

**From:** <Tony\_Banks@Dom.com>  
**To:** "Nitin Patel" <NXP1@nrc.gov>, "Jack Cushing" <JXC9@nrc.gov>  
**Date:** Mon, Jul 31, 2006 4:02 PM  
**Subject:** Fw: 06-631 Response to NRC Questions and Revision 8 to the North Anna ESP Application (Letter and Enclosures 1 & 2 Only)

Two ADAMS CDs are being overnited today. Review copy CDs will follow.

Tony

----- Forwarded by Tony Banks/NUC/VANCPower on 07/31/2006 03:37 PM -----

Margaret Bennett/SVCS/VANC POWER	To Tony Banks/NUC/VANCPower@VANCPower
07/31/2006 03:32 PM	cc
	Subject 06-631 Response to NRC Questions and Revision 8 to the North Anna ESP Application (Letter and Enclosures 1 & 2 Only)

(See attached file: 06-631\_Ltr&Enc1&2\_Only.pdf)

-----  
**CONFIDENTIALITY NOTICE:** This electronic message contains information which may be legally confidential and/or privileged and does not in any case represent a firm ENERGY COMMODITY bid or offer relating thereto which binds the sender without an additional express written confirmation to that effect. The information is intended solely for the individual or entity named above and access by anyone else is unauthorized. If you are not the intended recipient, any disclosure, copying, distribution, or use of the contents of this information is prohibited and may be unlawful. If you have received this electronic transmission in error, please reply immediately to the sender that you have received the message in error, and delete it. Thank you.

**CC:** <maryann.parkhurst@pnl.gov>

**Mail Envelope Properties** (44CE61B8.8F8 : 8 : 30968)

**Subject:** Fw: 06-631 Response to NRC Questions and Revision 8 to the North Anna ESP Application (Letter and Enclosures 1 & 2 Only)  
**Creation Date** Mon, Jul 31, 2006 4:01 PM  
**From:** <Tony\_Banks@Dom.com>  
**Created By:** Tony\_Banks@Dom.com

**Recipients**

nrc.gov

TWGWPO03.HQGWDO01  
NXP1 (Nitin Patel)

nrc.gov

OWGWPO03.HQGWDO01  
JXC9 (Jack Cushing)

pnl.gov

maryann.parkhurst CC

**Post Office**TWGWPO03.HQGWDO01  
OWGWPO03.HQGWDO01**Route**nrc.gov  
nrc.gov  
pnl.gov**Files**

Files	Size
MESSAGE	2368
06-631_Ltr&Enc1&2_Only.pdf	469470
Mime.822	1

**Size****Date & Time**

Monday, July 31, 2006 4:01 PM

**Options**

<b>Expiration Date:</b>	None
<b>Priority:</b>	Standard
<b>ReplyRequested:</b>	No
<b>Return Notification:</b>	None

<b>Concealed Subject:</b>	No
<b>Security:</b>	Standard

**Junk Mail Handling Evaluation Results**

Message is eligible for Junk Mail handling  
This message was not classified as Junk Mail

**Junk Mail settings when this message was delivered**

Junk Mail handling disabled by User

Junk Mail handling disabled by Administrator

Junk List is not enabled

Junk Mail using personal address books is not enabled

Block List is not enabled



July 31, 2006

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

Serial No. 06-631  
ESP/JDH  
Docket No. 52-008

**DOMINION NUCLEAR NORTH ANNA, LLC**  
**NORTH ANNA EARLY SITE PERMIT APPLICATION**  
**RESPONSE TO NRC QUESTIONS AND REVISION 8 TO THE NORTH ANNA ESP**  
**APPLICATION**

On June 21, 2006, Dominion submitted Revision 7 of the North Anna ESP application. On July 6, 2006, Dominion and NRC held a conference call and on July 12, 2006, NRC conducted a site audit. Both activities were to discuss clarifications needed for the NRC staff to complete its review. Those activities were documented in a summary published by the NRC on July 18, 2006. The summary listed thirteen questions and potential clarifications. Dominion's responses to those thirteen items are provided in Enclosure 1 and have been incorporated in Revision 8 of the North Anna ESP application.

