 3), Condition 2.D.12.g.2, requires that the overall integrated plan for mitigation strategies “include provisions to address all accident mitigation procedures and guidelines.” Language similar to this appears in other COLs that have been issued since Fermi Unit 3. What prompted the change in the language for this license condition in the North Anna Unit 3 draft COL?**

Staff Response: The language of the license condition evaluated by the staff is found in FSER Section 20.1.5, and is equivalent to the Fermi 3 License Condition 2.D.12.g.2. To align the license with the condition described in the FSER, the staff proposes revising North Anna 3 COL Condition 2.D.(12)(f)2. to match the equivalent Fermi 3 license condition.

11. **10 C.F.R. § 52.79(b)(3) states that any terms and conditions of the early site permit (ESP) that could not be met by the time of COL issuance “must be set forth as terms or conditions of the combined license.” Section 3.E of the North Anna ESP includes six site-specific conditions. Please describe where these conditions were met in the FSAR and evaluated in the FSER or where they appear in the draft COL.**

Staff Response: In the North Anna 3 ESP-003, Amendment No. 3, Section 3.E. states, “The following conditions apply,”

- (1) [Deleted] -

Response: Not applicable, because this condition was deleted in ESP Amendment No. 3.

- (2) An applicant for a CP or COL referencing this ESP for a second new unit shall use a dry cooling tower system to remove waste heat from the working fluid passed through the turbine/generator set during normal operation.

Response: In FSAR Table 1.10-202, the applicant stated that ESP Permit Condition 3.E(2) was not applicable. This condition is for a second new unit while the current COLA is a request for a single ESBWR plant. In FSER section 2.4.1, the staff confirmed that ESP Permit Condition 3.E(2) was not applicable because the applicant did not request a second new unit in their COLA. In addition, the staff evaluated the circulatory water systems and normal heat sink for a single ESBWR plant in FSER Section 10.4.5. If a future application is submitted for a second new unit referencing the ESP, then this condition would apply accordingly. The staff has therefore found that the requirements of ESP Permit Condition 3.E(2) do not apply.

- (3) An applicant for a CP or COL referencing this ESP shall ensure that any new unit's radioactive waste management systems, structures, and components, as defined in Regulatory Guide 1.143, "Design Guidance for Radioactive Waste Management Systems, Structures, and Components Installed in Light-Water-Cooled Nuclear Power Plants," for a future reactor include features to preclude accidental releases of radionuclides into potential liquid pathways.

Response: The applicant describes, in FSAR Section 2.4.13, the mitigating design features of the radioactive waste management systems, structures, and components for Unit 3, as defined in RG 1.143, that are intended to preclude accidental releases of radionuclides into potential liquid pathways. Mitigating design features considered acceptable by BTP 11-6, "Postulated Radioactive Releases Due to Liquid-Containing Tank Failures," and DC/COL-ISG-013, "Assessing the Radiological Consequences of Accidental Releases of Radioactive Materials from Liquid Waste Tanks," are incorporated into the design of Unit 3 to preclude an accidental release of liquid effluents.

Staff confirmed that the applicant met ESP Permit Condition 3.E(3) by describing the required design features to preclude the accidental release of radionuclides to potential liquid pathways as discussed in SER Section 2.4.13.

- (4) An applicant for a CP or COL referencing this ESP shall excavate weathered or fractured rock at the foundation level and replace it with lean concrete before the commencement of foundation construction for safety-related structures.

Response: The staff evaluated the North Anna 3 geology, seismology, and geotechnical engineering in Section 2.5 of the FSER. The applicant stated in FSAR Section 2.5.1.2.6 that weathered or fractured rock encountered at the site will be excavated and replaced with lean concrete that will have adequate engineering properties to support structures and that is non-liquefiable under all safety-related structures. In addition, the applicant proposed ITAACs (Tables 2.4.1-1 in Section 2.4 of North Anna COLA Part 10) specifically for the concrete fill to ensure its in-place properties. In FSER Sections 2.5.4.4.5, the staff concluded that the excavation and backfill plans described by the applicant are acceptable and the requirements of ESP Permit Condition 3.E(4) have been met.

- (5) The permit holder and an applicant for a CP or COL referencing this ESP shall not use an engineered fill with high compressibility and low maximum density, such as saprolite.

Response: The staff evaluated the North Anna 3 geology, seismology, and geotechnical engineering in Section 2.5 of the FSER. The applicant stated in FSAR Section 2.5.1.2.3 that engineering fill such as saprolite will not be used to support or backfill seismic Category I or II structures. The applicant will place lean concrete backfill underneath all seismic Category I structures, and use well-graded, highly compacted, angular to sub-angular gravel-sized particles of crushed rock as backfill material surrounding foundations. In FSER Sections 2.5.4.4.5, the staff concluded that both lean concrete and crushed rock meets design requirements for backfill and the requirements of ESP Permit Condition 3.E(5).

- (6) If the ESP holder performs an excavation for a safety-related structure, the ESP holder shall perform geologic mapping of such excavation, evaluate any unforeseen geologic features that are encountered, and notify the NRC no later than 30 days before any such excavation is open for NRC examination and evaluation. An applicant for a CP or COL referencing this ESP shall perform geologic mapping of any excavation for a safety-related structure, evaluate any unforeseen geologic features that are encountered, and notify the NRC no later than 30 days before any such excavation is open for NRC examination and evaluation.

Response: The staff evaluated the North Anna 3 geology, seismology, and geotechnical engineering in Section 2.5.1 of the FSER. Staff identified License Condition 2.5.1-1, wherein the licensee shall (1) perform detailed geologic mapping of future excavations for North Anna 3 nuclear island structures; (2) examine and evaluate geologic features discovered in excavations for safety-related structures; and (3) notify the Director of the Office of New Reactors, or the Director's designee, once excavations for North Anna 3 safety-related structures are open for examination by staff. Because this license condition cannot be met prior to excavation, this license condition is found in the draft COL in section 2.D.(12)(e) on page 15.

- (7) An applicant for a CP or COL referencing this ESP shall improve Zone II saprolitic soils to reduce any liquefaction potential if safety-related structures are to be founded on them.

Response: The staff evaluated the North Anna 3 stability of subsurface materials and foundations in Section 2.5.4 of the FSER. In FSAR Section 2.5.4.8, the applicant states that all safety-related structures would be founded on rock or concrete fill placed on rock. The applicant stated that it would remove Zone II saprolite and replace it with concrete backfill for all safety-related and/or seismic Category I structure foundations at the North Anna 3 site. In FSER Section 2.5.4.4.8, the staff concluded that replacing saprolitic soil with concrete fill will effectively eliminate the liquefaction potential and the requirements of ESP Permit Condition 3.E(7) have been met.

12. What is the status of pending environmental permits, certifications, and authorizations?

Staff Response: Dominion's most recent submission of its environmental report (ER) (Revision 8, dated June 2016) contains an updated list of the authorizations, certifications and permits that Dominion must obtain before building and operating North Anna Unit 3 (Table 1.2-1). During a July 5, 2016, teleconference with Dominion, the staff confirmed that the table in Revision 8 of the ER accurately depicts the current status of required authorizations and

permits. Since the COL Supplemental Environmental Impact Statement (SEIS) was issued, Dominion has received a Clean Water Act Section 401 Water Quality Certification as part of the Virginia Water Protection Permit (ML12284A522) and the Commonwealth of Virginia concurred on Dominion's consistency determination for the Coastal Zone Management Act Certification (ML111370769).

