



June 21, 2006

U. S. Nuclear Regulatory Commission  
Attention: Document Control Desk  
Washington, D.C. 20555

Serial No. 06-507  
ESP/JDH  
Docket No. 52-008

**DOMINION NUCLEAR NORTH ANNA, LLC**  
**NORTH ANNA EARLY SITE PERMIT APPLICATION**  
**RESPONSE TO NRC QUESTIONS AND REVISION 7 TO THE NORTH ANNA ESP**  
**APPLICATION**

In a May 24, 2006 letter (Serial No. 06-440), Dominion Nuclear North Anna, LLC (Dominion) submitted its responses to a May 10, 2006 NRC request for additional information, NRC comments in a May 12, 2006 site audit summary report, and follow-up telephone questions from the NRC environmental project manager related to the site audit. Those responses have been incorporated in the enclosed Revision 7 of the North Anna Early Site Permit (ESP) application.

On June 2 and 5, 2006, NRC conducted additional telephone conference calls with Dominion to further discuss the application. As a result, in a June 7, 2006 letter, NRC requested that Dominion provide information in response to five additional questions. Dominion's responses to those five questions are provided in Enclosure 1 and have also been incorporated in Revision 7 of the North Anna ESP application.

A summary of the changes in Revision 7 of the North Anna ESP application is provided as Enclosure 2. A CD containing Revision 7 of the North Anna ESP application is provided as Enclosure 3.

If you have any questions or require additional information, please contact Tony Banks at 804-273-2170 or Joe Hegner at 804-273-2770.

Very truly yours,

Eugene S. Grecheck  
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Enclosures:

1. Response to June 7, 2006 NRC questions.
2. Summary of Changes to North Anna ESP Application Revision 7.
3. One CD-ROM labeled "North Anna Early Site Permit Application, Docket No. 52-008, September 2003; Revision 7, June 2006, NRC ADAMS Edition," containing the following files:

001 North Anna ESP Application R7 (1 of 6).pdf; 13.5MB; publicly available  
002 North Anna ESP Application R7 (2 of 6).pdf; 20,333,587 bytes, publicly available  
003 North Anna ESP Application R7 (3 of 6).pdf; 49,720,156 bytes, publicly available  
004 North Anna ESP Application R7 (4 of 6).pdf; 36,955,037 bytes, publicly available  
005 North Anna ESP Application R7 (5 of 6).pdf; 38,933,988 bytes, publicly available  
006 North Anna ESP Application R7 (6 of 6).pdf; 28,420,032 bytes, publicly available

Commitments made in this letter: None

COMMONWEALTH OF VIRGINIA

COUNTY OF HENRICO

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Eugene S. Grecheck, who is Vice President, Nuclear Support Services, of Dominion Nuclear North Anna, LLC. He has affirmed before me that he is duly authorized to execute and file the foregoing document on behalf of Dominion Nuclear North Anna, LLC, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 21<sup>st</sup> day of June, 2006.

My Commission expires: ~~My Commission Expires July 31, 2007~~

Vera F. Thomas

Notary Public



**Enclosure 1**

**Response to June 7, 2006 NRC Questions**

**June 7, 2006 NRC Letter (General Comment)**

The staff has reviewed revision 06 of the ESP application and it has discovered apparent discrepancies in the application.

It is our understanding the ER Table 3.1-1 indicates various reactor designs that were used to develop the bounding site specific plant parameter envelope (PPE) values contained in ER Table 3.1-9. The values in ER Table 3.1-1 are generic values not site specific values. Therefore, the site specific values in ER Table 3.1-9 differ from the values in ER Table 3.1-1. Likewise, ER Tables 3.1-7 and 3.1-8 provide radionuclide activity values for various designs whereas, ER Tables 5.4-6 and 5.4-7 provide bounding values for radionuclide activity.

Based on the above observations, the staff is requesting that Dominion provide responses to the following questions:

**NRC Question 1 (June 7, 2006)**

Clarify the purpose of the ER Tables 3.1-1, 3.1-9, 5.4-6, and 5.4-7 in ER section 3.1-3 and 3.1-6. Make consistent changes to the corresponding tables in the SSAR.

