October 20, 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. 030 (SRP SECTIONS 02.03.01, 06.02.04, 09.05.04, 11.03, 12.02, 12.03-12.04) 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

October 20, 2008

Mr. Eugene S. Grecheck
Vice President - Nuclear Development
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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.

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Thomas A. Kevern, Senior Project Manager
ESBWR/ABWR Projects Branch 1
Division of New Reactor Licensing
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Docket No. 52-017
Enclosure: Request for Additional Information
Distribution:

TKevern, NRO	AJohnson, NRO	RGoel, NRO	DGalvin, NRO
NRO_DNRL_NGE2	MLesser, Rgn2	BHarvey, NRO	MSnodderly, NRO
SGreem, NRO	SBrock, OGC	CCox, NRO	TTai, NRO
J-CDehmel, NRO	TFrye, NRO	CHinson, NRO	GMakar, NRO
AHowe, NRO			

E-RAI Tracking No: 1011, 1231, 1264, 1294, 1354, 1355, and 1482
ADAMS Accession No.: ML082940356

OFFICE	TR: RSAC	BC: RSAC	PM:DNRL:NGE1	OGC (NLO)	PM:DNRL:NGE1
NAME	BHarvey*	CCox*	AJohnson*	SBrock*	TKevern*
DATE	09/25/08	09/25/08	09/25/08	09/29/08	10/17/08
OFFICE	TR: SBCV	BC: SBCV	PM:DNRL:NGE1	OGC (NLO)	PM:DNRL:NGE1
NAME	RGoel*	MSnodderly*	TTai*	SBrock*	TKevern*
DATE	09/18/08	09/18/08	09/22/08	09/26/08	10/17/08
OFFICE	TR: CHPB	BC: CHPB	PM:DNRL:NGE1	OGC (NLO)	PM:DNRL:NGE1
NAME	J-CDehmel*	TFrye*	AJohnson*	AHodgon*	TKevern*
DATE	08/13/08	08/13/08	09/02/08	09/02/08	10/20/08
OFFICE	TR: CHPB	BC: CHPB	PM:DNRL:NGE1	OGC (NLO)	PM:DNRL:NGE1
NAME	CHinson*	TFrye*	AJohnson*	SBrock*	TKevern*
DATE	09/26/08	10/01/08	10/01/08	10/07/08	10/20/08
OFFICE	TR: CIB2	BC: CIB2	PM:DNRL:NGE1	OGC (NLO)	PM:DNRL:NGE1
NAME	GMakar*	AHowe*	DGalvin*	SBrock*	TKevern*
DATE	10/14/08	10/14/08	10/16/08	10/17/08	10/20/08

*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: 02.03.01 - Regional Climatology; 06.02.04 - Containment Isolation System; 09.05.04 - Emergency Diesel Engine Fuel Oil Storage and Transfer System; 11.03 - Gaseous Waste Management System; 12.02 - Radiation Sources; 12.03-12.04 - Radiation Protection Design Features
Application: FSAR Sections: 2.0; 2.3.1; 6.2; 9.5.4; 11.3.1; and, Chapter 12

QUESTIONS

02.03.01-4

The response to RAI 02.03.01-2 states that a 100-year coincident wet bulb temperature of 76 F was derived by plotting Richmond dry-bulb temperatures with their maximum observed coincident wet-bulb temperatures and extrapolating the resulting curve to 109 °F (the 100-year return period maximum dry bulb temperature). The resulting 76°F concurrent wet bulb value does not appear to be conservative. Justify why the concurrent wet bulb value should not be a higher value, such as 78°F.

The CD-ROM accompanying Chapter 28 to the 2005 ASHRAE Handbook – Fundamentals provides a joint frequency matrix of Richmond, VA dry bulb (DB) temperatures and mean coincident wet bulb (MCWB) temperatures for the period 1972-2001. A plot of the upper end for this joint frequency matrix is attached. A linear trend line through the last five data points in this joint frequency matrix extrapolated out to a DB temperature of 109°F projects a MCWB temperature of 77.8°F. A DB/MCWB combination of 109°F/76°F is also inconsistent with 0.4% and 0% exceedance DB/MCWB combinations of 95°F/77°F and 104.9°F/79°F presented in North Anna ESPA SSAR Table 2.3-18.