Dominion anticipates performing the activities for which the listed authorizations are required over an extended period of time. Some of the activities require permits that will not be granted until shortly before the scheduled start of an activity or will be partially granted at various stages of an activity. These permits are not required for COL issuance.

The response to Question 22 includes information related to the current status of the Department of the Army permit under Section 404 of the Clean Water Act and Section 10 of Rivers and Harbors Act.

- 13. For some resource areas, the Staff relied on commitments made by Dominion when making its impact determinations. For example, Final SEIS § 4.2 states:**

[b]ecause the COL application is for a single unit instead of the two units addressed in the ESP EIS (NRC 2006), it is anticipated that fewer construction workers would be required at any one time. Thus, the potential air-quality impacts would be less than originally estimated for the ESP application. Given the continued commitment by Dominion to develop a traffic management plan and current air-quality conditions within the region, the initial conclusion reached in the ESP EIS (NRC 2006), SMALL, remain[s] the same and additional mitigation beyond the currently planned actions is not warranted.

**How does the Staff intend to ensure that those commitments are met?
How did the Staff's new and significant information analysis (performed following issuance of the Final SEIS) take into account those commitments?**

Staff Response: Consistent with NEPA principles and staff guidance, in determining whether to rely on mitigation measures in its evaluation of environmental impacts, the staff considers whether the implementation of such measures is reasonably foreseeable. Interim Staff Guidance-26 "Environmental Issues Associated with New Reactors" provides examples of reasonably foreseeable mitigation measures, including situations where (1) the mitigation is required by the NRC as a license condition; (2) the mitigation is required by another regulatory agency; or (3) the applicant has committed to mitigation measures in document(s) submitted to the NRC under oath or affirmation and the staff reviews and documents its basis for determining the mitigation is reasonably foreseeable (e.g., the mitigation is an integral part of the project or can be considered standard industry construction practices).

As required by the ESP, Dominion submitted an Environmental Protection Plan (EPP) in its COL ER that included those mitigating actions that it identified to avoid any unnecessary

adverse environmental impacts from construction activities and from facility operation. As part of its review of the COL ER, the staff confirmed that those assumptions and representations upon which it relied for impact determinations for the ESP review were included in Dominion's EPP (Appendix 1A of the COL ER). The staff also confirmed that any mitigating activities upon which it based its review of new information presented in the COL ER were likewise included in Dominion's EPP.

In addition, the staff notes that many of the mitigation measures presented by Dominion are considered standard practice in the construction industry (Best Management Practices) or will be required by other Federal, state or local permits or ordinances.

The staff has included a reference to Dominion's COL EPP in the staff's EPP in Appendix B of the draft COL (ML16242A135). This affirms the staff's basis for determining that these mitigating actions (such as the example cited in the question) will be implemented. Therefore, the staff concluded that the implementation of these mitigation measures is reasonably foreseeable.

In its evaluation of new information following issuance of the COL SEIS, the staff accounted for the proposed mitigation measures in the same manner as in the COL SEIS.

- 14. In § 6.3 of the Final SEIS, the Staff stated that it “has no reason to believe that the impacts discussed in [Generic Environmental Impact Statement for Decommissioning of Nuclear Facilities: Supplement 1, Regarding the Decommissioning of Nuclear Power Reactors (Decommissioning GEIS)] are not bounding for reactors deployed after 2002.” Section 6.3 also notes that the impacts of decommissioning were reserved for the COL stage of the proceeding, meaning these impacts were not resolved during the ESP proceeding.**

In the Decommissioning GEIS (see §§ 4.3.7.4, 4.3.13.4, 6.1), the NRC did not make generic conclusions for some resource areas (e.g., threatened and endangered species, environmental justice), instead stating a site-specific analysis should be completed. How did the Staff capture those site-specific impacts of decommissioning in the Final SEIS?

Staff Response: In Section 6.3 of the COL SEIS for the North Anna 3 COL, the staff relied on the Decommissioning GEIS as the basis for its conclusions regarding the generic impacts of decommissioning. As discussed in the Decommissioning GEIS, the site-specific issues of endangered species consultation and environmental justice cannot be resolved generically and will have to be addressed after the permanent cessation of operations. Four other issues were determined to be, depending on the circumstances, either generic or site-specific: land use, aquatic ecology, terrestrial ecology, and cultural and historic resources. At the time the COL is issued, the applicant/licensee is not required to have a detailed plan for decommissioning the plant, and information on affected resources decades from now cannot be ascertained at this time. The decommissioning plan will be developed by the licensee at, or shortly after, the end of the operating life for the plant. The site-specific impacts of decommissioning can only be addressed at that time, as discussed in the Decommissioning GEIS.

A licensee must submit a post-shutdown decommissioning activities report (PSDAR) prior to or within two years following the permanent cessation of operations. Regulatory Guide 1.185, *Standard Format and Content for Post-Shutdown Decommissioning Activities Report*, states that the licensee should compare decommissioning environmental impacts to the impacts evaluated in previous NRC environmental reviews. Further, "For those activities determined to have impacts greater than those evaluated in the decommissioning GEIS, FES, or site-specific analysis, the licensee must complete a supplement to these documents before it initiates activities."² Therefore, to the extent that the licensee identifies in the PSDAR impacts for the site-specific issues that are not bounded by previous NRC environmental reviews, the licensee will inform the NRC staff.

15. Please describe the Staff's National Historic Preservation Act (NHPA) Section 106 consultation efforts since publication of the Final SEIS.

Staff Response: The COL SEIS, which evaluated the potential environmental impacts of the construction and operation of an ESBWR, the reactor design referenced in Dominion's COL application, was issued in March 2010. In May 2010, Dominion elected to change the reactor design referenced in its COL application from the ESBWR to the U.S. Advanced Pressurized Water Reactor (US-APWR), and the staff determined that it would prepare a supplement to the COL SEIS to evaluate impacts from this project change. As a result, in February 2011, the NRC staff requested to reinstate consultation with the SHPO (Virginia Department of Historic Resources (VDHR)) (ML110030219). From 2011-2013 the staff received communications from Dominion regarding actions it was taking pursuant to commitments stated in the COL SEIS. At the same time, NRC was consulting with VDHR regarding the supplement to the COL SEIS for the US-APWR design. By letter dated April 25, 2013 (ML13120A016), Dominion notified the NRC of its decision to return to the ESBWR, as referenced in the COL SEIS. The NRC later determined that it need not prepare a supplemental environmental impact statement (80 FR 4949, Jan. 29, 2015).

As noted in the staff's letter to conclude consultation with VDHR dated September 3, 2014 (ML14167A531), the staff requested VDHR to confirm the staff's prior finding of no adverse effect. By letter dated October 3, 2014 (ML16172A193), VDHR concurred with NRC's prior finding of no adverse effect provided that Dominion's commitments as stated in VDHR's earlier letter to Dominion dated October 5, 2011 (ML11298A131) are honored. This 2014 letter to NRC concluded the NRC's NHPA Section 106 consultation with the VDHR. Dominion's commitments described in VDHR's October 5, 2011, letter are included in the staff's Environmental Protection Plan in Appendix B of the draft COL (ML16242A135).

