

## NorthAnnaRAIsPEm Resource

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**From:** Patel, Chandu  
**Sent:** Tuesday, September 09, 2014 2:40 PM  
**To:** 'na3raidommailbox@dom.com' (na3raidommailbox@dom.com)  
**Cc:** Weisman, Robert; NorthAnnaRAIsPE Resource; Klos, John; Quinlan, Kevin  
**Subject:** RAI Letter 133, RAI 7660 - FSAR Section 2.3.5, North Anna 3 COLA (52-017)  
**Attachments:** RAI Letter 133 RAI\_7660.docx

Hi,

By letter dated November 26, 2007, Dominion Virginia Power (Dominion) submitted a Combined License Application for North Anna, Unit 3, pursuant to Title 10 of the *Code of Regulations*, Part 52. The U.S. Nuclear Regulatory Commission (NRC) staff is performing a detailed review of this COLA.

The NRC staff has identified that additional information is needed to continue portions of the review and a Request for Additional Information (RAI), is enclosed. To support the review schedule, Dominion is requested to respond within 30 days of the date of this request. If the RAI response involves changes to the application documentation, Dominion is requested to include the associated revised documentation with the response.

Sincerely,

**Chandu Patel, Senior Project Manager**  
**U.S. NRC, Office of New Reactors**  
**NRC/NRO/DNRL/LB3,**  
**Washington, DC 20555-0001**  
**301.415.3025**  
**MS T6D38**

**Hearing Identifier:** NorthAnna3\_eRAI  
**Email Number:** 50

**Mail Envelope Properties** (Chandu.Patel@nrc.gov20140909144019)

**Subject:** RAI Letter 133, RAI 7660 - FSAR Section 2.3.5, North Anna 3 COLA (52-017)  
**Sent Date:** 9/9/2014 2:40:24 PM  
**Received Date:** 9/9/2014 2:40:19 PM  
**From:** Patel, Chandu

**Created By:** Chandu.Patel@nrc.gov

**Recipients:**

"Weisman, Robert" <Robert.Weisman@nrc.gov>

Tracking Status: None

"NorthAnnaRAIsPE Resource" <NorthAnnaRAIsPE.Resource@nrc.gov>

Tracking Status: None

"Klos, John" <John.Klos@nrc.gov>

Tracking Status: None

"Quinlan, Kevin" <Kevin.Quinlan@nrc.gov>

Tracking Status: None

"na3raidommailbox@dom.com" (na3raidommailbox@dom.com) <na3raidommailbox@dom.com>

Tracking Status: None

**Post Office:**

Files	Size	Date & Time
MESSAGE	929	9/9/2014 2:40:19 PM
RAI Letter 133 RAI_7660.docx	31482	

**Options**

**Priority:** Standard

**Return Notification:** No

**Reply Requested:** No

**Sensitivity:** Normal

**Expiration Date:**

**Recipients Received:**

## **Request for Additional Information 133**

Issue Date: 09/09/2014

Application Title: North Anna, Unit 3 - Docket Number 52-017

Operating Company: Dominion

Docket No. 52-017

Review Section: 02.03.05 - Long-Term Atmospheric Dispersion Estimates for Routine Releases

Application Section: Long-Term Atmospheric Dispersion

### **QUESTIONS**

02.03.05-5

The annual average atmospheric dispersion and deposition factors are used in the calculation of offsite concentrations and dose consequences of postulated routine airborne radioactive releases to demonstrate compliance with 10 CFR Part 20 and Appendix I to 10 CFR Part 50. Regulatory Guide 1.111, Revision 1, "Methods for Estimating Atmospheric Transport and Dispersion of Gaseous Effluents in Routine Releases from Light-Water-Cooled Reactors," presents criteria for characterizing atmospheric dispersion and deposition conditions for evaluating the consequences of routine releases. Regulatory Guide 1.111 provides source configuration criteria for determining when effluent release points can be considered elevated releases, ground-level releases, or part-time elevated/part-time ground-level (i.e., mixed-mode) releases.

The ESBWR DCD, Revision 10, provides a set of long-term  $\chi/Q$  and  $D/Q$  values for each of the three stacks (Radwaste Building stack, Reactor Building/Fuel Building stack and Turbine Building Stack). For the ESBWR analysis, both ground-level and mixed-mode releases were considered. As stated in Subsection 2.3.5.3 of the Final Safety Evaluation Report for the ESBWR standard design (ML110030027), a ground-level release was considered for releases from the Radwaste Building, while mixed-mode releases were considered for releases from the Reactor Building/Fuel Building stack and the Turbine Building stack based on the criteria set forth in RG 1.111.

Similarly, Subsection 2.3.5.1 of the Fermi 3 FSAR (ML14055A083), which also references the ESBWR standard design, states that a ground-level release was considered for releases from the Radwaste Building and mixed-mode releases were considered for releases from the Reactor Building/Fuel Building stack and the Turbine Building stack.

North Anna 3 COL FSAR Section 2.3.5, "Long-Term (Routine) Diffusion Estimates," describes the input data and assumptions that are used in the XOQDOQ model for routine releases. The North Anna 3 FSAR states that the vent stacks on the Reactor Building/Fuel Building, Turbine Building, and Radwaste Building are all modeled as mixed-mode releases. The North Anna COL FSAR also states that the Radwaste Building stack is close enough to the Turbine Building that the stack will experience building downwash effects from the Turbine Building. According to Tier 2, Table 2B-1 of the ESBWR DCD, the Radwaste Building stack height is 18.15 meters above grade whereas the Turbine Building height is 52.0 meters above grade.

RG 1.111 states that for effluents released from points less than the height of adjacent solid structures, ground-level release should be assumed. Ground-level releases under these circumstances account for the initial mixing of the effluent plume within the building wake.

Considering the source configuration criteria set forth in RG 1.111 and the modeling methodology used in the ESBWR DCD, please either update the FSAR to include a justification for modeling the Radwaste building vent stack as a mixed-mode release or update the FSAR to implement the ground-level source configuration guidance provided in RG 1.111 for Radwaste building vent stack releases.