A summary of the changes in Revision 8 of the North Anna ESP application is provided as Enclosure 2. A CD containing Revision 8 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,

A handwritten signature in black ink, appearing to read "Eugene S. Grecheck".

Eugene S. Grecheck  
Vice President-Nuclear Support Services

Enclosures:

1. Response to July 18, 2006 NRC questions.
2. Summary of Changes to North Anna ESP Application Revision 8.
3. One CD-ROM labeled "North Anna Early Site Permit Application, Docket No. 52-008, September 2003; Revision 8, July 2006, NRC ADAMS Edition," containing the following files:

001 North Anna ESP Application R8 (1 of 6).pdf; 13.6MB; publicly available  
002 North Anna ESP Application R8 (2 of 6).pdf; 20,164,188 bytes, publicly available  
003 North Anna ESP Application R8 (3 of 6).pdf; 49,749,548 bytes, publicly available  
004 North Anna ESP Application R8 (4 of 6).pdf; 21,529,641 bytes, publicly available  
005 North Anna ESP Application R8 (5 of 6).pdf; 38,063,782 bytes, publicly available  
006 North Anna ESP Application R8 (6 of 6).pdf; 28,455,383 bytes, publicly available

Commitments made in this letter: None

cc: U. S. Nuclear Regulatory Commission, Region II  
Sam Nunn Atlanta Federal Center  
61 Forsyth Street, SW  
Suite 23T85  
Atlanta, GA 30303

Mr. Jack Cushing  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Mr. J. T. Reece  
NRC Senior Resident Inspector  
North Anna Power Station

Mr. Nitin Patel  
U. S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Mr. Richard Kingston  
GE Nuclear Energy  
Castle Hayne Rd, PO Box 780  
Wilmington, NC 28401

Administrative Judge  
Alex S. Karlin, Chair  
Atomic Safety and Licensing Board  
Mail Stop T-3 F23  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Mr. Joseph Hassell  
Virginia Department of Environmental Quality  
629 East Main Street  
Richmond, VA 23219

Mr. John Kauffman  
Virginia Department of Game & Inland Fisheries  
900 Natural Resources Drive, Suite 100  
Charlottesville, VA 22903

Administrative Judge  
Dr. Thomas S. Elleman  
Atomic Safety and Licensing Board  
Mail Stop T-3 F23  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Administrative Judge  
Dr. Richard F. Cole  
Atomic Safety and Licensing Board  
Mail Stop T-3 F23  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dianne Curran, Esq.  
Harmon, Curran, Spielberg & Eisenberg, LLP  
1726 M Street, N.W., Suite 600  
Washington, D.C. 20036

Richard A. Parrish, Esq.  
Southern Environmental Law Center  
201 West Main Street  
Charlottesville, VA 22902

Ms. Ellie L. Irons, Program Manager  
Office of Environmental Impact Review  
Virginia Department of Environmental Quality  
P.O. Box 10009  
Richmond, VA 23240

Mr. Adrian Heymer  
Nuclear Energy Institute  
1776 I Street, N.W., Suite 400  
Washington, D.C. 20006

Jonathan M. Rund, Esq.  
Law Clerk  
Atomic Safety and Licensing Board Panel  
Mail Stop: T-3F23  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Morgan W. Butler, Esq.  
Southern Environmental Law Center  
201 West Main Street  
Charlottesville, VA 22902

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 31<sup>ST</sup> day of July, 2006.

My Commission expires: August 31, 2008

Margaret B. Bennett  
Notary Public

(SEAL)



**Enclosure 1**

**Response to July 18, 2006 NRC Questions**

**July 18, 2006 NRC Letter (General Comment)**

Dominion submitted Revision 07 of the ESP application on June 21, 2006, to address questions identified by the staff in a June 07, 2006, teleconference (teleconference summary dated June 07, 2006, ADAMS Accession Number ML061580174). In reviewing Revision 07, the staff concluded that Dominion addressed the questions, however, questions 4.a and 5 were only partially addressed. The staff requests responses to the following questions and comments to fully resolve the apparent discrepancies discussed in questions 4.a and 5.