The staff continued to review survey reports and the interactions between Dominion and VDHR that occurred since issuance of the COL SEIS, and to evaluate new information as part of its process to evaluate new and potentially significant information identified after the publication of the COL SEIS. For further discussion, see the staff response to Question 25.

16. How did the U.S. Army Corps of Engineers' recent designation (available at ML16333A396) of the NRC as the lead federal agency to fulfill the collective federal responsibilities under Section 106 of the NHPA and its

² An FES is a Final Environmental Statement, the terminology that was used in the past by the staff to refer to the documents now called final environmental impact statements.

authorization for NRC to conduct Section 106 coordination on its behalf affect the Staff's efforts in this area?

Staff Response: The U.S. Army Corps of Engineers' (USACE) recent 2016 letter had no effect on the staff's efforts regarding Section 106. The staff received an earlier letter from USACE in 2009 which identified the NRC as the lead federal agency for NHPA Section 106 consultation (ML090710426). Because NRC coordinated compliance with Section 106 of the NHPA with its NEPA review, details related to NHPA Section 106 compliance requirements were included in Section 4.6 of the COL SEIS. Additional details regarding the staff's NHPA Section 106 consultation is provided in the staff response to Question 15.

- 17. In the recent environmental reviews for combined license applications (for example, Levy Nuclear Plant, Units 1 and 2; William States Lee III Nuclear Station, Units 1 and 2; and South Texas Project, Units 3 and 4), the U.S. Army Corps of Engineers participated as a cooperating agency in the preparation of the EIS. What role did that agency have in the North Anna combined license application review?**

Staff Response: The USACE was not a cooperating agency in the preparation of the COL SEIS. Since the issuance of the Memorandum of Understanding (MOU) with the USACE dated September 12, 2008 (ML082540354), most new reactor environmental impact statements (EISs) have included the USACE as a cooperating agency. However, the MOU does acknowledge that there may be some circumstances where both agencies will be better served by a different form of coordination and the MOU does not preclude such arrangements. Similar to the Vogtle COL SEIS, the North Anna COL SEIS supplemented an ESP EIS which was completed prior to the MOU and before cooperation with the USACE became common practice. Both the North Anna ESP EIS and the COL SEIS were prepared before Dominion submitted its application for a Department of the Army permit.

In addition to interactions between Dominion and the USACE to provide the NRC with information regarding the wetland delineation and jurisdictional determination for the project, the Staff requested comments from the USACE on the draft COL SEIS (ML090140270). The USACE responded (ML090890275) and at that time designated the NRC as lead agency for Section 106 Consultations under the NHPA. After the issuance of the COL SEIS, Dominion submitted an application for a Department of the Army Section 404 permit, and the USACE incorporated by reference the NRC's ESP EIS and COL SEIS into its Environmental Assessment for its permit review. The permit was issued in September 2011. See the staff response to Question 22 for the current status of the USACE permit.

- 18. A general license for an independent spent fuel storage installation (ISFSI) is issued under 10 C.F.R. § 72.210 to all COL holders.**
- **Did the Staff explicitly consult with the Virginia State Historic Preservation Officer (SHPO) and Tribes on the issuance of a general license to Dominion for an ISFSI at the North Anna site?**
 - **If the Staff did not inform the SHPO and Tribes about the general license for an ISFSI during consultation, did the Staff inform them after consultation? If so, what was their response?**

- **If the Staff did not inform the SHPO and Tribes of the general license for an ISFSI during consultation, explain why the Staff's NHPA consultation was adequate.**

What requirements or procedures would ensure that historic and cultural resources are adequately protected if the Applicant constructs an ISFSI?

Staff Response: The staff did not explicitly discuss with the SHPO (Virginia Department of Historic Resources (VDHR)) and Tribes the issuance of a general license to Dominion for an ISFSI at the North Anna Power Station (NAPS) site during consultations prior to issuance to the COL SEIS, but conducted post-consultation outreach to the VDHR regarding the availability of an ISFSI general license to Dominion at NAPS site. The staff contacted the VDHR on October 26, 2016, and stated that, in accordance with 10 CFR 72.210, issuing the COL would mean the NRC also issued a general license for the licensee to build and operate an ISFSI. The VDHR expressed no concerns.

The purpose of the post-consultation phone call to the VDHR was an additional outreach step, but was not necessary to satisfy the NRC's NHPA consultation obligations. The phone call served solely to remind the VDHR that when the NRC issues a COL, NRC regulations also authorize other related activities, such as the option to build and operate an ISFSI to store spent nuclear fuel under 10 CFR Part 72. The staff determined that further outreach was not necessary.

The staff's NHPA consultation was adequate because it followed its guidance and consulted on the entirety of the NAPS site. Per NRC regulations at 10 CFR 72.210, ISFSIs are required to be located at the reactor site. In addition, in a letter dated October 3, 2014, the VDHR concluded consultation with the NRC based on Dominion carrying out certain commitments (see ML16172A193 and ML11298A131). The following commitments are included as a license condition in the staff's proposed COL EPP, and require Dominion to:

- In accordance with Section 106 of the National Historic Preservation Act, implement the Ground Disturbance Plan to minimize impacts to archaeological site 44KW0081 associated with the construction of a barge roll-off facility on the Mattaponi River for the transport of large components. In addition, avoid archaeological sites 44LS0221, 44LS0222, 44LS0226, 44LS0227, 44LS0233, and 44SP0618 during construction and operation of Unit 3.

In addition, the following commitments were incorporated into the applicant's environmental report in Tables 1 and 2 in Appendix 1A, which is referenced in the staff's proposed EPP, and reflect Dominion's commitment to:

- Conduct sub-surface testing prior to initiating ground disturbing activities to identify buried historic or archaeological resources (ESP-ER Section 4.1.3).
- Take appropriate actions (e.g., stop work) following discovery of potential historic or archaeological resources (ESP-ER Section 4.1.3).
- Use existing Virginia Power procedures that require contacting the appropriate regulatory agencies following a discovery of potential historic or archaeological resources (ESP-ER Section 4.1.3).

- Coordinate with the VDHR regarding the potential presence of historic and cultural resources within planned disturbed areas and notify VDHR in the event of any unanticipated discovery (ESP-ER Section 4.1.3).
- Take appropriate actions (e.g., stop work) following discovery of potential historic or archaeological resources (Sections 4.1.2 and 4.1.3).
- While the goal is zero impacts to historic properties and cultural resources located adjacent to the proposed large component transport route, take appropriate actions for potential impacts include rehabilitation of land, removal of debris, and restoration of damaged property (Section 4.1.3).
- To help avoid impacts to the archaeological resource along the transmission corridor, mark and/or flag the identified archaeological site prior to and during construction of the new transmission line (Section 4.1.3).
- Stop work and follow appropriate procedures to notify the Virginia Department of Historic Resources upon the discovery of potential historic or cultural resources.
- Although the operation of the new units are not expected to require changes in land use (ESP-ER Section 5.1), conduct any ground-disturbing activities necessary for operations in coordination with the VDHR and conduct professional archaeological practices consistent with the process established for construction activities (ESP-ER Section 4.1.3).