**Response**

The staff's understanding of the purposes of ER Tables 3.1-1 and 3.1-9 is correct. For clarification, ER Table 3.1-1 has been renamed "Generic Plant Parameters Envelope" and ER Table 3.1-9 has been renamed "Bounding Site-Specific Plant Parameters Envelope." Similarly, SSAR Table 1.3-1 has been renamed "Generic Plant Parameters Envelope" and SSAR Table 1.9-1 has been renamed "Bounding Site-Specific Plant Parameters Envelope." The text in ER Section 3.1 and SSAR Section 1.3 has been revised to further clarify the purpose of the two tables.

The radionuclide activity releases in ER Tables 5.4-6 and 5.4-7 are composite, bounding values based on multiple reactor designs. To eliminate inconsistencies, ER Tables 3.1-7 and 3.1-8 have been deleted and any references to these tables have been changed to ER Tables 5.4-6 and 5.4-7. SSAR Tables 1.3-7 and 1.3-8 have been revised to be identical to ER Tables 5.4-6 and 5.4-7.

**Application Revision**

The application has been revised as indicated.

**NRC Question 2 (June 7, 2006)**

The reference of ER Table 3.1-1 in Table 3.1-9 should be removed due to differences between the site specific and generic PPE values.

Response

The references to ER Table 3.1-1 have been removed from ER Table 3.1-9. Similarly, all references to SSAR Table 1.3-1 have been removed from SSAR Table 1.9-1.

Application Revision

The application has been revised as indicated.



**NRC Question 3 (June 7, 2006)**

The footnote in ER Tables 5.4-6 and 5.4-7 is misleading. Please clarify the footnote to indicate that the radionuclide values in ER Tables 5.4-6 and 5.4-7 are the bounding values for the application.

Response

The footnotes explained the differences between ER Tables 5.4-6 and 5.4-7 and corresponding ER Tables 3.1-7 and 3.1-8. Since the latter tables have been deleted (see Question 1 response), the footnotes have also been deleted. Footnotes were added to explain how ABWR and ESBWR activities were adjusted in arriving at the composite values. The only place in the ER that radionuclide release values are now presented is in Tables 5.4-6 and 5.4-7. Further, SSAR Tables 1.3-7 and 1.3-8 have been revised to be identical to ER Tables 5.4-6 and 5.4-7.

Application Revision

The application has been revised as indicated.

**NRC Question 4 (June 7, 2006)**

The staff has identified the following discrepancies in SSAR tables 1.3-1, 1.3-2, 1.3-7, 1.3-8, 1.9-1 and ER tables 3.1-1, 3.1-2, 3.1-7, 3.1-8, 3.1-9, 5.4-6, and 5.4-7, and the bounding notes of various tables:

- a. SSAR Table 1.3-1 (Item 10) indicates that the source term is based on "Bounding Notes" or "Bound Notes" 1, 3, 4, 5 and 13 out of SSAR Table 1.3-2. SSAR Table 1.3-2 indicates that notes 1, 3, 4 and 5 reflect the designs of the AP1000, ABWR/ESBWR, PBMR, and the ACR-700, while note 13 cites the ABWR, AP1000, ACR-700 as the basis, but it excludes the PBMR design. However, ER Table 3.1-2 redefines note 13 as being comprised of the ABWR, AP1000, ACR-700, and the ESBWR designs.
- b. SSAR Table 1.3-7 indicates that its footnotes refer to the ACR-700, ABWR, and AP1000 designs. However, ER Table 3.1-7 indicates that the basis for the source term is different as it refers to the ACR-700, ESBWR with a 25% margin, ABWR, and the AP1000 designs.
- c. ER Table 3.1-9 indicates that the basis of the liquid effluent source term is ER Table 3.1-1 (Item 10) and ER Table 5.4-6. However, the source term in ER Table 5.4-6 has been maximized and is higher than that given in SSAR Table 1.3-7 and ER Table 3.1-7 supporting the use of the PPE concept.
- d. There are inconsistent values of liquid effluent source term radioactivity levels (by radionuclides and as totals) among SSAR and ER Tables 1.3-7, 3.1-7, and 5.4-6, with some radionuclides being excluded, e.g., Zn-69m, Br-83, Ru-105, Ba-139, and La-142 from SSAR Table 1.3-7. Also, some activity levels cited in SSAR Table 1.3-7 and ER Table 3.1-7 seem to be inconsistent with those given in Tables 1.3-1 and 3.1-1.
- e. ER Table 3.1-1 provides a link to the various reactor designs from which the bounding values in ER Table 3.1-9 are derived. ER Table 3.1-9 contains the site specific bounding values (or PPE values) that the reactor design selected at the COL stage must fit within. Please explain this discrepancy or clarify the titles of ER Table 3.1-1 and ER Table 3.1-9 to remove the confusion.