**NRC Question 1 (July 18, 2006)**

Site Safety Analysis Report (SSAR) Table 1.3-1 and ER Table 3.1-1, PPE Section 9.3.1

Bounding note 12 should be referenced instead of note 6 to provide more clarity.

Response

The tables have been revised to refer to Bounding Note 12.

Application Revision

SSAR Table 1.3-1 and ER Table 3.1-1 have been revised as indicated.

**NRC Question 2 (July 18, 2006)**

SSAR Table 1.3-2 and ER Table 3.1-2, Notes 12 and 13

Indicate that liquid and gaseous source terms reflect ABWR with an adjusted power of 4300 MWt and ESBWR scaled up by a margin of 25 percent.

Response

Notes 12 and 13 refer to SSAR Tables 1.3-7 and 1.3-8 and ER Tables 5.4-6 and 5.4-7. These four referenced tables already indicate that ABWR activities were scaled up to 4300 MWt and ESBWR activities were by 25 percent. For further clarity, Notes 12 and 13 have been revised to repeat this information.

Application Revision

SSAR Table 1.3-2 and ER Table 3.1-2 have been revised as indicated.

**NRC Question 3 (July 18, 2006)**

**SSAR Table 1.3-7 and ER Table 5.4-6**

Table footnotes should indicate that the composite liquid effluent activities are based on ABWR, AP1000, ACR-700, and ESBWR, and the stated adjustments to the ABWR and ESBWR.

**Response**

The footnotes have been revised to clarify the bases for the composite values.

**Application Revision**

SSAR Table 1.3-7 and ER Table 5.4-6 have been revised as indicated.

**NRC Question 4 (July 18, 2006)**

SSAR Table 1.3-8 and ER Table 5.4-7

Table footnotes should indicate that the composite gaseous effluent activities are based on ABWR, AP1000, ACR-700, and ESBWR, and the stated adjustments to the ABWR and ESBWR.

Response

The footnotes have been revised to clarify the bases for the composite values.

Application Revision

SSAR Table 1.3-8 and ER Table 5.4-7 have been revised as indicated.

**NRC Question 5 (July 18, 2006)**

**ER Table 3.1-9**

In the "Doses Consequences" section, provide reference to ER Table 5.4-7 in discussing normal dose compliance for 10 CFR 20 for gaseous limits.

**Response**

ER Table 5.4-7 was not cited for dose consequences because this table shows effluent concentrations, not doses. However, since concentrations are related to doses, the reference list has been revised to include Table 5.4-7.

**Application Revision**

ER Table 3.1-9 has been revised as indicated.

**NRC Question 6 (July 18, 2006)**

ER Table 3.1-9

In the "Liquid Radwaste System" section, provide reference to ER Table 5.4-6 in discussing normal dose compliance for 10 CFR 20 for liquid effluents.

Response

ER Table 5.4-6 was not cited for dose consequences because this table shows effluent concentrations, not doses. However, since concentrations are related to doses, the reference list has been revised to include Table 5.4-6.

Application Revision

ER Table 3.1-9 has been revised as indicated.

**NRC Question 7 (July 18, 2006)**

ER Table 3.1-9

In the "Source Term" section, change tritium release from "3530 Ci/yr (7060 Ci/yr)" to "3500 Ci/yr (7000 Ci/yr)" consistent with the value in ER Table 5.4-7.

Response

The table entry has been corrected.

Application Revision

ER Table 3.1-9 has been revised as indicated.



**NRC Question 8 (July 18, 2006)**

ER Section 5.4.1.1

It is stated that the dilution factor (DF) is 10:

- a. Explain why a DF of 1000 was used in Table 5.4-6 rather than 10.
- b. Is it still conservative?
- c. What is the basis for a DF of 1000?
- d. Which blowdown rates of Table 3.1-9 are used?
- e. For clarity, add a note that the existing units provide a total of approximately 430,000 gpm in the discharge canal ((based on UFSAR Table 11.2-20).

