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

Serial No. NA3-08-105R
Docket No. 52-017
COL/MWH

DOMINION VIRGINIA POWER
NORTH ANNA UNIT 3 COMBINED LICENSE APPLICATION
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION LETTER 027 (FSAR
CHAPTER 12)

On August 21, 2008, the NRC requested additional information to support the review of certain portions of the North Anna Unit 3 Combined License Application (COLA). The response to the following RAIs is provided in Enclosures 1 through 7:

- RAI Question 12.01-1 Update Commitment to Final Version of NEI 07-03
- RAI Question 12.01-2 ALARA Procedures for Use of Inclined Fuel Transfer System
- RAI Question 12.01-3 Update Commitment to Final Version of NEI 07-08
- RAI Question 12.03-12.04-5 Effect of TLD Changes on Construction Worker Dose Estimates
- RAI Question 12.03-12.04-6 Effect of ISFSI Changes on Construction Worker Dose Estimates
- RAI Question 12.03-12.04-7 Effect of Peak Number of Worker Changes on Construction Worker Dose Estimates
- RAI Question 12.03-12.04-8 Describe Operational Programs for Meeting 10 CFR 20.1406(a) Requirements

Please contact Regina Borsh at (804) 273-2247 (regina.borsh@dom.com) if you have questions.

Very truly yours,

Eugene S. Grecheck

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NPD

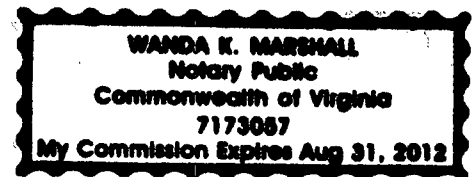
COMMONWEALTH OF VIRGINIA

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 Development of Virginia Electric and Power Company (Dominion Virginia Power). He has affirmed before me that he is duly authorized to execute and file the foregoing document on behalf of the Company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 3rd day of October, 2008
My registration number is 7173057 and my
Commission expires: August 31, 2012

Wanda K. Marshall
Notary Public



Enclosures:

1. Response to RAI Letter Number 027, RAI Question 12.01-1
2. Response to RAI Letter Number 027, RAI Question 12.01-2
3. Response to RAI Letter Number 027, RAI Question 12.01-3
4. Response to RAI Letter Number 027, RAI Question 12.03-12.04-5
5. Response to RAI Letter Number 027, RAI Question 12.03-12.04-6
6. Response to RAI Letter Number 027, RAI Question 12.03-12.04-7
7. Response to RAI Letter Number 027, RAI Question 12.03-12.04-8

Commitments made by this letter:

1. The commitment to incorporate NEI 07-03 and NEI 07-08 will be updated to reference the approved revision of these documents following NRC approval.

cc: U. S. Nuclear Regulatory Commission, Region II
T. A. Kevern, NRC
J. T. Reece, NRC
J. J. Debiec, ODEC
G. A. Zinke, NuStart/Entergy
T. L. Williamson, Entergy
R. Kingston, GEH
K. Ainger, Exelon
P. Smith, DTE

ENCLOSURE 1

Response to NRC RAI Letter 027

RAI Question 12.01-1

NRC RAI 12.01-1

FSAR Section 12.1.4, STD COL 12.1-1-A, STD COL 12.1-2-A, STD COL 12.1-3-A, and STD COL 12.1-4-A includes a commitment to the use of the Radiation Protection Program as an operational program document, based on NEI Template 07-03, which is currently under NRC staff review. This NEI template presents the functional elements of the Radiation Protection Program, which, if met, would demonstrate compliance with Regulatory Guides (RG) 1.8, 8.8, and 8.10, and 10 CFR 20.1101. Upon final NRC acceptance of NEI Template 07-03, verify that the applicant will update the commitment of FSAR Section 12.1.4, STD COL 12.1-1-A, STD COL 12.1-2-A, STD COL 12.1-3-A, and STD COL 12.1-4-A to reference the final version of this template (or otherwise update the FSAR to address any differences from this final template version), consistent with RG 1.206 and Section 12.1 of the Standard Review Plan (NUREG-0800). Accordingly, the applicant should update all internal citations to the final NEI Template 07-03 in applicable FSAR subsections and references.