Dominion also has corporate procedures and a cultural resources management plan that call for Dominion employees to stop work and coordinate with the VDHR if it inadvertently discovers historic or cultural resources on the site. These requirements and procedures ensure that historic and cultural resources are adequately protected if Dominion constructs an ISFSI.

19. Dominion proposed several exemptions to otherwise-applicable regulatory requirements in its application. Please discuss how the Staff addressed the exemptions in its environmental review.

Staff Response: The applicant's proposed action to construct and operate one nuclear unit includes requests for five exemptions from information in the ESBWR design certification under 10 CFR Part 52, Appendix E, Section VIII (see Table 1 of SECY-17-0009). The requested exemptions came after the COL SEIS was issued. The exemptions were evaluated as part of the environmental new and significant information review, with the following results for each exemption:

Exemption 1: The Special Nuclear Material Accountability exemption requests, as permitted by 10 CFR 70.17 and 10 CFR 74.7, exemption from the provisions of 10 CFR 70.22(b), 70.32(c), 74.31, 74.41, and 74.51 relating to special nuclear material accountability. Specifically, this exemption request would extend the current exceptions embodied in these regulations applicable to 10 CFR Part 50 licensees to the requested Unit 3 10 CFR Part 52 COL. This exemption is an administrative issue involving the requirements that Dominion must satisfy for a program for material control and accounting of special nuclear material under Sections

74.31, 74.33, 74.41, and 74.51 to be the same as for nuclear power plants licensed under Part 50. Thus, this exemption does not affect the assumptions and information that were the basis for the environmental findings in the COL SEIS.

Exemption 2: The Electric Power Distribution System Functional Arrangement exemption requests changes for certain information depicted on DCD, Tier 1, Figure 2.13.1-1, *Electric Power Distribution System Functional Arrangement*, Sheet 1. This exemption only involves the site-specific design of the switchyard for Unit 3. Therefore, the exemption does not affect the assumptions and information that were the basis for the environmental findings in the COL SEIS.

Exemption 3: The Ground [Motion] Response Spectra for Seismic Structural Loads and Floor Response Spectra exemption involves the Unit 3 safe-shutdown earthquake to include the certified seismic design response spectra and the site-specific foundation input response spectra for each seismically qualified structure. This exemption was reviewed under the seismic safety review of the Final Safety Evaluation Report Sections 2.5.2 and 3.7.4. The staff confirmed during the environmental new and significant information review that this exemption did not affect the assumptions and information that were the basis for the environmental finding in the COL SEIS, as discussed in the response to Question 30.

Exemption 4: The Liquid Waste Management System Discharge exemption is supported by the analysis in the ESP EIS and the COL SEIS, Sections 5.9 where the staff determined the environmental impacts at the proposed location for liquid radioactive waste discharge to be SMALL.

Exemption 5: This exemption concerns Footnote 7 to DCD Tier 1, Table 5.1-1 which was modified to ensure the ESBWR design will withstand site-specific hurricane missiles calculated in accordance with RG 1.221, issued October 2011. The exemption is a safety matter and did not affect the assumptions and information that was the basis for the environmental findings in the COL SEIS.

Based on the above exemption assessments, the staff found the impacts to be bounded to by the environmental findings within the ESP EIS and COL SEIS.

20. Did the Applicant propose any novel environmental approaches in the environmental portion of its application? How did the Staff address these approaches?

Staff Response: Dominion did not propose any novel technical approaches in its COL ER. However, Dominion is the only applicant to date whose application references an ESP that used the plant parameter envelope (PPE) approach and that deferred issues to the COL review. Chapter 1 of the COL SEIS includes a description of the process that applicants and staff use for preparing and reviewing the environmental portion of a COL application that references an ESP. Dominion's ER and the staff's review followed the guidance in the Environmental Standard Review Plan (NUREG-1555) and other applicable guidance documents; therefore, the staff found the process acceptable.

21. Please highlight major themes from the comments on the Draft SEIS, and generally describe the Staff's responses to those comments.

Staff Response: The staff issued the draft COL SEIS in December 2008 for public comment. A public meeting was held in Mineral, Virginia on February 3, 2009, which was transcribed, to collect comments from interested stakeholders in the area of the proposed project. Of the 120 attendees at the public meeting, 39 provided oral comments. During the 75 day comment period and a 30 day extension, the staff received 181 letters and e-mail messages with comments. The staff addressed 1580 individual comments extracted from the open-house and meeting transcripts, letters, and emails. Many of these comments were received as part of a form letter from several commenters.

Some comments addressed topics and issues that are not part of the environmental review for this proposed action. These comments included questions about the NRC review and regulatory processes, general comments of support or opposition to nuclear power, or topics that are part of the NRC safety review such as seismic characteristics or security and terrorism. With respect to these comments, the staff generally either acknowledged the commenter's general support for or opposition to the application or explained why the matter raised was not within the scope of the staff's environmental review.

With respect to those comments on topics covered in either the staff's ESP or COL environmental review, the themes of the comments related primarily to the areas of hydrology (surface water use and water quality), ecology (terrestrial and aquatic), energy alternatives, socioeconomics, need for power, the benefit-cost balance, air quality, concerns regarding radiation exposure from normal and accidental releases, and concerns related to the onsite storage of nuclear waste. For those comments where the staff determined that the information provided was either not new or did not have the potential to change the staff's conclusion, the staff response generally directed the commenter to the section of the ESP EIS where the issue had previously been evaluated and resolved. For those comments where the staff determined that the information provided was within the scope of the COL review, the staff response generally directed the commenter to the section of the COL SEIS where the issue was evaluated, and indicated whether or not that section had been revised as a result of the comment. Most responses included a brief explanation of how a section of the COL SEIS was revised, or why a section was not revised.

22. Several sections of the draft Record of Decision (ROD) list mitigation measures that were required of the Applicant by the U.S. Army Corps of Engineers' Section 404 Permit. These mitigation measures were also discussed in the Final SEIS when making impact determinations. However, the ROD also states that "[t]he [U.S. Army Corps of Engineers temporarily suspended its permit on November 16, 2016, pending completion of consultation under the Endangered Species Act." What effect does the suspended permit have on the conclusions in the Final SEIS that relied on implementation of these mitigation measures?

The draft ROD states that the suspension is temporary. What is the Staff's best estimate of when the permit will be reinstated? Does the Staff have any indication of whether the mitigation measures listed in the permit will be included in any new permit?

Staff Response: The USACE completed its review of Dominion’s application for a Department of the Army permit issued under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act and issued the permit to Dominion in 2011. On November 16, 2016, the USACE decided to temporarily suspend its permit based on assertions from the Virginia Chapter of the Sierra Club that the permit may be in violation of the Endangered Species Act (ESA). Because the NRC was, at that time, still engaged in informal consultations with the U.S. Fish and Wildlife Service (USFWS) under Section 7 of the ESA, the USACE indicated in a letter to Dominion (ML17057A003) that the permit is suspended until the NRC completes the ongoing ESA consultation process. The USFWS issued a letter dated February 22, 2017 (ML17058B064), concurring that the project is not likely to adversely affect any listed species or habitats. Receipt of the concurrence letter closed the NRC’s Section 7 consultation with the USFWS. As a result, the staff expects that the USACE will reinstate the permit, including its previous permit conditions that require Dominion to implement the mitigation measures upon which staff relied on for impact determinations. Therefore the staff expects that the permit suspension will have no effect upon the conclusions in the COL SEIS.

