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

Serial No. NA3-11-064R
Docket No. 52-017
COL/DWL

DOMINION VIRGINIA POWER
NORTH ANNA UNIT 3 COMBINED LICENSE APPLICATION
SRPs 14.02 and 14.03.08: RESPONSE TO RAI LETTER 91

On November 10, 2011, the NRC requested additional information to support the review of certain portions of the North Anna Unit 3 Combined License Application (COLA). The responses to the following Request for Additional Information (RAI) Questions are provided in Enclosures 1 through 5:

- RAI 6028 Question 14.02-13 Zinc Injection Testing
- RAI 6028 Question 14.02-14 IRSF Testing
- RAI 6033 Question 14.03.08-1 IRSF ITAAC
- RAI 6033 Question 14.03.08-2 IRSF Vault Cover Vents
- RAI 6033 Question 14.03.08-3 IRSF Ventilation Interlocks

This information will be incorporated into a future submission of the North Anna Unit 3 COLA, as described in the enclosures.

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

Very truly yours,

Eugene S. Grecheck

DOB9
NRD

Enclosures:

1. Response to NRC RAI Letter No. 91, RAI 6028 Question 14.02-13
2. Response to NRC RAI Letter No. 91, RAI 6028 Question 14.02-14
3. Response to NRC RAI Letter No. 91, RAI 6033 Question 14.03.08-1
4. Response to NRC RAI Letter No. 91, RAI 6033 Question 14.03.08-2
5. Response to NRC RAI Letter No. 91, RAI 6033 Question 14.03.08-3

Commitments made by this letter:

1. Incorporate proposed changes in a future COLA submission.

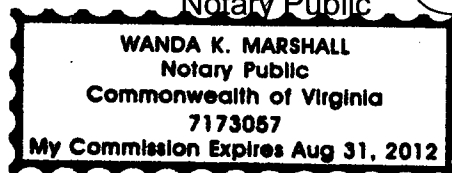
COMMONWEALTH OF VIRGINIA

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 January, 2012
My registration number is 7173057 and my
Commission expires: August 31, 2012

Wanda K. Marshall
Notary Public



cc: U. S. Nuclear Regulatory Commission, Region II
C. P. Patel, NRC
T. S. Dozier, NRC
G. J. Kolcum, NRC

ENCLOSURE 1

Response to NRC RAI Letter 91

RAI 6028, Question 14.02-13

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

**North Anna Unit 3
Dominion
Docket No. 52-017**

RAI NO.: 6028 (RAI Letter 91)

**SRP SECTION: 14.02 – Initial Plant Test Program - Design Certification and
New License Applicants**

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 11/10/2011

QUESTION NO.: 14.02-13

The guidance contained in RG 1.68 "Initial Test Programs for Water-Cooled Nuclear Power Plants," Appendix A "Initial Test Program," Section 1 "Preoperational Testing," subsection n(6) specifies that testing should be provided for chemistry control systems for the reactor coolant system.

US-APWR Design Control Document (DCD) Tier 2 Revision 3 Section 12.1 "Ensuring that Occupational Radiation Exposures are As Low As Reasonably Achievable," states that zinc injection into the reactor coolant system (RCS) is one of the methods available for reducing occupational radiation exposure. US-APWR DCD Tier 2 Table 14A-1 "Conformance Matrix of RG 1.68 Appendix A Guidance Versus Typical Test Abstracts," describes the tests for the reactor coolant system (RCS) chemistry control systems. US-APWR DCD COL 14.2(10) states that the COL applicant is responsible for the testing outside the scope of the certified design in accordance with the test criteria described in subsection 14.2.1.

The North Anna Power Station Unit 3 (NAPS) Combined License (COL) FSAR Appendix 14A "Comparison of RG 1.68 Appendix A versus US-APWR Test Abstracts," response to STD COL 14.2(10) states that US-APWR DCD Tier 2 Table 14A-1 is incorporated by reference and is supplemented by the information contained in NAPS COL FSAR Table 14A-201 "Conformance Matrix of RG 1.68 Appendix A Guidance versus Added Test Abstracts in the FSAR." However, testing of the zinc injection system, consistent with the guidance contained in RG 1.68 Appendix A Item 1.n(6) is not identified in either DCD Table 14A-1 or NAPS COL FSAR Table 14A-201.