Dominion Response

FSAR Section 12.1.4 identifies that FSAR Appendix 12BB, Radiation Protection, addresses occupational radiation exposure and compliance with RG 1.8, 8.8, and 8.10. FSAR Appendix 12BB references the revision of NEI 07-03, "Generic FSAR Template Guidance for Radiation Protection Program Description," that was submitted to the NRC for review at the time of COLA submittal. FSAR Appendix 12BB also includes the statement that recognizes that NEI 07-03 is under NRC staff review.

If NEI 07-03 is approved by the NRC, FSAR Table 1.6-201 and FSAR Appendix 12BB will be updated to reference the approved revision of NEI 07-03. If the NEI template is not approved by the NRC, the FSAR will be revised to provide an alternate description of the Radiation Protection Program.

Proposed COLA Revision

None.

ENCLOSURE 2

Response to NRC RAI Letter 027

RAI Question 12.01-2

NRC RAI 12.01-2

FSAR Section 12.1.4, STD COL 12.1-3-A includes a commitment to the NEI 07-03 template. The NEI 07-03 template describes methods for establishing and implementing procedures to maintain exposures ALARA for dose related activities found at each plant. The template states that COL applicants may modify the template to indicate alternate or additional procedures for maintaining exposures ALARA. Since the Inclined Fuel Transfer Tube (IFTT) system is unique to the ESBWR, procedures to maintain exposures associated with operation of the IFTT system ALARA are not included in the NEI template 07-03. However, the operation of the IFTT system could result in high dose rates in rooms and spaces adjacent to the IFTT during fuel transfer. Describe procedures that will be used to maintain exposures ALARA during operation of the IFTT system. Additionally, provide a description of any alternate or additional procedures not generally described in the NEI 07-03 template that will be used to maintain exposures ALARA.

Dominion Response

FSAR Section 12.1.4 identifies that FSAR Appendix 12BB addresses occupational radiation exposure for dose-related activities. FSAR Appendix 12BB references NEI 07-03, "Generic FSAR Template Guidance for Radiation Protection Program Description." It is acknowledged that operation of the Inclined Fuel Transfer System (IFTS) for spent fuel movement could result in high radiation levels in certain plant areas adjacent to the transfer tube. As described in DCD, Rev. 5, Section 12.3.1.4.4, the inclined fuel transfer tube passes through a shielded tube and through rooms 18P2 and 1702, with no connection to any other room or area that could be accessible during fuel handling operations. In addition, access from any area adjacent to the transfer tube is controlled through a system of physical controls, interlocks and an annunciator. An audible alarm and flashing red lights are provided inside and outside any IFTS maintenance area indicating IFTS operation. Radiation monitors with alarms are provided both inside and outside any IFTS maintenance area to warn of high radiation levels. Note also that the IFTS design is not considered to be unique to the ESBWR since previous generation BWR-designs (e.g., Mark III containment/BWR-6) utilize an inclined fuel transfer tube design, and typical PWRs utilize a horizontal fuel transfer tube design, that also could result in high radiation levels adjacent to the tube transits during fuel handling operations.

FSAR Section 9.1.4.13 provides a description of fuel handling procedure development requirements. Fuel handling procedures address all aspects of fuel handling operations including the proper conditions for spent fuel movement and storage and provide instructions for use of refueling equipment. Fuel handling procedures are developed six months before fuel receipt to allow sufficient time for plant staff familiarization, to allow NRC staff adequate time to review the procedures, and to develop operator licensing examinations. FSAR Section 13.5.2.1.7 states that fuel handling operations, including fuel movement and storage, are performed in accordance with written procedures and that fuel handling procedures address, among other things, proper conditions for spent fuel movement and storage, and provide instructions for the use of refueling equipment.