- 23. On February 4, 2017, a member of the public filed a comment on the public docket that raised concerns with whether the need for power analysis in Chapter 8 of the Final SEIS met the guidance of NUREG-1555 (available at ML17037D071). Because the Applicant did not address its need for power in the ESP proceeding, it is within the scope of the COL review. Please respond to the arguments made in the public comment.**

Staff Response: The commenter stated that because the Pennsylvania-New Jersey-Maryland Interconnection LLC (PJM) analysis that formed the basis for the staff’s acceptance did not include a baseload forecast, the applicant performed its own baseload analysis of the need for power and, therefore, “due to the fact that the need for power assessment likely does not meet the requirement of ‘independently produced,’ I do not believe that NUREG-1555 was followed.” Further clarification by the commenter makes the assertion that there is “significant doubt as to whether staff met the standard of NUREG-1555 (which allows staff to skip the step of assessing for itself the need for power analysis ONLY if the analysis provided by the applicant is independently produced), and especially whether staff met the ‘hard look’ standard required by NEPA [emphasis by commenter].”

The NRC’s guidance for applicants developing ERs for power reactors is Regulatory Guide 4.2, “Preparation of Environmental Reports for Nuclear Power Stations.” This guidance does not require an applicant to obtain an analysis from an independent third party or prohibit the applicant from performing any need for power analysis in-house.

Staff’s guidance document for EISs is NUREG-1555, “The Environmental Standard Review Plan, Standard Review Plans for Environmental Reviews for Nuclear Power Plants” (ESRP). The ESRP does not mandate any specific algorithms, processes, or analyses. Instead, on the title page of each ESRP it clearly states:

Environmental standard review plans are prepared for the guidance of the Office of Nuclear Reactor Regulation staff responsible for environmental reviews for nuclear power plants. These documents are made available for the public as part of the Commission’s policy to inform the nuclear industry and the general public of regulatory

procedures and policies. Environmental standard review plans are not substitutes for regulatory guides or the Commission's regulations and compliance with them is not required. The environmental standard review plans are keyed to Preparation of Environmental Reports for Nuclear Power Stations.

NUREG-1555 contains detailed requirements for the quality of any information that staff relies upon in its need for power analysis. ESRP 8.1 offers the following guidance with regards to external studies:

Affected States and/or regions are expected to prepare a need-for-power evaluation. NRC will review the evaluation and determine if it is (1) systematic, (2) comprehensive, (3) subject to confirmation, and (4) responsive to forecasting uncertainty. If the need for power evaluation is found acceptable, no additional independent review by NRC is needed, and the analysis can be the basis for ESRPs 8.2 through 8.4.

As part of their analyses of the need for power, States and/or regional authorities are expected to describe and assess the regional power system. The reviewer should evaluate the description and determine if it is comprehensive and subject to confirmation (pages 8.1-2 to 3).

The staff has the option to generate all of the data and reports that would be needed to fully assess a need for power—a complex and time consuming task. Alternatively, the staff is free to rely upon the work performed by the applicant in its ER or by an independent third party, so long as it meets the four reliability criteria of being systematic, comprehensive, subject to confirmation, and responsive to forecasting uncertainty.

As discussed in Section 8.5 of the COL SEIS, the staff determined that the Dominion analysis was reasonable. Therefore, the staff appropriately applied its NUREG-1555 guidance in performing its need for power assessment and there is no conflict or error in the staff or the applicant having relied upon an analysis that the applicant performed in-house. In addition, the staff has remained cognizant of changes that have occurred since the COL SEIS was published that could affect the need for power conclusion and has determined that there is no new information that would warrant a supplement to the COL SEIS.

The staff reviewed the information provided by the commenter and concluded that the commenter's methodology included assumptions that are inconsistent with standard practice in estimating the need for power, and as a result led to incorrect conclusions. For example, the commenter included pumped storage and hydroelectric generators as baseload generators to argue that the region had an excess of baseload generating capacity. Neither of these sources is considered baseload because, based on the 2015 Virginia State Electricity Profile published by the U.S. Department of Energy, Energy Information Administration, these types of generators operated on average at only 15 percent of their rated capacity. Accordingly, the comment does not alter any of the conclusions in the COL SEIS.

24. Describe the Applicant's process for review of new and potentially significant information both between the ESP and COL applications and after the Final SEIS was published.

Staff Response: Response to be submitted by the applicant only.

25. Describe the issues that the Staff considered for its review of new and potentially significant information since publication of the Final SEIS in 2010.

Staff Response: The staff looked for new and potentially significant information across the full spectrum of resources that were addressed in the COL SEIS issued in March 2010. Approximately 50 new information items were identified by the staff to review for significance with respect to prior evaluations. The staff did not identify any new information that provided a seriously different picture of the environmental impacts compared to that in the COL SEIS.

The more notable issues evaluated by the staff are summarized below:

Continued Storage Rule

The NAPS ESP EIS, issued in December 2006, and the COL SEIS were published before the revised continued storage rule and NUREG-2157 were published in 2014. The staff therefore considered the impact determinations incorporated from NUREG-2157, together with the analysis already in the ESP EIS and the COL SEIS, to determine whether a supplement to the COL SEIS was required in accordance with 10 CFR 51.92(a). The staff concluded that, as stated in NUREG-2157, the most likely impacts of continued storage would be those associated with at-reactor storage during the short-term timeframe and that the impacts of such storage would be SMALL.

Endangered Species

New issues concerning threatened and endangered species listed under the ESA have arisen since completion of the COL SEIS. First, the National Marine Fisheries Service (NMFS) has since listed the Chesapeake Bay Distinct Population Segment of the Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*), whose range includes portions of the Mattaponi River subject to use by barges carrying reactor components for Unit 3, as endangered under the ESA. Second, the USFWS has since listed the northern long-eared bat (*Myotis septentrionalis*), whose range includes the landscape surrounding the NAPS site, as threatened under the ESA. Third, the public has raised new concerns over the potential for barge traffic carrying Unit 3 reactor components on the Mattaponi River to adversely affect sensitive joint vetch (*Aeschynomene virginica*), a plant listed as threatened under the ESA which inhabits tidal marshes and shorelines bordering the river. Additionally, the staff had to consider the potential effects of the North Anna Unit 3 project as a whole on species and conditions identified as potentially present in the years subsequent to issuance of the COL SEIS.

The NRC staff's evaluation of potential effects of the North Anna Unit 3 project on each threatened or endangered species potentially occurring in the areas of the project is contained in a Biological Assessment (BA) prepared for the NMFS (ML16082A287) and a Supplemental BA prepared for the USFWS (ML16312A319). The staff concluded that the project either would have no effect; or may affect, but would not likely adversely affect; each species evaluated.

Historic and Cultural

Staff reviewed the survey reports and the interactions between Dominion and VDHR that occurred since the COL SEIS was issued. Dominion provided its Cultural Resource Management Plan in an RAI response dated August 10, 2011 (ML11224A116). In a letter dated October 3, 2014, the VDHR concluded consultations based on Dominion carrying out certain commitments that it made (ML16172A193 and ML11298A131). These commitments stated in the letter are included as a license condition in the staff's proposed Environmental Protection Plan in the draft COL. Based on Dominion's actions to continue to observe its commitments to the NRC and the capture of commitments in the NRC COL, the staff determined that the impact evaluations in the COL SEIS remain valid.