Response

- a. In prior revisions of the application, the dilution factor of 10 in ER Table 5.4-1 reflected LADTAP II input. LADTAP II was run with an effluent discharge rate of 10,000 gpm and a dilution factor of 10. In LADTAP II, a discharge rate of 10,000 gpm with a dilution factor of 10 yields the same results as a discharge rate of 100 gpm with a dilution factor of 1000 since the composite activity releases per year defined in ER Table 5.4-6 are contained within both discharge models. Either way, the effective dilution flow is 100,000 gpm. When this effective dilution flow is divided by the plant effluent discharge rate of 100 gpm, the dilution factor is 1000. The effluent concentrations in ER Table 5.4-6 are also based on a dilution flow of 100,000 gpm, consistent with the LADTAP II dose calculations. Table 5.4-1 has been revised to remove the entry for dilution factor and to show an effluent discharge rate of 100 gpm and a dilution flow rate of 100,000 gpm. Table 3.1-9 is revised to be consistent with section 5.4.1.1 and Table 5.4-1.
- b. Section 5.4.1.1 has been revised to remove the statement that "the dilution factor is a conservative low value of 10." It now mentions a DF of 1000. The DF of 1000 is still conservative because of the composite activity releases utilized.
- c. The DF of 1000 is based on a liquid effluent discharge rate of 100 gpm and a dilution flow of 100,000 gpm.
- d. The blowdown rates of Table 3.1-9 are for heat sink applications only. They are not used for effluent dilution calculations. However, in determining the allowed effluent discharge from the new units at such time as the units are constructed and placed in operation, credit for the blowdown flow to the WHTF may be taken to achieve required dilution.

**NRC Question 8 (July 18, 2006) cont.**

- e. Section 5.4.1.1 has been revised to document that the existing units' evaluation for effluent dilution is based on a flow of 430,000 gpm in the discharge canal.

**Application Revision**

ER Tables 3.1-9, 5.4-1 and Section 5.4.1.1 have been revised as indicated.

**NRC Question 9 (July 18, 2006)**

ER Section 5.4.2.1

It is stated that the sum of the fractions of effluent concentration limits (ECL) is within unity. Using a DF of 10 as provided in ER Section 5.4.1.1 and Table 5.4.1, the results of the staff's independent evaluation do not confirm these results. This needs to be reconciled with the actual DF used in Table 5.4-6 and Table 3.1-9 data.

Response

As indicated in the response to Question 8a, the effluent concentrations in Table 5.4-6 are based on a dilution flow of 100,000 gpm, which corresponds to a DF of 1000 when compared to the effluent discharge rate of 100 gpm. ER Section 5.4.1.1 and Tables 3.1-9 and 5.4-1 have been revised to reflect a DF of 1000. The concentrations and doses have not been revised as a result of this definition change.

Application Revision

ER Section 5.4.1.1 and Tables 3.1-9 and 5.4-1 have been revised as indicated.

**NRC Question 10 (July 18, 2006)**

ER Table 5.4-1

It is stated that the DF for discharge is 10.

- a. The staff's independent evaluation indicates that a DF of 1000 was applied to obtain the results in Table 5.4-6.
- b. Explain why a DF of 10 was used for all calculations except for 10 CFR Part 20, App. B, Table 2 compliance.
- c. Provide the basis for using a DF of 1000, using the blowdown rates of Table 3.1-9.
- d. It would be more clear to replace the effluent discharge rate of "100 gpm with 10,000 gpm dilution" with "100 gpm" and replacing "Dilution factor for discharge 10" with "Site specific dilution flow rate 100,000 gpm."

Response

- a. As indicated in the response to Question 8a, the effluent concentrations in Table 5.4-6 are based on a dilution flow of 100,000 gpm, which corresponds to a DF of 1000. Table 5.4-1 has been revised to remove the dilution factor of 10 and to show an effluent discharge rate of 100 gpm and a dilution flow rate of 100,000 gpm.
- b. As indicated in the response to Question 8a, the dose calculations and the 10 CFR Part 20 effluent calculations are both based on a DF of 1000. Table 5.4-1 has been revised to reflect this.
- c. The blowdown rates of Table 3.1-9 are for heat sink applications only. They are not used for effluent dilution calculations.
- d. Table 5.4-1 has been revised as suggested.

Application Revision

ER Table 5.4-1 has been revised as indicated.