06.02.04-2

In FSAR Section 6.2.4.2, the proposed COL Item 6.2-1-H states that the pipe lengths will be determined as part of completion of the piping design ITAAC identified in DCD Tier 1, Table 3.1-1 (Table 2.15.1-2, item 2.a.iii). Item 2.a.iii referes to an ASME Code Design Data Report. How does this ASME Design Data Report verify that the Containment Isolation Valves in FSAR Tables 6.2-15 through 6.2-45 have been located as close as practical to containment.

09.05.04-6

NAPS COL 9.5.4-2-A states that buried carbon steel piping for the diesel fuel oil transfer system will have a coating and impressed-current cathodic protection system for external corrosion control. However, It does not identify the corrosion control system for the internal surface of the piping or provide the industry standards that will be applied to these corrosion control methods. The ESBWR DCD and North Anna FSAR state that SRP Section 9.5.4 and RG 1.137 do not apply. However, RTNSS Criterion B and C apply to the system and availability of standby and ancillary diesel generators is required according to the Availability Controls Manual (ACLCO 3.8.1 and 3.8.2). In addition, the ESBWR DCD (p. 9.5-46) states underground piping portions of the standby DG system will be designed and constructed according to “the latest industry standards for buried pipe including

provisions for corrosion protection," but it does not identify the standards to be used. Please modify the FSAR to clarify the internal and external corrosion protection methods for underground portions of the diesel generator fuel oil storage and transfer systems, and to identify the industry standards that will be applied to the corrosion protection systems.

11.03-2

RAI 11.03-0 and Dominion's response address the conduct of a plant and site specific cost-benefit (CB) analyses for the Gaseous Waste Management System (GWMS). While the staff's evaluation generally concurs with the CB ratios of the analyses of the three system augments considered, the review identified four items as requiring further information and technical and regulatory clarifications. Specifically, the applicant is requested to address and resolve the following four items in the proposed revision of FSAR Section 11.3.1:

a. Given that the CB analyses are based on Regulatory Guide (RG) 1.110, provide the rationale for not presenting the information (cost parameters) following the format of Appendix C to RG 1.110. See regulatory position C.5 of RG 1.110.

b. The presentation of information and then discussions in excluding GWMS system design for PWR plants as being not applicable for BWRs is extraneous and should be removed from the proposed FSAR update; see FSAR p.11-7 and 11-8. The introduction of the CB analyses should state that all system augments considered in the analyses include only those that are compatible with BWR plant design features.

c. The discussion and rationale for excluding the 600 ft^3 gas decay tank, given a residence time of 19 minutes, is not consistent with the source term 'as there are noble gases with radioactive half-lives of less than 19 minutes. These include Kr-89, Xe-135m, Xe-137, and Xe-138, which make up a significant fraction of the noble gas source term for the turbine building. Accordingly, it is recommended that this augment be reconsidered on the basis of a CB analysis, rather than excluding it solely on the basis of radionuclide half-lives.

d. The discussion supporting the exclusion of system augments on the basis capacity or flow rates is incomplete as it is not clear if attempts were made to match or approximate system capacities as closely as is possible with that of DCD system design features. For example, the consideration of a 15,000 CFM HEPA filtration system augment for the CONAVS system with a capacity of about 42,300 CFM is not logical. The closest option in RG 1.110 for such augment is 30,000 CFM; see Table A-1. As a result, the discussion should provide qualitative and/or quantitative qualifiers addressing the impact of such differences in capacities and expected impacts (as direction and magnitude) of the resulting cost-benefit-ratio. This observation applies to all other CB cases dismissed in a similar manner in this response.

12.02-11

Dominion responded to RAI 12.02-1 by letter NA3-08-043 (dated 4/28/08). The staff requests further clarification in the presentation of FSAR information and results.

a. The citation of Appendix 12B in FSAR Table 12.2-15R (second column header) should be qualified as to its origin. As presented, it implies that the appendix is

located in the North Anna FSAR but in fact Appendix 12B is located in Chapter 12 of the ESBWR DCD. A new footnote should be added stating that Appendix 12B is located in Chapter 12 of the ESBWR DCD.

b. Provide the technical basis and year of data in FSAR Table 12.2-17R for the incremental gaseous effluent concentrations for North Anna Units 1 and 2 in making up the total effluent concentration from all three units, listed as "Units 1, 2 & 3 Concentration" in the tabulation. This information is not included in this subsection, nor included as a footnote to the table.

c. A new footnote should be added to Table 12.2-18bR for the purpose of referring to Table 12.2-203 for the complementary limiting dose result for the child (bone) since this dose result is derived from the same set of assumptions and analysis.