Barge Roll-off Facility and the Large Component Transport Route

The staff evaluated new information related to Dominion's proposed use of barges to transport large reactor components up the Mattaponi River to Walkerton, Virginia, where Dominion would build and operate a temporary roll-off facility to transfer the components from the barges to trucks for final transport to the site. The staff learned of much of the new information from Dominion's application for a Section 404 Clean Water Act permit for the North Anna Unit 3 project subsequent to the COL SEIS. The staff performed an integrated evaluation of potential direct, indirect, and cumulative environmental impacts from the barging of large reactor components on the Mattaponi River, transfer of the components to trucks, and trucking the components to the NAPS site. The staff determined that the new information was not significant for any of seven potentially impacted resource areas (land use, hydrology, terrestrial ecology, aquatic ecology, socioeconomics and environmental justice, historic and cultural resources, and air quality). Additional details are provided in the staff response to Question 29.

- 26. The Staff relies on the analysis in NUREG-1437, Generic Environmental Impact Statement for License Renewal of Nuclear Plants, throughout the Final SEIS. E.g., Final SEIS at 9-3. As part of its review of new and significant information, did the Staff consider the intervening revision to NUREG-1437? If so, what was the result of that consideration; if not, does the revision to NUREG-1437 constitute new and significant information?**

Staff Response: Yes, the staff considered the revision to NUREG-1437 as part of its review of new and significant information. The revision to NUREG-1437 modified some information, but also continued to point back to the 1996 version for much information. While, the ESP EIS and the COL SEIS refer to the 1996 version of NUREG-1437 in a number of locations, the staff evaluated the revisions to NUREG-1437 and determined that these revisions would not change any of the staff's conclusions. Accordingly, the staff concluded the revision to NUREG-1437 did not warrant a supplement to the COL SEIS.

- 27. The Final SEIS states that for new information discovered after issuance of the ESP EIS to be considered significant, and therefore addressed in the SEIS, "it must be material to the issue being considered; that is, it must have the potential to affect the finding or conclusions of the NRC [S]taff's evaluation of the issue." Final SEIS at 1-5. In the Staff's memoranda considering whether new information constitutes new and significant information, the Staff concludes that the standard for triggering a**

supplemental EIS is whether the new information presents a “seriously different picture of the environmental impacts when compared to the impacts described in the [Draft SEIS].” Please describe in more detail the relationship between these two standards.

Staff Response: Supplementing an ESP EIS and deciding whether to supplement a final COL EIS are procedurally distinct and governed by different regulations. The legal standard for a supplement to an ESP EIS is found in 10 CFR 51.92(e). Identifying and analyzing new and significant information is a part of preparing a COL EIS that incorporates an ESP EIS, as specified in 10 CFR 51.92(e)(7). In August 2007 the NRC issued amendments to its regulations for Licenses, Certifications, and Approvals for Nuclear Power Plants (72 FR 49352). The Statement of Considerations (SOC) for that rulemaking (page 49431) states that, in the context of a COL that references an ESP, the standard that the applicant and the staff are to apply in determining whether information is “new and significant” is whether the information has the potential to affect the finding or conclusion of the staff’s evaluation of the issue as presented in the ESP EIS.

The Introduction of the ESRP, which was revised and issued for use and comment in 2007 (ML071860393), is consistent with the aforementioned 2007 rulemaking. The ESRP provides additional guidance that describes the relationship between an ESP EIS and a COL SEIS as a special case of the more general situation where staff uses information and conclusions from an earlier review that was developed with the intent of supporting the current review. In these situations, a new EIS (or an SEIS) is already being prepared, and the standard for significance is not to determine whether the new information warrants an additional NEPA document, but whether, in the context of the current review, the staff should consider the new information before the previous conclusions are adopted.

The legal standard for deciding whether to supplement a completed COL EIS is in 10 CFR 51.92(a). The process the staff uses to identify and evaluate potentially significant information for this purpose is currently documented in a guidance document, “Staff Process for Determining if a Supplement to an Environmental Impact Statement is Required in Accordance with Title 10 of the *Code of Federal Regulations*, Part 51.92(a) or 51.72(a)” (ML13199A170). 10 CFR 51.92(a) requires that an EIS or SEIS be supplemented if there are substantial changes in the proposed action that are relevant to environmental concerns or if there are new and significant circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. As described in this guidance document, the Commission has stated that for the purposes of determining whether a supplemental EIS is warranted, new information is significant if it presents a seriously different picture of the environmental impact of the Federal action or reveals previously unanalyzed impacts.³

The North Anna COL review presents a situation where both of these processes were utilized at different stages of the review. While the particular standard influences the information that is included in the final NEPA document, the staff’s efforts for the identification of new information and the evaluation of its significance, in both situations, was robust and documented.

³ See *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-06-03, 63 NRC 19, 28 (2006); *Hydro Resources, Inc.* (Albuquerque, NM), CLI-99-22, 50 NRC 3, 14 (1999) (citing *Marsh v. Oregon Natural Resources Council*, 490 U.S. 360, 373 (1989)).

28. **As part of the Staff's environmental review following publication of the Final SEIS, it took into consideration the analysis provided in the Continued Storage GEIS (ML15254A426). In its analysis, the Staff notes that the impacts assessed in the Continued Storage GEIS are deemed incorporated into a COL EIS. The analysis references the Continued Storage GEIS § 4.20, table 4-2, where the impacts are summarized for each resource area and each timeframe. For special status species and habitats, the Staff concluded in the Continued Storage GEIS that "[i]mpacts on Federally listed threatened and endangered species and Essential Fish Habitat would be determined as part of the consultations for the ESA and Magnuson-Stevens Fishery Conservation and Management Act."**

How did the Staff's consultations with the U.S. Fish and Wildlife Service consider the impacts of continued storage on special status species and habitats?

Staff Response: There was no specific discussion between the staff and the USFWS of a future ISFSI for the new unit, nor is there any such discussion in the EISs for either the North Anna 3 ESP or the COL. Rather, the impacts of spent fuel storage on site are addressed more generally in Sections 6.1 of the EIS for the ESP and Section 6.1 of the SEIS for the COL. As discussed in the staff's evaluation of the revised continued storage rule for the North Anna COL (ML15254A426), the staff considered the information in the continued storage GEIS (NUREG-2157) and concluded that the information did not warrant a supplement to the COL SEIS.

The staff completed its consultations under the ESA and Magnuson-Stevens Fishery Conservation and Management Act for essential fish habitat (EFH) for the COL. These consultations covered the areas of the site on which the staff would expect impacts from plant building and operation. Because an ISFSI would be built on land, and because typical controls (e.g., the National Pollutant Discharge Elimination System (NPDES) permit) would protect nearby waters, the staff does not expect any impacts to EFH. If any future ISFSI is built and operated on lands previously disturbed by building and operation of the plant facilities, the staff expects that any adverse effects from the ISFSI on threatened or endangered species is also unlikely.

When the NRC issues a COL, 10 CFR 72.210 also authorizes the licensee to build and operate an ISFSI under a general license. If a COL licensee chooses to build an ISFSI under a general license, then the NRC has no licensing action at the time the ISFSI is built. It cannot, therefore, initiate consultation under ESA.