**NRC Question 11 (July 18, 2006)**

**SSAR Section 3.5.1.6**

This section references Section 2.2.3.2.1. The appropriate reference should be Section 2.2.3.2.

**Response**

The typographical error has been corrected.

**Application Revision**

SSAR Section 3.5.1.6 has been revised as indicated.

**NRC Question 12 (July 18, 2006)**

**SSAR Sections 1.3.1, 1.9, ER Sections 3.1.6 and 5.4.2**

Expand the discussion on the basis consideration of source terms, in light of the various reactor designs and the increase in the power level.  
Expand the description of the considerations applied in developing the bounding site specific PPE values from generic PPE values.

**Response**

SSAR Section 1.3.1 has been revised to provide a discussion on how the composite source terms are obtained from multiple reactor designs. SSAR Section 1.9 now refers to the added discussion in Section 1.3.1. In the revised ER, Section 3.1.6 refers to SSAR Section 1.3.1 and Section 5.4.2 refers to Section 3.1.6.

**Application Revision**

SSAR Sections 1.3.1 and 1.9 and ER Sections 3.1.6, 5.4.2.1, and 5.4.2.2 have been revised as indicated.

**NRC Question 13 (July 18, 2006)**

ER Section 5.4.4.3

Typographical error on the third line, "(40 CFR 90)" should read as "(40 CFR 190)."

Response

The typographical error has been corrected.

Application Revision

ER Section 5.4.4.3 has been revised as indicated.

**Enclosure 2**

**Summary of Changes to North Anna ESP Application Revision 8**



Summary of Changes to North Anna ESP Application Revision 8	
Affected Section, Table, or Figure	Reason for Change
<b>Part 2 Chapter 1</b>	
▪ Section 1.3.1	▪ Dominion letter (Serial No. 06-631), dated July 31, 2006
▪ Table 1.3-1	▪ Dominion letter (Serial No. 06-631), dated July 31, 2006
▪ Table 1.3-2	▪ Dominion letter (Serial No. 06-631), dated July 31, 2006
▪ Table 1.3-7	▪ Dominion letter (Serial No. 06-631), dated July 31, 2006
▪ Table 1.3-8	▪ Dominion letter (Serial No. 06-631), dated July 31, 2006
▪ Section 1.9	▪ Dominion letter (Serial No. 06-631), dated July 31, 2006
<b>Part 2 Chapter 3</b>	
▪ Section 3.5.1.6	▪ Dominion letter (Serial No. 06-631), dated July 31, 2006
<b>Part 3 Chapter 3</b>	
▪ Section 3.1.6	▪ Dominion letter (Serial No. 06-631), dated July 31, 2006
▪ Table 3.1-1	▪ Dominion letter (Serial No. 06-631), dated July 31, 2006
▪ Table 3.1-2	▪ Dominion letter (Serial No. 06-631), dated July 31, 2006
▪ Table 3.1-9	▪ Dominion letter (Serial No. 06-631), dated July 31, 2006
<b>Part 3 Chapter 5</b>	
▪ Section 5.4.1.1	▪ Dominion letter (Serial No. 06-631), dated July 31, 2006
▪ Section 5.4.2.1	▪ Dominion letter (Serial No. 06-631), dated July 31, 2006

NRC Letter No. 06-631  
Docket No. 52-008  
Response to NRC Questions/ESP Application Rev. 8  
Enclosure 2

▪ Section 5.4.2.2	▪ Dominion letter (Serial No. 06-631), dated July 31, 2006
▪ Section 5.4.4.3	▪ Dominion letter (Serial No. 06-631), dated July 31, 2006
▪ Table 5.4-1	▪ Dominion letter (Serial No. 06-631), dated July 31, 2006
▪ Table 5.4-6	▪ Dominion letter (Serial No. 06-631), dated July 31, 2006
▪ Table 5.4-7	▪ Dominion letter (Serial No. 06-631), dated July 31, 2006

**Enclosure 3**

**One CD-ROM labeled "North Anna Early Site Permit Application, Docket No. 52-008, September 2003; Revision 8, July 2006, NRC ADAMS Edition"**