Please revise and update NAPS COL FSAR Table 14A-201 to describe testing of the zinc injection system, or provide an alternate method of verifying system functionality and the associated justification.

Dominion Response

The design of North Anna Unit 3 does not include a zinc injection system; therefore, a pre-operational test is not required. The basis for not including this system is provided in Dominion's response to RAI 5979, Question 12.03-12.04-36.

Proposed COLA Revision

None.

ENCLOSURE 2

Response to NRC RAI Letter 91

RAI 6028, Question 14.02-14

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

**North Anna Unit 3
Dominion
Docket No. 52-017**

RAI NO.: 6028 (RAI Letter 91)

**SRP SECTION: 14.02 – Initial Plant Test Program - Design Certification and
New License Applicants**

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 11/10/2011

QUESTION NO.: 14.02-14

The guidance contained in NUREG-0800 Standard Review Plan (SRP) section 14.2 "Initial Plant Test Program - Design Certification And New License Applicants," states that the applicant should describe the tests for Systems Structures or Components (SSC) provided to process or store radioactive materials. The guidance contained in RG 1.68 "Initial Test Programs for Water-Cooled Nuclear Power Plants," describes testing that should be provided for radioactive waste handling and storage systems, including support systems such as radiation monitoring, ventilation, fire protection and heat tracing.

North Anna Power Station Unit 3 (NAPS) Combined License (COL) FSAR Appendix 11AA "Interim Radwaste Storage Facility," which describes the site specific Interim Radwaste Storage Facility (IRSF), discusses a number of design features provided to ensure the safe operation of the IRSF, including, but not limited to:

- Heat tracing on fire water protection system stand pipes
- Leakage detection systems and the associated alarms
- Smoke and fire detection systems
- Ventilation system interlocks

The NAPS COL FSAR Appendix 14A "Comparison of RG 1.68 Appendix A versus US-APWR Test Abstracts," response to STD COL 14.2(10) states that US-APWR Design Control Document (DCD) Tier 2 Table 14A-1 "Conformance Matrix of RG 1.68 Appendix A Guidance Versus Typical Test Abstracts," is incorporated by reference and is supplemented by the information contained in NAPS COL FSAR Table 14A-201

“Conformance Matrix of RG 1.68 Appendix A Guidance versus Added Test Abstracts in the FSAR.” However, testing of components included in the site specific IRSF, consistent with the guidance contained in RG 1.68 Appendix A, are not identified in NAPS COL FSAR Table 14A-201.

Please revise and update NAPS COL FSAR Table 14A-201 to describe testing of components of the site specific IRSF, or provide an alternate method of verifying system functionality and the associated justification.

Dominion Response

A new preoperational test 14.2.12.1.119, “Interim Radwaste Storage Facility Preoperational Test,” will be added to FSAR Section 14.2 and included in FSAR Table 14A-201 to describe conformance with RG 1.68, Appendix A. Components included in the new preoperational test are: heat tracing on fire water stand pipes, leakage detection and associated alarms, smoke and fire detection systems and ventilation system interlocks. Additionally, the preoperational test addresses the IRSF radiation monitors and the passive vault cover ventilation holes.

Proposed COLA Revision

FSAR Section 14.2, Table 14.2-1R, Table 14.2-201, and Table 14A-201 will be revised as indicated on the attached markup.

Markup of North Anna COLA

The attached markup represents Dominion's good faith effort to show how the COLA will be revised in a future COLA submittal in response to the subject RAI. However, the same COLA content may be impacted by revisions to the DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be somewhat different than as presented herein.

**14.2.12.1.114 UHS ESW Pump House Ventilation System
Preoperational Test**

A. Objectives

1. To demonstrate operation of the UHS ESW pump house ventilation system.

B. Prerequisites

1. Required construction testing is completed.
2. Component testing and instrument calibration are completed.
3. Test instrumentation is available and calibrated.
4. Required support systems are available.