However, to protect listed species and habitat, the proposed EPP in the North Anna draft COL includes a condition related to threatened or endangered species that reads, in part, "If any Federally listed species or critical habitat occurs in an area affected by construction or operation of the plant that was not previously identified as occurring in such areas, including species and critical habitat that were not previously Federally listed, the licensee shall inform the NRC within four hours of discovery. ... Similarly, the licensee shall inform the NRC within four hours of discovery of any take, as defined in the ESA, of a Federally listed species or destruction or adverse modification of critical habitat." If, while building or operating an ISFSI under a general license, the licensee were to find that this activity could affect endangered

species or critical habitat, then it would inform the NRC. The NRC staff will then inform the affected Service of the issue.

29. Please provide a public discussion of the process the Staff used to review new and potentially significant information regarding cumulative impacts. Did the Staff consider the cumulative impacts of other federal and state projects during the preview process? Specifically, please clarify the Staff's cumulative impacts analysis in the consideration of new information regarding transport of large reactor components.

Staff Response: Recognizing that the NRC staff completed the COL SEIS in 2010 and that the applicant had since developed greater detail regarding certain project activities, the staff evaluated the North Anna Unit 3 project in its entirety in 2016 for new and potentially significant information that could warrant preparation of a supplement to the COL SEIS. Issues addressed in the staff's comprehensive consideration of new and potentially significant information included but was not limited to updated threatened and endangered species considerations, updated need for power considerations, and updated project information developed by the applicant for the USACE regarding the transport of large reactor components by barge and truck. The staff's consideration extended to potential direct, indirect, and cumulative environmental impacts not specifically considered in the COL SEIS, including cumulative impacts resulting from other past, concurrent, and reasonably foreseeable Federal and state (and other) projects. Following its normal procedures for considering cumulative impacts, the staff reviewed NEPA-related databases, Dominion's integrated resource management plan, and state and local websites to identify other projects whose environmental impacts could potentially affect the same resources as the North Anna Unit 3 project. The staff did not discover any reasonably foreseeable Federal, state, or other projects that would affect the staff's conclusions regarding cumulative impacts. Upon completion of the efforts described above, the staff did not identify any new and significant information warranting preparation of a supplement to the COL SEIS.

In its evaluation of new and significant information for the NAPS Unit 3 project in 2016, the staff considered potential direct, indirect, and cumulative impacts from the applicant's proposed process for transporting large reactor components by barge and truck to the site. The staff performed an integrated assessment of the potential environmental impacts from barging large reactor components up the Mattaponi River to Walkerton, building and operating a temporary roll-off facility on the south shore of the Mattaponi River at Walkerton for transferring the reactor components from barges to trucks, and trucking the reactor components over a network of existing highways from Walkerton to the NAPS site near Louisa, Virginia. The staff's assessment of impacts from barging reactor components considered the potential for erosion of tidal marshes and shorelines caused by wakes and the potential for resuspension of sediments should barges run aground or deviate from the navigation channel. The staff's assessment of impacts from the roll-off facility at Walkerton was based on the design provided to the USACE in Dominion's application for a Section 404 Clean Water Act permit and was bounded by several assumptions based on the permit application and discussions with Dominion during the staff's June 2016 audit of Dominion's process for identifying and evaluating new information since the issuance of the COL SEIS (ML16288A846). The staff's assessment of impacts from trucking the reactor components accounted for specific road improvements identified as necessary by Dominion, including upgrades to ramps where Virginia Route 30 crosses Interstate Route 95, installation of a new temporary bridge where Virginia Route 30 crosses the North Anna River, and installation of

temporary steel plating and crane mats over multiple culverts under existing roadways. The staff's evaluation accounted for possible cumulative impacts increased by interaction between project activities and other barge traffic on the Mattaponi River and vehicular traffic on the roads used by trucks carrying reactor components. The staff did not identify any new and significant information warranting preparation of a supplement to the COL SEIS.

30. Please provide a public description of the Staff's efforts to consider new and significant information associated with the SAMA analysis. What, if any, significant challenges did the Staff identify while conducting this analysis?

Staff Response: Since the completion of the North Anna Unit 3 COL SEIS (ML100680117), new information has become available to the staff which could have, but ultimately did not, affect the prior severe accident mitigation alternatives (SAMA) analysis.⁴ The new information sources include (1) the updates and revisions to the ESBWR design certification (DC); (2) updates to Dominion's Environmental Report (ER); (3) the results in the staff's Safety Evaluation Report for the seismic safety review as informed by the Fukushima recommendations and the August 2011 earthquake in Mineral, Virginia; and (4) a severe accident risks sensitivity analysis based on the May 4, 2016, Commission decision in the Indian Point license renewal proceeding (CLI-16-07; ADAMS Accession No. ML16125A150). While the staff did not encounter any significant challenges when conducting this analysis, the staff did need to request additional information from the applicant (ML16265A554) in order to complete the severe accident risks sensitivity analysis with respect to CLI-16-07.

New Information in the ESBWR DC

The staff reviewed the changes to the ESBWR DC information that have been submitted to the NRC since issuance of the final COL SEIS which are related to the SAMA analysis. The COL SEIS environmental findings for SAMA were based on Revision 6 of the ESBWR DCD, dated August 31, 2009 (ML092680561). On October 15, 2014, the NRC issued the ESBWR final rule in the Federal Register (79 FR 61944) based on Revision 10 of the ESBWR DCD, dated April 14, 2014 (ML14104A929). The staff reviewed revisions to the DCD that could affect the SAMA analysis, including the probabilistic risk assessment related to core damage frequencies, the postulated accident source terms, consequence analysis, and the revisions to the cost-benefit analysis of the severe accident management design alternatives (SAMDA) assessment. While there were changes in these areas between Revision 6 and Revision 10 of the ESBWR design certification documents, the staff evaluated these changes and determined that they were not significant enough to affect the SAMA finding in the COL SEIS, in part due to the significant margin that exists between the total averted cost and the lowest SAMA cost.

New Information in the Applicant's Environmental Report

As part of updating the ER for the conversion of the COL application back to the ESBWR design, the applicant re-assessed SAMAs from the prior ESBWR-based ER (ML092160490)

⁴ At the North Anna ESP stage, the environmental impacts from severe accidents were evaluated for several reactor designs selected by the applicant. Because no specific design was chosen, a SAMA analysis was not completed as part of the ESP review. With the selection of the ESBWR reactor design for the North Anna Unit 3 COL application, SAMAs were evaluated based on the detailed information for the ESBWR design and the site-specific information at the time of the COL application. However, the environmental finding for the consequences of severe accidents at the North Anna COL stage were a continuation from the North Anna ESP analysis as documented by the applicant's COL Environmental Report Section 7.2 and evaluated by the staff in the COL SEIS Section 5.10.2.

by applying information from the DCD revision associated with the ESBWR certification. However, while the applicant reached the same conclusions as were reached in the environmental finding of the COL SEIS (i.e., no cost-beneficial SAMDAs have been identified), the value of the averted costs for SAMAs now has a noticeably larger value. As will be discussed later in this response, this required the staff to request additional information from the applicant in order to complete the CLI-16-07 related sensitivity analysis.