The above examples are based on using ER Table 5.4-6 for liquid effluents, similar discrepancies were also noted using ER Table 5.4-7 for gaseous effluents. Dominion should review the application for inconsistencies/discrepancies elsewhere in the application and provide the corrected information in revision 07 of the application.

### Response

Changes have been made to SSAR Section 1.3 and ER Section 3.1 to remove inconsistencies. Specific comments are addressed below.

- a. Bounding Notes 12 and 13 in SSAR Table 1.3-2 have been revised to include the ESBWR in the list of designs considered for source terms, consistent with Notes 12 and 13 of ER Table 3.1-2.
- b. ER Tables 3.1-7 and 3.1-8 have been deleted (see Question 1 response) with the references to these tables replaced by references to ER Tables 5.4-6 and 5.4-7. SSAR Tables 1.3-7 and 1.3-8 have been revised to be identical to ER Tables 5.4-6 and 5.4-7, thereby eliminating inconsistencies.
- c. The references to ER Table 3.1-1 have been deleted from ER Table 3.1-9. Now ER Tables 3.1-1 and 3.1-9 refer to ER Table 5.4-6 for the liquid source terms. The section on gaseous source terms has been similarly revised.
- d. See Response b above.
- e. ER Table 3.1-1 has been renamed "Generic Plant Parameters Envelope" and ER Table 3.1-9 has been renamed "Bounding Site-Specific Plant Parameters Envelope." The text in ER Section 3.1 has been revised to further clarify the purposes of the two tables. The SSAR has been similarly revised.

The application has been reviewed for inconsistencies/discrepancies. This resulted in a change in text from a prior revision, eliminating differences in tables, and correcting a typographical and a grammatical error. A summary of the changes is provided in Enclosure 2 which identifies where a response to the June 7, 2006 RAIs has resulted in a change to the application.

### Application Revision

The application has been revised as indicated.

**NRC Question 5 (June 7, 2006)**

Provide a conversion for liquid and gaseous effluents releases (from Ci/yr to  $\mu\text{Ci/ml}$ ) that meets the requirements of 10CFR Part 20, Appendix B, Table 2, Columns 1 and 2 (e.g., refer to ESBWR DCD Revision 1, Tier 2, Table 12.2-17 and 12.2-19b). The derivation of effluent concentrations ( $\mu\text{Ci/ml}$ ) should be based on the source terms (Ci/yr) presented in ER Tables 5.4-6 and 5.4-7 using North Anna specific data. Dominion should include this information in the SSAR.

Response

ER Tables 5.4-6 and 5.4-7 have been revised to show five columns of information: (1) isotope name, (2) activity release (Ci/yr), (3) effluent concentration ( $\mu\text{Ci/ml}$ ), (4) 10 CFR 20 effluent concentration limit (ECL) ( $\mu\text{Ci/ml}$ ), and (5) fraction of ECL. ER Section 5.4.2 has been revised to briefly explain how the effluent concentrations are calculated. SSAR Tables 1.3-7 and 1.3-8 have been revised to be identical to ER Tables 5.4-6 and 5.4-7. SSAR Section 1.3.1 has been revised to briefly explain how the effluent concentrations are calculated.

Application Revision

The application has been revised as indicated.

**Enclosure 2**

Summary of Changes to North Anna ESP Application Revision 7

<b>Summary of Changes to North Anna ESP Application Revision 7</b>	
<b>Affected Section, Table, or Figure</b>	<b>Reason for Change</b>
<b>Part 2 Chapter 1</b>	
▪ Section 1.3.1	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Section 1.3.3	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Section 1.3 References	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Table 1.3-1	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Table 1.3-2	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Table 1.3-7	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Table 1.3-8	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Section 1.9	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Table 1.9-1	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
<b>Part 2 Chapter 2</b>	
▪ Section 2.5.4.2.2	▪ Corrected typographical error
<b>Part 2 Chapter 15</b>	
• Section 15.4	• Dominion letter (Serial No. 06-440), dated May 24, 2006
• Table 15.4-1	• Dominion letter (Serial No. 06-440), dated May 24, 2006
• Table 15.4-5a	• Dominion letter (Serial No. 06-440), dated May 24, 2006
• Table 15.4-5b	• Dominion letter (Serial No. 06-440), dated May 24, 2006
• Table 15.4-5d	• Dominion letter (Serial No. 06-440), dated May 24, 2006
• Table 15.4-12b	• Dominion letter (Serial No. 06-440), dated May 24, 2006