There are no alternate or additional procedures, not generally described in NEI 07-03, that will be used to maintain occupational exposures ALARA currently contemplated or required to be included in the FSAR. The response to RAI 12.05-2 (Dominion letter S/N NA3-08-095R dated September 19, 2008) commits to revise FSAR Appendix 12BB to supplement the incorporation of NEI 07-03 by removing the second paragraph in Section 12.5.4.2 of the template.

Proposed COLA Revision

None.

ENCLOSURE 3

Response to NRC RAI Letter 027

RAI Question 12.01-3

NRC RAI 12.01-3

FSAR STD SUP 12.1-1 includes a commitment to the use of guidance for ensuring that occupational radiation exposures are as low as is reasonably achievable (ALARA), based on draft NEI Template 07-08, which is currently under NRC staff review. This NEI template discusses operational policies and operational considerations to ensure that occupational radiation exposures are ALARA. Upon final staff acceptance of NEI Template 07-08, please update the commitment of FSAR Section 12.1 and Appendices 12 AA and 12 BB to reference the final version of this template (or otherwise update the FSAR to address any differences from this final template version). Accordingly, the applicant should update all internal citations to the final NEI Template 07-08 in applicable FSAR subsections and references

Dominion Response

FSAR Section 12.1, FSAR STD SUP 12.1-1 identifies that FSAR Appendices 12AA, ALARA Program, and 12BB, Radiation Protection, incorporate by reference NEI 07-08, "Generic FSAR Template Guidance for Ensuring that Occupational Radiation Exposures Are As Low As Is Reasonably Achievable (ALARA)," and NEI 07-03, "Generic FSAR Template Guidance for Radiation Protection Program Description," respectively. FSAR Appendix 12AA also includes the statement that recognizes that NEI 07-08 is under NRC staff review.

If NEI 07-08 is approved by the NRC, FSAR Table 1.6-201 and FSAR Appendix 12AA will be updated to reference the approved revision of NEI 07-08. If the NEI template is not approved by the NRC, the FSAR will be revised to provide an alternate description of the ALARA Program.

Note that NEI 07-08 is referenced in FSAR Appendix 12AA, but not referenced in FSAR Appendix 12BB as stated in the RAI.

Proposed COLA Revision

None.

ENCLOSURE 4

Response to NRC RAI Letter 027

RAI Question Number 12.03-12.04-5

NRC RAI 12.03-12.04-5

FSAR supplemental information (NAPS SUP 12.4-1 (Section 12.4.6.1 Annual Doses to Construction Workers)), states that changes have been made to the locations and readings for TLDs located closest to the Unit 3 site since issuance of the North Anna ESP. Since the applicant used readings from the TLDs located closest to the Unit 3 site to calculate the direct radiation dose component of the annual dose to construction workers, please specify what effect, if any, these changes to the TLD readings and locations have on the estimated direct radiation dose component contribution to construction workers working on Unit 3.

Dominion Response

The evaluation of direct radiation dose to construction workers in ESP-ER Section 4.5 included seven years of dose readings from a TLD located on the North Anna Units 1 and 2 west protected area fence. An evaluation of four additional years of TLD data from this location, and readings from an additional TLD located near the northwest corner of the Unit 3 site boundary, was performed. The evaluation concluded that the estimated direct radiation dose component contribution to construction workers working on Unit 3 that was submitted in the ESP application remains bounding.

Proposed COLA Revision

None.

ENCLOSURE 5

Response to NRC RAI Letter 027
RAI Question Number 12.03-12.04-6

NRC RAI 12.03-12.04-6

FSAR supplemental information (NAPS SUP 12.4-1 (Section 12.4.6.1 Annual Doses to Construction Workers)), states that the spent fuel cask types planned for the onsite Independent Spent Fuel Storage Installation (ISFSI) have changed since the issuance of the North Anna ESP. The ESP-ER stated that the expected dose from the ISFSI to the construction workers is $9.8 \times 10^{-2} \text{ mSv/yr}$ (9.8 mrem/yr). Please discuss the following:

- a. Identify changes made to the types of spent fuel casks that will be stored in the onsite ISFSI.*
- b. Describe how storage of spent fuel in these new cask types will affect the expected annual dose from the ISFSI to the construction workers.*
- c. Describe what effect the storage of spent fuel in these new cask types will have on the expected total annual dose to construction workers.*

