June 13, 2008

Mr. Eugene S. Grecheck
Vice President - Nuclear Development
Dominion
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 009 (SRP SECTION 08.02) RELATED TO THE NORTH ANNA UNIT 3 COMBINED LICENSE APPLICATION

Dear Mr. Grecheck:

By letter dated November 26, 2007, Dominion Virginia Power (Dominion) submitted a combined license application for North Anna Unit 3 pursuant to 10 CFR Part 52. The Nuclear Regulatory Commission (NRC) staff is performing a detailed review of this application.

The staff has identified that additional information is needed to continue portions of the review and the request for additional information (RAI) is contained in the enclosure to this letter. To support the review schedule, Dominion is requested to respond within 45 days of the date of this letter. If the RAI response involves changes to application documentation, Dominion is requested to include the associated revised documentation with the response.

Should you have questions, please contact me at (301) 415-0224 or Thomas.Kevern@nrc.gov.

Sincerely,

/RA/

Thomas A. Kevern, Senior Project Manager
ESBWR/ABWR Projects Branch 1
Division of New Reactor Licensing
Office of New Reactors

Docket No. 52-017

Enclosure: Request for Additional Information

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Vice President - Nuclear Development
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Enclosure: Request for Additional Information
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DATE	04/16/2008	04/16/2008	05/19/2008	06/13/2008	06/13/2008

*Approval captured electronically in the electronic RAI system.

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Request for Additional Information
North Anna, Unit 3
Dominion
Docket Number 52-017
SRP Section: 08.02 – Offsite Power System
Application Section: FSAR Chapter 1 and Section 8.2

QUESTIONS

08.02-1

Staff review of FSAR Chapter 8 Figure 8.2-201 indicates a discrepancy with corresponding DCD Rev. 4 Figure 8.1-1. In Figure 8.1-1, main generator circuit breaker is shown as part of onsite power system while the same breaker is shown in intermediate switchyard in Figure 8.2-201. Also, in Figure 8.1-1, main transformer and unit auxiliary transformers (UATs) are connected at the high voltage side of main transformer; however, in Figure 8.2-201, UATs high side voltage is 230 kV and main transformer's high side voltage is 500 kV and it is not clear how the connection can be made with different voltages. Please clarify the apparent discrepancies.

08.02-2

FSAR Section 8.2.1.2 addresses the routing of power cables. DCD, Rev. 4, Section 8.2.3 states that the normal preferred circuit and alternate preferred circuit are electrically independent and are physically separated from each other. Staff review indicates that Section 8.2.1.2 does not address the independence and separation of control and instrumentation cables. Please provide a discussion regarding the routing of control and instrumentation cables, and miscellaneous power cables associated with normal and alternate preferred circuits, between the switchyard and the power block.

08.02-3

FSAR Section 8.2 Figure 8.2-201 includes an intermediate transformer located in intermediate switchyard. Please provide the MVA rating of the intermediate transformer.

08.02-4

FSAR Section 8.2.1.2 states that underground cables connect the normal and alternate preferred power sources to the UATs and reserve auxiliary transformers (RATs). Since underground cables are susceptible to moisture, please identify the design features and/or in-situ monitoring programs that will be implemented to avoid or arrest the degradation of the cable insulation from the effects of moisture.

08.02-5

FSAR Section 8.2.1.2 identifies that the 500 kV transmission line rated current is 3954 amps and the 500 kV bus is rated as 3891 amps. Please explain why the bus rating is less than the transmission line rating and clarify the actual loading of the line and bus.

08.02-6

FSAR Section 8.2.1.2.2 states that all transformers are protected with differential and over-current relay schemes. Information Notice 2005-15 addresses provision of sudden pressure relay and ground fault protection for transformers. Please discuss provision of such transformer protection. In addition, if the transformer neutrals are high-resistance grounded, please discuss what monitoring schemes are implemented for detection of ground faults in the system.

08.02-7

FSAR Section 8.2.1.2.2 addresses protective relaying. DCD, Rev.4, Section 8.2.4, Item 8.2.4-5-A identifies that the COL applicant is responsible for switchyard protective relaying and will ensure such relaying is coordinated, reviewed, and accepted by the applicable grid reliability organization. Please discuss how such coordination, review, and acceptance by the applicable grid reliability organization is to be accomplished.

08.02-8

FSAR Section 8.2. Please discuss the industry (FERC, NERC, and IEEE) standards that will be followed for switchyard protection system, monitoring, maintenance and testing. In addition, please confirm that generator circuit breakers will meet the requirements of IEEE Standard C37.013.

08.02-9

FSAR Section 8.2. Please address inclusion of transformer testing as part of the overall routine switchyard component testing.

08.02-10

FSAR Section 8.2.2.1 states “The analysis examined conditions involving loss of the largest generating unit, loss of the most critical transmission line, and multiple facility contingencies.” Please clarify that the analysis addressed multiple facility contingencies (e.g., the analysis included tripping of all three nuclear units).

08.02-11

FSAR Section 8.2.2.1 states that stability analysis did not consider the 34.5 kV portion of the North Anna switchyard. The staff review identified the station auxiliary loads for all three units to be substantial. Please provide the basis, including identifying connected total (three units) station auxiliary loads, for excluding analysis of the 34.5 kV portion of the switchyard.

08.02-12

FSAR Section 8.2.2.1 states that grid availability in the region over the past 20 years was examined and it was confirmed that the system has been highly reliable with minimal outages due to equipment failure. Please provide supporting information for this statement to include the frequency, duration, and causes of outages over the past 20 years for both the transmission system accepting the unit's output and the transmission system providing the preferred power for the unit's load.

