

August 12, 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. 025 (SRP  
SECTIONS: 02.02.03, 03.05.01.05, 12.02, AND 15.06.05) 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](mailto: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

August 12, 2008

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Vice President - Nuclear Development  
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(SRP SECTIONS: 02.02.03, 03.05.01.05, 12.02, AND 15.06.05) RELATED TO  
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Enclosure: Request for Additional Information

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| DATE   | 07/24/08  | 07/24/08 | 07/24/08     | 08/11/08  | 08/12/08     |

\*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 Sections: 02.02.03 - Evaluation of Potential Accidents; 03.05.01.05 - Site Proximity  
Missiles (Except Aircraft); 12.02 - Radiation Sources; 15.06.05 - Loss-of Coolant  
Accidents Resulting From Spectrum of Postulated Piping Breaks Within the Reactor  
Coolant Pressure Boundary Application:  
FSAR Sections 2.2.3, 3.5.1.5, 12.2.2.2, 15.6**

QUESTIONS

02.02.03-1

10 CFR 52.79(a)(1)(vi) requires a safety assessment of a site to determine its suitability for building a reactor on that site. COL Information Item 2.0-6-A related to evaluation of potential accidents to be covered under ESP COL Action item 2.2-2 is one facet of that safety assessment. The NRC staff noticed that there are two 10,000 gallon underground gasoline storage tanks identified on-site with Unit 3 in FSAR Table 2.2-202. The applicant did not address these tanks for hazard consideration due to either confined vapor explosion or flammable vapor cloud explosion. Provide the potential explosion hazard due to these tanks from the perspective of fuel storage and delivery of fuel to the tanks onsite.

02.02.03-2

10 CFR 52.79(a)(1)(vi) requires a safety assessment of a site is needed to determine suitability of building a reactor on that site. COL Information Item 2.0-6-A related to evaluation of potential accidents to be covered under ESP COL Action item 2.2-2 is one facet of that safety assessment. Provide the bases and methodology for calculating the toxic chemical concentrations at the intake of control room, and potential toxic chemical concentration inside the control room with potential air flow rates. Also provide the modeling assumptions and inputs for accidental chemical release scenarios and evaporation characteristics, dispersion and transport mechanisms, distances to control room, and resulting concentrations both at intake to control room and also in the control room if the intake to control room concentration exceeds the limiting concentration. Such detail is needed for the staff to perform confirmatory calculations.

02.02.03-3

10 CFR 52.79(a)(1)(vi) requires a safety assessment of a site is needed to determine suitability of building a reactor on that site. COL Information Item 2.0-6-A related to evaluation of potential accidents to be covered under ESP COL Action item 2.2-2 is one facet of that safety assessment. Provide justification (on the basis of sensitivity analysis), in selecting limiting meteorological conditions that would give the highest chemical release (e.g., evaporation rate) in conjunction with conditions impacting dispersion of vapor plume to give highest chemical concentrations at the intake of control room. Note that the set of meteorological conditions resulting in the limiting rate of release may not be same as those resulting in the limiting dispersion of the effluent. Depending on the methodology used, release scenario applied, chemical considered lower wind speed and

stable atmospheric conditions may not always ensure estimation of limiting concentration.

02.02.03-4

In accordance with 10 CFR 52.79(a)(1)(vi) a safety assessment of a site is needed to determine suitability of building a reactor on that site. COL Information Item 2.0-6-A related to evaluation of potential accidents to be covered under ESP COL Action item 2.2-2 is one facet of that safety assessment. The quantity of sodium hydroxide in PANS 3 FSAR Table 2.2-202 is 180 gallons and is not analyzed for toxicity, whereas PANS 1 and 2 UFSAR version 42 (Table 6.4-1) gives sodium hydroxide quantity of 55 gallons, and is analyzed for toxicity. It has control room concentration of 7.73 mg/m<sup>3</sup> compared to limiting concentration of 10 mg/m<sup>3</sup>. Please clarify the discrepancy and correct if required for PANS 3 FSAR.

03.05.01.05-1

10 CFR 52.79(a)(1)(vi) requires the applicant to do a safety assessment of the site on which the facility is to be located. Further RG 1.206 C.I.3.5.1.3 *Turbine Missiles* requires an assessment of the vulnerability of safety systems, structures and components from plant generated missiles. Provide an assessment of the potential for the turbine missiles generation for existing Units 1 and 2 effecting the safe operation of proposed Unit 3.