• Table 15.4-19b	• Dominion letter (Serial No. 06-440), dated May 24, 2006
• Table 15.4-19c	• Dominion letter (Serial No. 06-440), dated May 24, 2006
• Table 15.4-23b	• Dominion letter (Serial No. 06-440), dated May 24, 2006
• Table 15.4-28	• Dominion letter (Serial No. 06-440), dated May 24, 2006
• Table 15.4-29	• Dominion letter (Serial No. 06-440), dated May 24, 2006
• Table 15.4-31	• Dominion letter (Serial No. 06-440), dated May 24, 2006
<b>Part 3 Chapter 2</b>	
▪ Section 2.7.5.1	▪ Corrected grammatical error
▪ Table 2.7-20	▪ Removed text leftover from previous revision
<b>Part 3 Chapter 3</b>	
▪ Section 3.1.3	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Section 3.1.6	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Table 3.1-1	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Table 3.1-2	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Table 3.1-7	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Table 3.1-8	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Table 3.1-9	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Section 3.2	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Section 3.3	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Section 3.3.1	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Table 3.3-1	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Table 3.3-2	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006

▪ Section 3.4.1	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Section 3.4.1.1	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Section 3.4.1.2	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Section 3.4.2	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Section 3.5	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Section 3.5.1	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Section 3.5.2	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Section 3.5.3	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
<b>Part 3 Chapter 5</b>	
▪ Section 5.3.1.1	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Section 5.3.2.1	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Section 5.3.3.1	▪ Dominion letter (Serial No. 06-440), dated May 24, 2006
▪ Section 5.3.3.2.1	▪ Dominion letter (Serial No. 06-440), dated May 24, 2006
▪ Section 5.3.3.2.4	▪ Dominion letter (Serial No. 06-440), dated May 24, 2006
▪ Section 5.4.2.1	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Section 5.4.2.2	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Section 5.4 References	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Table 5.4.6	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Table 5.4.7	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Section 5.5.1.1	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Section 5.8.1.2	▪ Dominion letter (Serial No. 06-440), dated May 24, 2006



▪ Section 5.8.1.5	▪ Dominion letter (Serial No. 06-440), dated May 24, 2006
<b>Part 3 Chapter 6</b>	
▪ Section 6.4.1.1	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
<b>Part 3 Chapter 7</b>	
▪ Section 7.1.4	▪ Dominion letter (Serial No. 06-440), dated May 24, 2006
▪ Table 7.1-2	▪ Dominion letter (Serial No. 06-440), dated May 24, 2006
▪ Table 7.1-6a	▪ Dominion letter (Serial No. 06-440), dated May 24, 2006
▪ Table 7.1-6b	▪ Dominion letter (Serial No. 06-440), dated May 24, 2006
▪ Table 7.1-6d	▪ Dominion letter (Serial No. 06-440), dated May 24, 2006
▪ Table 7.1-13b	▪ Dominion letter (Serial No. 06-440), dated May 24, 2006
▪ Table 7.1-20b	▪ Dominion letter (Serial No. 06-440), dated May 24, 2006
▪ Table 7.1-20c	▪ Dominion letter (Serial No. 06-440), dated May 24, 2006
▪ Table 7.1-24b	▪ Dominion letter (Serial No. 06-440), dated May 24, 2006
▪ Table 7.1-29	▪ Dominion letter (Serial No. 06-440), dated May 24, 2006
▪ Table 7.1-30	▪ Dominion letter (Serial No. 06-440), dated May 24, 2006
▪ Table 7.1-32	▪ Dominion letter (Serial No. 06-440), dated May 24, 2006
<b>Part 3 Chapter 9</b>	
▪ Section 9.3.3.4.1	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Table 9.4-1	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006
▪ Table 9.4-5	▪ Dominion letter (Serial No. 06-507), dated June 21, 2006

**Enclosure 3**

One CD-ROM labeled "North Anna Early Site Permit Application, Docket No. 52-008, September 2003; Revision 7, June 2006, NRC ADAMS Edition"