Dominion Response

- a. The ESP-ER evaluated the onsite ISFSI for the storage of TN-32 casks on three storage pads. The current plan for the onsite ISFSI includes one storage pad for TN-32 casks and two storage pads for horizontal NUHOMS®-HD modules. A NUHOMS®-HD module contains the same amount of spent fuel as a TN-32 cask.
- b. The dose rate from a NUHOMS®-HD module is projected to be comparable to that from a TN-32 cask. Therefore, the use of a different cask type will not affect the expected annual dose from the ISFSI to Unit 3 construction workers.
- c. Since the annual dose contribution from the ISFSI is not changed with the different spent fuel storage modules, there is no effect on the expected total annual dose to Unit 3 construction workers.

Proposed COLA Revision

None.

ENCLOSURE 6

Response to NRC RAI Letter 027
RAI Question Number 12.03-12.04-7

NRC RAI 12.03-12.04-7

FSAR supplemental information (NAPS SUP 12.4-1 (Section 12.4.6.1 Annual Doses to Construction Workers)), states the estimated peak number of construction workers has changed from 5000 (stated in the ESP-ER) to between 2500 and 3500 workers. The applicant concludes that the estimated maximum annual dose of 120 person-rem (specified in the COLA ER) remains a conservative estimate of the maximum annual collective dose to the construction work force. Please discuss the following:

- a. Specify any changes to the estimate for the annual dose per construction worker and, if so, verify that the estimated individual worker doses still comply with the dose limits in 10 CFR 20.1301.*
- b. Provide the revised estimate for the maximum annual dose to the construction workforce based on the revised peak estimate of 2500-3500 construction workers.*

Dominion Response

- a. There have been no changes to the estimate for the annual dose per construction worker.
- b. Based on the ratio of between 2500 and 3500, versus 5000, construction workers, the estimated maximum annual dose to the construction workforce would be 60-84 person-rem, versus 120 person-rem.

Proposed COLA Revision

None.

ENCLOSURE 7

Response to NRC RAI Letter 027

RAI Question 12.03-12.04-8

NRC RAI 12.03-12.04-8

Using the guidance provided in RG 4.21, "Minimization of Contamination and Radioactive Waste Generation: Life Cycle Planning" (June 2008), provide a description of all of the operational programs and how the facility's procedures for operations will meet the requirements of 10 CFR 20.1406(a) (i.e., minimize to the extent practicable, contamination of the facility and the environment, facilitate eventual decommissioning, and minimize, to the extent practicable, the generation of radioactive waste). [Note that the NRC issued RAIs to the ESBWR DC applicant requesting general description of how each of the main design objectives contained in RG 4.21 will be met in the generic design and, in addition, to address the objectives which are more operational or procedural in nature by identifying COL items in the appropriate DCD sections for COLA's referencing the ESBWR design.]

Please revise appropriate sections of the FSAR to include a detailed description of how the COL items contained in the revised DCD will be resolved along with a listing addressing each of these COL items in FSAR Section 12.3. For example, an acceptable description of a groundwater monitoring program should include implementation considerations and a description of the key components of the program such as types and periodicity of routine samples to be taken, threshold activities to be detected, actions to be taken upon detection of leakage into the groundwater, and a description of quality assurance practices to be used to ensure a reasonable assurance of prompt identification of leakage into the groundwater.

Dominion Response

NEI 08-08, "Generic FSAR Template Guidance for Life Cycle Minimization of Contamination," is currently being developed to address the guidance provided in RG 4.21 in a standardized format for use in the COL FSAR. Following submittal of NEI 08-08 for NRC review, the COLA will be revised to incorporate the report by reference in order to provide a description of the operational programs that will be in place to meet the requirements of 10 CFR 20.1406. In addition, if the ESBWR DCD, Rev. 5, is revised to include additional COL Items for FSAR Section 12.3, the COLA will be updated to address the specific COL Items.

Proposed COLA Revision

None.