Information Based on the Staff's Seismic Safety Review

As discussed in FSER Section 2.5.2.4.1, Probabilistic Seismic Hazard Analysis Updates (ML16336A150), the staff requested that the applicant evaluate the impacts of the August 2011 Mineral, Virginia earthquake and the recently developed Central and Eastern United States Seismic Source Characterization (CEUS SSC) model as documented in NUREG-2115, on the NAPS site-specific seismic hazard calculation.

As part of the staff's safety review and findings, the applicant demonstrated to the staff that the ESBWR seismic design response spectra are acceptable for the seismic hazard characteristics at the NAPS site. The conclusions, as documented in Section 2.5.2.4.1 of the North Anna 3 FSER, did not result in any significant changes to the design of the ESBWR reactor for the NAPS site such that it would affect the SAMA analysis. Thus, none of the information the staff has identified about the seismic hazards at the NAPS site, including the Mineral earthquake, would affect the prior analyses of severe accidents for the ESP EIS or the COL SEIS.

New Information Related to the Commission's Adjudicatory Decision CLI-16-07

On May 4, 2016, the Commission issued a decision (CLI-16-07; ML16125A150) in the Indian Point license renewal proceeding. The Commission found that none of the parties involved in the Indian Point license renewal SAMA contention could provide a documented description outlining the technical foundation for two inputs (the time to decontaminate, TIMDEC, and the cost to decontaminate non-farmland, CDNFRM) used by the MACCS computer code for the site-specific severe accident analyses in support of the Indian Point license renewal SAMA determination. The Commission directed the staff to perform additional sensitivity analyses varying the TIMDEC and CDNFRM input parameters using specific values.

The staff determined that the decontamination input values applied in the severe accident analysis that supported the North Anna Unit 3 COL SAMA had to be based on the same original values used in the Indian Point license renewal SAMA analysis. Therefore, the staff determined a sensitivity analysis was necessary to evaluate whether the changes in the decontamination cost and time recommended by the Commission may change the North Anna Unit 3 COL SEIS SAMA findings. To conduct a severe accident risks sensitivity analysis based on the May 4, 2016, Commission decision in the Indian Point license renewal proceeding (CLI-16-07) for North Anna, the staff performed additional sensitivity analyses varying the TIMDEC and CDNFRM input parameters using specific values based on the information and direction in CLI-16-07.

Using methodology similar to that described in the ESP EIS Section 5.10.2.1, "Severe Accidents," of NUREG-1811 (ML063480261 and ML063480263), the staff applied the latest version of the MACCS computer code for this sensitivity analysis. This analysis applies the ESBWR DCD reactor source-term information and NAPS site-specific meteorological, population, and land-use data. The staff applied revised non-farmland decontamination costs (\$24,000 for low contamination and \$100,000 for high contamination) and one year of

decontamination time for a revised site-specific severe accident offsite property damage cost in accordance with the Commission's direction in the CLI-16-07 decision. Based on this cost, the staff determined a revised maximum averted cost for both a 7 percent and 3 percent discount rate per NRC guidance in NUREG/BR-0058, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission," and NUREG/BR-0184, "Regulatory Analysis Technical Evaluation Handbook" (ML050190193, ML042820192).

The application of the higher decontamination costs and longer decontamination times did result in higher maximum averted costs for both discount rates. For internal and external events, the staff's revised maximum averted cost for the 7 percent discount rate value increases from \$2,892 in Table M-3 of Appendix M of the COL SEIS to approximately \$150,000. For the 3 percent discount rate, the staff's revised maximum averted cost for the same events increases from \$10,437 in Table M-3 of Appendix M of the COL SEIS to approximately \$305,000. Because the revised 7 percent and 3 percent discount rate results are still below the lowest design alternative's cost of \$1 million (see ESBWR DCD SAMDAs No. 52 and 96 in Table 1 of ML102990433), the ESBWR-related SAMDAs are still not cost beneficial.

Conclusions

In sum, the staff reviewed the revised ESBWR design certification documents, the revisions to the COL application since the issuance of the COL SEIS, the safety findings related to the seismic conditions at the site, and performed a SAMA sensitivity analysis consistent with Commission direction stemming from the Indian Point License Renewal decision to determine if the new information continues to support the technical basis for the severe accident and SAMDA analyses in the COL SEIS. Therefore, the findings of the staff's new and significant review regarding SAMAs found that this information does not present a seriously different picture of the environmental impacts of the proposed action when compared to the impacts that were described in the North Anna Unit 3 ESP EIS and the COL SEIS.

31. Describe the Staff's efforts and status of any consultations related to the Endangered Species Act Section 7 since publication of the Final SEIS. What is the status of the Staff's consultation with the U.S. Fish and Wildlife Service?

Staff Response: Since publication of the final COL SEIS, the staff (1) revisited the project site and visited other potentially affected areas, including the proposed large component transport route and roll-off facility location, (2) met informally in person with representatives of the USFWS, (3) participated in multiple telephone calls with the NMFS and USFWS, (4) performed updated technical research, and (5) participated in an audit with the applicant. The staff then completed a BA in 2016 to evaluate impacts to a species protected by the NMFS (ML16082A287) that was not listed when the COL SEIS was issued. The staff also completed a Supplemental BA to evaluate impacts of the project to species protected by the USFWS (ML16312A319). The Supplemental BA updated an earlier BA that the staff had completed for the USFWS in 2005 while preparing the EIS for the ESP (ML050320461).

The two BA documents that the staff completed in 2016 address possible effects on threatened or endangered species considering everything known by the staff about the project as of 2016, including additional details concerning the transport of large reactor components that had not been presented by the applicant to the staff as of preparation of the COL SEIS in 2010. The 2016 BA documents also update the staff's assessment of impacts to threatened or

endangered species for other project elements such as the proposed plant site, transmission line right-of-way, and offsite lands referred to by the applicant as the Route 700 parcels.

In its two BA documents, the staff concluded that the project may affect, but was not likely to adversely affect the Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*), sensitive joint-vetch (*Aeschynomene virginica*), and northern long-eared bat (*Myotis septentrionalis*). The staff concluded that the project would not affect any of the other threatened or endangered species known to occur in the area of the project. The staff also prepared a determination dated December 14, 2016, that the updated review regarding threatened or endangered species does not constitute new and significant information warranting the need to prepare a supplement to the COL SEIS (ML16342B179).

The NMFS issued a letter dated November 3, 2016 (ML16319A265), concurring with the staff's determination that the project is not likely to adversely affect the Atlantic Sturgeon, closing the NRC's consultation with that agency under Section 7 of the ESA. The USFWS issued a letter dated February 22, 2017 (ML17058B064), concurring in the staff's determination that the project is not likely to adversely affect any listed species or habitats. Receipt of the USFWS concurrence letter closed the NRC's Section 7 consultation with the USFWS.

March 2, 2017

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE COMMISSION

In the Matter of)
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DOMINION VIRGINIA POWER) Docket No. 052-017-COL
)
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(North Anna Nuclear Power Station, Unit 3))

CERTIFICATE OF SERVICE

I hereby certify that the document entitled NRC STAFF RESPONSES TO COMMISSION PRE-HEARING QUESTIONS, dated March 2, 2017, has been filed through the E-Filing system this 2nd day of March, 2017.

/Signed (electronically) by/
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Dated at Rockville, Maryland
This 2nd day of March 2017