08.02-13

FSAR Section 8.2.2.1 states that "Upon approaching or exceeding a limit, these procedures verify availability of required and contingency equipment and materials, direct notifications to outside agencies and address unit technical specifications (TS) actions until the normal voltage schedule can be maintained." Since the FSAR does not identify TS for the offsite power system, please clarify the reference to TS in this Section 8.2.2.1 statement.

08.02-14

FSAR Section 8.2.2.1 states that the system impact study was prepared using 2011 summer light-load and 2014 summer base-case projections. Please provide the basis for using 2011 summer light-load and 2014 summer base-case projections rather than the summer heavy-load projections and clarify whether the summer loads bound winter peak loads.

08.02-15

Staff review of FSAR Section 8.2.2.1 indicates this section does not address the grid frequency variation. Please identify the maximum and minimum grid frequency. In addition, please discuss how the auxiliary power system studies consider the combined effect of frequency and voltage variation on the operation of safety-related loads (safety-related battery chargers and safety-related UPS) and other running motor loads.

08.02-16

FSAR Chapter 1, Table 1.9-201, "Conformance with Standard Review Plan" for SRP Section 8.2, indicates GDC-5 is not applicable. DCD, Rev. 4, Section 8.2.2.2 states that the ESBWR Reference Plant is designed as a single-unit plant and, therefore, GDC-5 is not applicable. However, the staff notes that the North Anna Unit 3 switchyard is shared with Units 1 & 2 and, therefore, GDC-5 would be applicable. Please clarify the applicability of, and conformance with, GDC-5.

08.02-17

FSAR Chapter 1, Table 1.9-201, “Conformance with Standard Review Plan” for SRP Section 8.2, indicates GDC-4 is not applicable. However, RG-1.206 (C.I.8.2.1) states that the FSAR should address conformance with GDC-4. Please provide a discussion to clarify conformance with GDC-4 or the basis for not conforming with GDC-4.

08.02-18

FSAR Chapter 1, Table 1.9-201, “Conformance with Standard Review Plan” for SRP Section 8.2 indicates that North Anna 3 conforms to GDC-2. However, staff review of Chapter 8 identified no discussion regarding GDC-2. Please clarify conformance with GDC-2.

08.02-19

FSAR Chapter 1, Table 1.9-201, “Conformance with Standard Review Plan” for SRP Section 8.2 indicates that North Anna 3 complies with the requirements of 10 CFR 50.65(a)(4). However, the staff review of Chapter 8 identified no discussion regarding 10 CFR 50.65. Please clarify compliance with the requirements of 10 CFR 50.65(a)(4).

08.02-20

FSAR Chapter 1, Table 1.9-201, “Conformance with Standard Review Plan” for SRP Section BTP 8-3, indicates that BTP 8-3, “Stability of Offsite Power System,” is not applicable. However, DCD, Rev 4, Section 8.2.4, “COL Information,” identifies that the COL applicant will address the stability and reliability of the offsite transmission system. Please revise Table 1.9-201 to indicate applicability of BTP 8-3 or justify that BTP 8-3 is not applicable.

08.02-21

FSAR Chapter 1, Table 1.9-201, “Conformance with Standard Review Plan” for SRP Section BTP 8-5 indicates that BTP 8-5, “Supplemental Guidance for Bypass and Inoperable Status Indication for Engineered Safety Features System” is not applicable. However, DCD, Rev. 4, Section 8.3.2.2.2 indicates that BTP ICSB 21, “Supplemental Guidance for Bypass and Inoperable Status Indication for Engineered Safety Features System,” is applicable. Note that the NRC has updated BTP ICSB 21 as BTP 8-5. Please revise Table 1.9-201 to indicate BTP 8-5 is applicable.

08.02-22

FSAR Chapter 1, Table 1.9-201, “Conformance with Standard Review Plan” for SRP Section BTP 8-6 indicates that BTP 8-6, “Adequacy of station Electric Distribution System Voltage” is not applicable. However, DCD, Rev. 4, Section 8.3.1.1.2 indicates that BTP PSB 1, “Adequacy of Station Electric distribution System Voltage,” is applicable. Note that the NRC has updated BTP PSB 1 as BTP 8-6. Please revise Table 1.9-201 to indicate BTP 8-6 is applicable.

08.02-23

DCD, Rev 4, Section 8.2.3 states that a transmission system reliability and stability review of the site-specific configuration to which the plant is connected will be performed to determine the reliability of the offsite power system and verify that it is consistent with the analysis of Chapter 19. Please clarify the the manner in which verification of the reliability of the offsite power system to be consistent with the analysis of Chapter 19 is performed.

08.02-24

DCD Section 8.2.3 states that a station ground grid is provided that consists of a ground mat below grade at the switchyard that is connected to the foundation embedded loop grounding system provided for the entire power block and associated buildings. Please provide a description of the station ground grid.

08.02-25

SRP 8.2 (III.1.I) identifies the need to address provisions for surge protection and lightning protection. Staff review of Chapter 8 did not identify that these issues were addressed. Please provide a discussion of the adequacy of surge protection and lightning protection of offsite power system.

08.02-26

SRP 8.2 identifies the need to address grid instability relative to the nuclear unit. Please identify, and provide detailed discussion as applicable, any effects on the operation (e.g., minimum and maximum grid voltage, degraded voltage) of the existing nuclear Units 1 & 2 due to the addition of Unit 3 to the grid.