

NorthAnnaRAIsPEm Resource

From: Patel, Chandu
Sent: Tuesday, May 03, 2011 4:17 PM
To: 'na3raidommailbox@dom.com'
Cc: Weisman, Robert; NorthAnnaRAIsPEm Resource; Clement, Richard; Otto, Ngola
Subject: RAI Letter 67, Chapter 11 RAIs for North Anna 3 COLA
Attachments: RAI Letter 67 Chapter 11.doc

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
Lead Project Manager for NA3 COLA

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RAI Letter No. 67
5/3/2011
North Anna, Unit 3
Dominion
Docket No. 52-017
SRP Sections: 11.02 through 11.05
Application Sections: 11.2 through 11.5

QUESTIONS for Health Physics Branch (CHPB)

Request for Additional Information No. 5447

11.02-3

NRC Staff review of FSAR (Rev. 3) Section 11.2.1.5 found insufficient information on the site-specific cost-benefit analysis (CBA) for the LWMS to satisfy NAPS COL 11.2(5) and meet compliance with 10 CFR 50, Appendix I, Section II.D. FSAR Section 11.2.1.5 states the addition of processing equipment of reasonable treatment technology is not favorable or cost beneficial given the population dose of 6.2 person-rem/yr (Total Body), 4.2 person-rem/yr (Thyroid), and the equipment and operating costs in RG 1.110. Specifically, identify the LWMS augment(s) listed in Table A-1 to RG 1.110 and all costs described in Appendix A to RG 1.110 considered in the site-specific CBA. Please provide sufficient information for the staff to evaluate the bases and assumptions of these costs used to determine the site-specific CBA in order to verify compliance with NRC regulations and conformance to NRC guidance. Please provide a mark-up on the proposed FSAR change.

11.02-4

NRC Staff review of FSAR (Rev. 3) Section 11.2.3.1, Tables 11.2-7R, 11.2-9R, 11.2-10R, 11.2-11R, 11.2-12R, and 11.2-13R found information that requires updating and/or needs to be addressed on the calculation of annual liquid effluent releases (expected and maximum) to satisfy NAPS COL 11.2(4) and for the staff verify compliance with NRC regulations and 40 CFR Part 190. Please address the following and provide a mark-up on the proposed FSAR changes.

1. In the applicable FSAR sections, make reference to the MHI PWR-GALE code and the MHI TR MUAP-10019[Proprietary]P (R0), MHI TR MUAP-10019[Non-Proprietary]NP (R0) (ML102850683) which describes the methodology, basis, and assumptions for the calculation of expected and maximum annual liquid effluent releases during normal operation including AOOs for plants referencing the US-APWR design.
2. Tables 11.2-12R and 11.2-13R present discharge concentrations, effluent concentration limits, and fractions of concentration limits for liquid effluent releases from existing Units 1 and 2 and proposed Unit 3. Note 2 to these tables state the discharge concentrations for Units 1 and 2 are from NAPS UFSAR Table 11.2-14 (Reference 11.2-201). Provide a copy of Reference 11.2-201 for the staff to confirm the respective fractions of liquid effluent concentration limits and the sum-of-ratios for operation of three units at the site.
3. Provide a copy of the input/output code files and/or calculation packages which show demonstration of compliance for the staff's review.

11.02-5

NRC Staff review of FSAR (Rev. 3) Section 11.2.3.1, Tables 11.2-14R, 11.2-15R, and 11.2-201 found information on the calculation of liquid effluent doses to satisfy NAPS COL 11.2(4) was not fully described for the staff to verify compliance with NRC regulations and 40 CFR Part 190. Please address the following items and provide a mark-up on the proposed FSAR changes.

1. Provide the basis for the input parameter values used in the LADTAP II code calculation of individual doses from liquid effluent releases.
2. Update FSAR Section 11.2 to address the impact of the plant capacity factor of 80% applied in calculations of doses from liquid effluents when typical operating plant capacity factors exceed 90% (see response to RAI 523-4246, Question 11.02-30, ML100770379).
3. Provide a copy of the input/output LADTAP II code files used to calculate the annual liquid effluent doses and/or calculation packages which show demonstration of compliance for the staff's review.

11.02-6

NRC Staff review of FSAR (Rev. 3) found information that requires updating and/or needs to be addressed in FSAR Sections 11.2.3.2 and 2.4.13, Table 11.2-16R, and NAPS COL 11.2(3) for conformance to SRP Sections 11.2.3 and 2.4.13, and BTP 11-6. Please address the following items and provide a mark-up on the proposed FSAR changes.