d. The following observations were noted in reviewing FSAR Table 12.2-204: (i) a new footnote should be added referencing to ER Tables 5.4-1, 5.4-3, and 2.5-8 of the North Anna ESP (Rev. 9, Sept. 2006) as the source of data in deriving collective doses; (ii) a new entry or a footnote should be added to Table 12.2-204 for the purpose of listing collective dose results for the thyroid in support of the discussion presented on page 2 of 29 on the COLA markup; and (iii) a new footnote should be added to this table specifying the location (FSAR or ER tables) of the atmospheric dispersion and deposition parameters used in deriving collective doses from routine stack effluent releases within 50-miles of the plant.

12.02-12

Dominion responded to RAI 12.02-2 by letter NA3-08-063R (dated 08/04/08). The staff generally concurs with the response to RAI 12.02-2 and proposed update of FSAR Section 12.2.2.4.4 and Table 12.2-203, with a request for the following clarifications:

a. Although the discussion on external radiation due to N-16 in the RAI response preamble is deemed acceptable, the issue is not closed in the proposed revision of Table 12.2-203. The proposed revision of Table 12.2-203 still does not identify turbine building skyshine as a contributing source of radiation for Unit 3 since the direct dose from NAPS 1 & 2 does not have this characteristic. It may be construed that the addition of 1 mrem/yr (under revised footnote 2) would include dose contributions from turbine building skyshine when it does not. It is suggested that a new footnote be added only for the annual total body dose entry of 1.9 mrem in Table 12.2-203 for Unit 3 stating that the total annual dose includes the negligible contribution from turbine building skyshine ($<2.0 \times 10^{-4}$ mrem/yr) at the location of highest expected exposures at the EAB.

b. On p.12-8 of the proposed revision of FSAR Section 12.2.2.4.4, the text discusses the dose contribution from the ISFSI facility and states that the dose at the closest point on the EAB is expected to be about 1.7 mrem/yr, based on 40 fully-loaded cask modules. This new information should be supported with a reference(s) and note whether it is based on data for NAPS 1 & 2 or generic PWR and BWR fuel data and cask modules.

Accordingly, the applicant is requested to update its proposed revision to the corresponding FSAR Section 12.2.2.4.4 in addressing the above observations.

12.03-12.04-9

The staff has identified the following items for which correction is requested.

a. Section 12.1.4 of the North Anna FSAR, the title of STD COL 1-3-A should read "Operational Considerations" instead of "Occupational Radiation Exposures".

b. The 3 COL Information Items listed in Section 12.5.4 of the North Anna FSAR do not agree with the numbering system listed in Section 12.5.4 of the ESBWR DCD. The correct numbering of these COL Information Items should be as follows:

   * COL 12.5-1-A Equipment, Instrumentation, and Facilities
   * COL 12.5-2-A Compliance with 10 CFR 50.34(f)(2)(xxvii) and NUREG-0737 Item III.D.3.3
   * COL 12.5-3-A Radiation Protection Program

c. In Table 1.9-203 of the North Anna FSAR, Sections C.III.1 (12.2.1) and C.III.1 12.3.4) of RG 1.206 are addressed in the North Anna FSAR by COL information items. Therefore, the column labeled "Conformance Evaluation" for these entries in Table 1.9-203 should be modified to include the specific section of the North Anna FSAR where these issues are addressed.

d. There is an inconsistency between the "evaluation" sections of Tables 1.9-201 and Tables 1.9-202 of the North Anna FSAR with respect to compliance with the guidance contained in RG 1.16. Table 1.9-201 (section on SRP Section 12.5, acceptance criteria II.1) states that the North Anna FSAR conforms with Section 12.5 of the SRP with the exception that Sections C.1.b(2) and C.1.b(3) of RG 1.16 are no longer applicable to licensees. However, Table 1.9-202 states that the North Anna FSAR conforms to the guidance of RG 1.16, with no mention of the two sections of this RG which are no longer applicable. Correct the evaluation section of the reference to RG 1.16 in Table 9-202 to be consistent with the reference in Table 1.9-201.

e. In Table 1.9-202 of the North Anna FSAR, there are two errors in the RGs referenced in the "evaluation" column. For the entries for RGs 8.26 and 8.32, correct the references to "RG 8.20" to read "RG 8.26" and "RG 8.32", respectively.