12.02-10

Staff review of the applicant's proposed revision to FSAR Section 12.2.2 (reference Dominion Letter NA3-08-043 (4/28/08) in response to NRC RAI 12.02-1) indicates internal inconsistencies in the presentation of FSAR data and dose results supporting the demonstration of regulatory compliance. Specifically, the applicant is requested to address and resolve the following items:

- (a) In demonstrating consistency with the unity rule of Table 2 (Column 1) of Appendix B to Part 20, add a listing to FSAR Table 12.2-17R showing the ratio of each radionuclide and sum-of-the-ratios for all radionuclides. Currently, the tabulation does not present the sum-of-the-ratios.
- (b) The staff's evaluation and analyses generally concur with dose results presented in FSAR Table 12.2-18bR. However, the following observations were noted: (i) the applicant's dose associated with plume exposure at the nearest residence is nearly 1.5 times higher than the staff's estimate; and (ii) in confirming consistency with Part 50 Appendix I, Section II design objectives, the applicant is requested to revise footnote 4 to state that the reported dose includes exposures from plume and ground shine contributions.
- (c) Address and resolve the following items in FSAR Tables 12.2-203 and 12.2-204: (i) the presentation of dose results for North Anna Unit 3 should note whether the listed dose results include the incremental dose contribution from turbine building skyshine associated with the use of hydrogen water chemistry (as described in FSAR Section 9.3.9) in demonstrating consistency with Part 20.1301(e); (ii) confirm whether the

new total body doses reported for the existing units (6<sup>th</sup> column of table) need to be identified in the Departure Report (Part 7 of the North Anna Unit 3 application) given that they are higher by a factor of about 5 when compared to the corresponding information presented in ER Table 5.4-11 of the North Anna ESP (Rev. 9, Sept. 2006); (iii) the applicant should confirm whether changes in the basis of collective population doses need to be identified in the Departure Report (Part 7 of the North Anna Unit 3 application) when compared to the information and data presented in North Anna ESP (Rev. 9, Sept. 2006); and (iv) the applicant should confirm that the data presented in ER Tables 5.4-1, 5.4-3, and 2.5-8 of the North Anna ESP (Rev. 9, Sept. 2006) are still valid in terms of the applicability of supporting data for the current and forthcoming versions of the FSAR and supplemental ER.

15.06.05-1

10 CFR 100.21 and 10 CFR 52.79 require that the COL application meet the radiological dose consequences of postulated accidents set forth in 10 CFR 50.34(a)(1) and 10 CFR 52.79(a)(1)(vi), respectively. General Design Criteria (GDC) 19 in 10 CFR Part 50 Appendix A, requires that in regard to control room access and occupancy, the COL applicant that does not reference a standard design approval or certification, is to provide adequate radiation protection so that radiation exposures shall not exceed 0.05 Sv (5 rem TEDE).

The bounding values for isotopic activity release rates to the environment for the design basis accidents (DBAs) are documented as a permit condition in Appendix B, "Controlling Values of Parameters and Design-Basis Accident Source Term Plant Parameters," in Early Site Permit No. ESP-003. Demonstrate how these values are met by the isotopic activity releases per time period specified in the radiological consequence analyses for each DBA analyzed in the ESBWR DCD, Revision 5, Section 15.4 and Chapter 15 of North Anna Site Safety Analysis Report (SSAR) of the North Anna Early Site Permit Application.

If the isotopic release rates specified in the ESBWR DCD, Chapter 15, Revision 5 and Chapter 15 of North Anna SSAR of the North Anna Early Site Permit Application are not bounded by those specified in Appendix B to the North Anna Early Site Permit, provide the site-specific radiological consequence doses for exclusion area boundary, low population zone, and control room for each DBA to demonstrate that North Anna site still meets the dose evaluation factors set forth in 10 CFR 50.34(a)(1)(ii)(D), 10 CFR 52.79(a)(1)(vi), and GDC 19 even though the isotopic activity releases per time period specified in the radiological consequence analyses for each DBA analyzed in the ESBWR DCD, Revision 5, Section 15.4 and Chapter 15 of North Anna Site Safety Analysis Report of the North Anna Early Site Permit Application are not bounded by those specified in North Anna Early Site Permit Appendix B.