1. Update FSAR Sections 11.2.3.2 and 2.4.13 with an assessment based on the methodology and information proposed in US-APWR DCD (Rev. 3) Tier 2, Section 11.2.3.2 and COL 11.2(3) which uses the RATAF code to calculate source terms for the failed liquid tank (ML1025700671) as described in MHI TR MUAP-10019[Proprietary]P (R0), MHI TR MUAP-10019[Non-Proprietary]NP (R0) (ML102850683).
2. Make reference to MHI TR MUAP-10019[Proprietary]P (R0), MHI TR MUAP-10019[Non-Proprietary]NP (R0) (ML102850683) which describes the methodology, basis, and assumptions for failed liquid tank analysis for plants referencing the US-APWR design.
3. In FSAR Sections 11.2.3.2 and 2.4.13, fully describe the approach and results to select the failed liquid tank and provide the basis and assumptions on all site-specific parameter values in the respective updated FSAR sections for assessing the radioactive effluent release to surface or groundwater from a liquid tank failure using site-specific groundwater transport and soil properties to meet compliance with 10 CFR Part 20, Appendix B, Table 2, Column 2, under the unity rule, at the nearest potable water and surface water supplies in an unrestricted area.
4. Update FSAR Section 11.2.3.2 to address the impact of the plant capacity factor of 80% applied in the calculation of doses from a liquid containing tank failure when typical operating plant capacity factors exceed 90% (see response to RAI 523-4246, Question 11.02-30, ML100770379).

11.02-7

Staff review of the FSAR (Rev. 3) and ER (Rev. 3) found that an evaluation on doses from an exposure pathway involving the release of radioactivity into the environment from loss of cooling tower makeup water was not addressed for compliance with NRC regulations and 40 CFR Part 190. Tables 2.3-1 and 10.4-2 to the ER show that Lake Anna contains tritium (7,460 mg/l) and has small concentrations of radioactive elements. Section 3.3.2.2 of the ER states this makeup water is not treated. FSAR Section 11.2.3.1 describes liquid effluents from existing Units 1 and 2 and proposed Unit 3 are eventually discharged into Lake Anna. FSAR Section 9.2.5.2.1 describes that the normal makeup water to the ultimate heat sink (UHS) is from Lake Anna via the cooling tower makeup water and blowdown system. FSAR Section 10.4.5 also describes makeup water to the cooling towers is provided from Lake Anna. RIS 2008-03 states licensees are responsible for evaluating any new exposure pathways and the resultant radiological hazards associated with the return of radioactive material to the operating facility and its subsequent discharge to the environment. RIS 2008-03 also states licensees must evaluate any new exposure pathways to members of the public that contribute 10 percent or more of the total effluent dose and include these dose assessments in their demonstration of compliance with 10 CFR Part 50, Appendix I. Further, RIS 2008-03 states radioactive material, previously not accounted for as an effluent, that is entrained with returned/re-used water must be considered a new effluent disposal per 10 CFR 20.2001. Please address the following items and provide a mark-up on the proposed FSAR changes.

1. Provide the offsite and onsite doses in FSAR Sections 11.2 and 12.4, respectively, from the release of radioactivity into the environment from loss of makeup water due to evaporation, blowdown, and drift during cooling tower operation. Include the methodology, basis, and assumptions used to develop the source term and calculated doses.
2. Demonstrate that this radioactivity is previously disposed of in accordance with 10 CFR 20.2001(a)(3), that this radioactivity is naturally occurring background radiation, or justify that this radioactivity is previously accounted for as an effluent in accordance with RIS 2008-03.

Request for Additional Information No. 5448

11.03-3

NRC Staff review of FSAR (Rev. 3) Section 11.3.1.5 found that the applicant did not provide sufficient information on the site-specific cost-benefit analysis (CBA) for the GWMS to satisfy NAPS COL 11.3(8) and meet compliance with 10 CFR 50, Appendix I, Section II.D. FSAR Section 11.3.1.5 states the addition of processing equipment of reasonable treatment technology is not favorable or cost beneficial given the population dose of 3.8 person-rem/yr (Total Body), 4.1 person-rem/yr (Thyroid), and the equipment and operating costs in RG 1.110. Specifically, identify the GWMS augment(s) listed in Table A-1 to RG 1.110 and all costs described in Appendix A to RG 1.110 considered in the site-specific CBA. Please provide additional information for the staff to evaluate the bases and assumptions of these costs used to determine the site-specific CBA in order to verify compliance with NRC regulations and conformance to NRC guidance.

