

## NorthAnnaRAIsPEm Resource

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**From:** Buckberg, Perry  
**Sent:** Friday, October 17, 2014 9:46 AM  
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**Cc:** Patel, Chandu; NorthAnnaRAIsPEm Resource; Hinson, Charles; McCoppin, Michael; Williams, Stephen  
**Subject:** Draft North Anna 3 RAIs - Radiaton Protection  
**Attachments:** Draft RAI\_7682 10-17-14.docx; Draft RAI\_7690 10-17-14.docx

Hello,

Please see attached draft RAIs 7682 and 7690 related to radiation protection for the North Anna 3 COLA. Please let me know if you need clarification on these draft RAIs by CoB Tuesday.

Thanks,

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U.S. Nuclear Regulatory Commission

Office of New Reactors

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## **DRAFT Request for Additional Information**

Issue Date: 10/17/2014

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

Operating Company: Dominion

Docket No. 52-017

Review Section: 12.03-12.04 - Radiation Protection Design Features

Application Section: 12.4.7.1

### **QUESTIONS:**

#### **26264**

RG 1.206, "Combined License Applications for Nuclear Power Plants," Section C.I.12.3.5, "Dose Assessment," states that, for multiunit plants, the applicant should provide estimated annual doses to construction workers in a new unit construction area, as a result of radiation from onsite radiation sources from the existing operating plant(s).

NA3 COL FSAR Figure 2.1-201 depicts a steam generator storage building located directly north of the ISFSI and closer to the NA3 construction area than the ISFSI.

Provide a description of the measured direct dose rates from this facility and compare these dose rates with the dose rates from the ISFSI. State why the direct dose contribution from this facility is not considered as a direct radiation source to the Unit 3 construction workers.

#### **26265**

RG 1.206, "Combined License Applications for Nuclear Power Plants," Section C.I.12.3.5, "Dose Assessment," states that, for multiunit plants, the applicant should provide estimated annual doses to construction workers in a new unit construction area, as a result of radiation from onsite radiation sources from the existing operating plant(s). RG 1.206 also states that the applicant should include the bases, models, assumptions, and input data for the doses associated with such construction areas.

NA3 COL FSAR Section 12.4.7.1.3.1 makes reference to the Thermo-luminescent dosimeter (TLD) located at the west protected area fence of Units 1 and 2 which is used for the measurement of the direct dose contribution to the construction worker work force from operating Units 1 and 2. This section also references the TLD located along the ISFSI perimeter fence, which is used for the measurement of the direct dose contribution to the construction worker work force from the ISFSI.

a) Provide a site layout drawing showing the locations of all TLDs located along the protected area fence for Units 1 and 2 as well as the TLD(s) located in the vicinity of the ISFSI.

b) Provide a table showing the quarterly dose measurements at each of these TLD locations for the year spans shown in NA3 COL FSAR Section 12.4.7.1.3.1 (2001 to 2011 for the dose from Units 1 and 2 and 2010 to 2012 for the dose from the ISFSI). Specify the TLD location and dose data used to obtain the dose values used in FSAR

Section 12.4.7.1.3.1 and justify why these values were used. Include any more recent dose measurement data not included in your analysis, if available.

#### **26266**

RG 1.206, "Combined License Applications for Nuclear Power Plants," Section C.I.12.3.5, "Dose Assessment," states that for multiunit plants, the applicant should provide estimated annual doses to construction workers in a new unit construction area, as a result of radiation from onsite radiation sources from the existing operating plant(s). RG 1.206 also states that the applicant should include the bases, models, assumptions, and input data for the doses associated with such construction areas.

Although NA3 COL FSAR Section 12.4.7.1 provides an analysis of the estimated annual doses to Unit 3 construction workers, this data is not summarized in any tables at the end of NA3 COL FSAR Section 12.4, as is done in the Fermi 3 COL FSAR. Amend NA3 COL FSAR Section 12.4 to add tables containing the information listed below:

- Maximum Annual Dose to a Construction Worker by Source (mrem)
- Collective Annual Construction Worker Dose by Source (person-rem)
- Comparison of Construction Worker Dose to Public Dose Limits Specified in 10 CFR 20.1301

#### **26267**

RG 1.206, "Combined License Applications for Nuclear Power Plants," Section C.I.12.3.5, "Dose Assessment," states that, for multiunit plants, the applicant should provide estimated annual doses to construction workers in a new unit construction area, as a result of radiation from onsite radiation sources from the existing operating plant(s). RG 1.206 also states that the applicant should include the bases, models, assumptions, and input data for the doses associated with such construction areas.

NA3 COL FSAR Section 12.4.7.1, "Direct Radiation Dose Rates," states that the dose rate at the construction area boundary near the independent spent fuel storage installation (ISFSI) may be estimated by dividing the ISFSI fence dose rate by a distance reduction factor. This distance reduction factor was determined by using a Monte Carlo calculation to assess the dose rate from the ISFSI as a function of distance from the ISFSI. A distance reduction factor of 5.8 was determined by comparing the calculated dose rate of 1.39 mrem/hr at 203 ft from the ISFSI with the calculated dose rate of 0.24 mrem/hr at 500 ft (the distance from the ISFSI to the construction area boundary nearest the ISFSI). By dividing the TLD measured dose rate at the ISFSI fence of 0.176 mrem/hr by this distance reduction factor, the estimated dose rate at the nearest construction area boundary was determined. The same method was used to calculate the estimated dose from the ISFSI at the center of the construction area.

- 1) Verify the accuracy of determining these dose rates at various distances from the ISFSI using these distance reduction factors with dose rates determined using the one over R squared rule.
- 2) Using Monte Carlo calculations, as described in this FSAR section, provide distance reduction factors that can be used to determine estimated doses at other areas in the NA3 construction area, such as at the TLD location at the west protected area fence of

Units 1 and 2 (the TLD used for the measurement of the direct dose contribution to the construction worker work force from operating Units 1 and 2).

## **DRAFT Request for Additional Information**

Issue Date: 10/17/2014

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

Operating Company: Dominion

Docket No. 52-017

Review Section: 11.02 - Liquid Waste Management System

Application Section: 11.2

### **QUESTION:**

For quantification and tracking of radioactive effluents for 10 CFR 20, 10 CFR 50, Appendix I, and 40 CFR 190, include descriptions of radiation measurement instrumentation and related sampling equipment, including redundancy and independence (where applicable); instrumentation range, calibration, and sensitivity; methods for determining alarm/trip setpoints for activating alarms and terminating effluent releases or isolating processes; bases for in-plant effluent dilution; and diversity of components used for normal operations, AOOs, and postulated accidents.

For the liquid waste management system effluent release path in FSAR section 11.2 please provide information for:

1. the process control valves, and any release bypass valves around the radiation monitor or control valves.
2. the radiation monitor interlock functions, operator actions and verifications that will be described by plant procedures.
3. any administrative actions controlling effluent releases.
4. which radiation monitor name, in section 11.5, is involved in providing effluent release control functions.

Please address these items and provide a mark-up for the proposed FSAR changes.