11.03-4

NRC Staff review of FSAR (Rev. 3) Section 11.3.3.1, Tables 11.2-9R, 11.3-6R, and 11.3-7R found information that requires updating and/or needs to be addressed on the calculation of annual gaseous effluent releases (expected and maximum) to satisfy NAPS COL 11.3(6) and for the staff to verify compliance with NRC regulations and 40 CFR Part 190. Please address the following and provide a mark-up on the proposed FSAR changes.

1. In the applicable FSAR sections, make reference to the MHI PWR-GALE code and the MHI TR MUAP-10019[Proprietary]P(R0), MHI TR MUAP-10019[Non-Proprietary]NP(R0) (ML102850683) which describes the methodology, basis, and assumptions for the calculation of expected and maximum annual gaseous effluent releases during normal operation including AOOs for plants referencing the US-APWR design.
2. Tables 11.3-6R and 11.3-7R present discharge concentrations, effluent concentration limits, and fractions of concentration limits for gaseous effluent releases from existing Units 1 and 2 and proposed Unit 3. Provide the reference for the staff to confirm the respective fractions of gaseous concentration limits and the sum-of-ratios for operation of three units at the site.

11.03-5

NRC Staff review of FSAR (Rev. 3) Section 11.3.3.1, Tables 11.3-8R, 11.3-9R, 11.3-201, 11.3-202, and 11.3-203 found information on the calculation of gaseous effluent doses to satisfy NAPS COL 11.3(6) was not fully described for the staff to verify compliance with NRC regulations and 40 CFR Part 190. Please address the following items and provide a mark-up on the proposed FSAR changes.

1. Provide the basis for the input parameter values used in the GASPARD II code calculation of individual doses from gaseous effluent releases.
2. Update FSAR Section 11.3 to address the impact of the plant capacity factor of 80% applied in calculations of doses from gaseous effluents when typical operating plant capacity factors exceed 90% (see response to RAI 523-4246, Question 11.02-30, ML100770379).
3. Provide a copy of the input/output GASPARD II code files used to calculate the annual gaseous effluent doses and/or calculation packages which show demonstration of compliance for the staff's review.

Request for Additional Information No. 5449

11.04-5

NRC Staff review of FSAR (Rev. 3) Section 11.4 found information that requires updating and/or needs to be addressed in the FSAR. Please update the relevant FSAR sections such as 1.9, 11.4, and 13.5, etc. to satisfy NAPS COL 11.4(9) for identifying the implementation milestones for the epoxy coatings program used in the SWMS, and address the milestones for decontaminable paints and suitable smooth-surface coatings applied to all areas inside the Auxiliary Building including the floor under the pumps of the detergent drain subsystem for compliance with 10 CFR 20.1406 and

conformance to RG 1.54 (Rev. 1) or more recent industry standards and BTP 11-6 as proposed in US-APWR DCD Section 11.4 and COL 11.4(9) (ML092090556 and ML100770379). Please provide a mark-up on the proposed FSAR changes.

Request for Additional Information No. 5450

11.05-6

NRC Staff review of FSAR (Rev. 3) Section 11.2.2 and Figure 11.2-201 (Sheet 6 of 8) found the applicant did not provide sufficient information on process and effluent radiation monitor sensitivity to demonstrate compliance with 10 CFR Part 50, Appendix A, GDC 60 and 64, and SRP Sections 11.2 and 11.5. FSAR Section 11.2.2 states a portion of the [liquid] flow will go through the radiation monitor in the unlikely event that the bypass valve (VLV-531) which is normally locked-closed and tagged is left open or partially open. The in-line process effluent radiation monitor (RE-035) is to initiate pump shutdown, valve closure, and operator actions when the monitor reaches the high setpoint, but can be bypassed along with discharge control valves (RCV-035A/B) to ensure the discharge operation is not interrupted by either failure of control valves and/or radiation monitor. Section 5.5 of ANSI/ANS-55.6-1993 (R2007), referenced in SRP Section 11.2, states that process and effluent radiation monitors shall have sensitivity sufficient to establish that discharges are within established limits and allow determination of the integrated quantity of radioactivity. Please provide a detailed analysis with the methodology, basis, and assumptions which demonstrates that the RE-035 radiation monitor has adequate sensitivity to meet its design objectives under this operation condition with reduced liquid discharge flow rates. Provide a mark-up on the proposed FSAR changes.