C. Test Method

1. Simulate interlock signals for each exhaust fan and unit heater and verify operation and annunciation.
2. Verify that alarms and status indications are functional.
3. Verify design airflow.

D. Acceptance Criteria

1. UHS ESW pump house ventilation system operates on the proper signal (see Subsection 9.4.5).
2. All alarms annunciate properly.

**14.2.12.1.119 Interim Radioactive Waste Storage Facility
Preoperational Test**

A. Objectives

1. To demonstrate operation of the Interim Radwaste Storage Facility (IRSF) structure, systems and components.

B. Prerequisites

1. Required construction testing is completed.
2. Component testing and instrumentation calibration is completed.
3. Test instrumentation is available and calibrated.
4. Required support systems are available.

C. Test Method

1. Verify crane operation for pre-programmed vault positions.
2. Demonstrate the operability of the remote vault cover grapple and remote HIC grapple.
3. Verify manual and automatic system controls, interlocks, alarms, and indications including smoke and fire detection instruments, ventilation fan interlock, leak detection instruments, airborne radiation monitor, and area radiation monitor.
4. Verify operability of heat tracing on fire water protection standpipe.
5. Verify size and location of vault cover ventilation holes.

D. Acceptance Criteria

1. The operation of the facility meets design specifications (Appendix 11AA) to store packaged wastes.

14.2.13 **Combined License Information**

Replace the content of DCD Subsection 14.2.13 with the following.

14.2(1) ***Deleted from the DCD***

NAPS COL 14.2(2)

14.2(2) ***Organization and staffing***

This COL item is addressed in Subsection 14.2.2.

14.2(3) ***Deleted from the DCD.***

14.2(4) ***Deleted from the DCD.***

14.2(5) ***Deleted from the DCD.***

14.2(6) ***Deleted from the DCD.***

NAPS COL 14.2(7)
STD COL 14.2(7)

14.2(7) ***Initial test program schedule and cross-reference of test abstracts with ITAAC***

This COL item is addressed in Subsections 14.2.9, 14.2.11 and Table 14.2-202.

14.2(8) ***Deleted from the DCD.***

14.2(9) Deleted from the DCD.

NAPS COL 14.2(10)
STD COL 14.2(10)

14.2(10) Site-specific test abstracts

This COL item is addressed in Subsections 14.2.12.1.90.C.8, 14.2.12.1.93, 14.2.12.1.113, ~~and~~ 14.2.12.1.114, and 14.2.12.1.119, Table 14.2-201, and Appendix 14A.

STD COL 14.2(11)

14.2(11) First-plant only tests and prototype test

This COL item is addressed in Subsections 14.2.8.1 and 14.2.8.2.1.

STD COL 14.2(12)

14.2(12) Approved Test procedures

This COL item is addressed in Subsection 14.2.3

Table 14.2-1R Comprehensive Listing of Tests (Sheet 4 of 5)

Section	Test
14.2.12.1.117	Compressed Gas System Preoperational Test
14.2.12.1.118	Equipment Hatch Hoist Preoperational Test
<u>14.2.12.1.119</u>	<u>Reserved</u>
14.2.12.2.1.1	RCS Sampling for Fuel Loading
14.2.12.2.1.2	Fuel Loading Instrumentation and Neutron Source Requirements Test
14.2.12.2.1.3	Initial Fuel Loading
14.2.12.2.1.4	Inverse Count Rate Ratio Monitoring for Fuel Loading
14.2.12.2.1.5	Precritical Test Sequence
14.2.12.2.1.6	Rod Drop Time Measurement Test
14.2.12.2.1.7	CRDM Operational Test
14.2.12.2.1.8	Rod Position Indication Test
14.2.12.2.1.9	Rod Control System Test
14.2.12.2.1.10	Reactor Protection System Test
14.2.12.2.1.11	RCS Final Leak Test
14.2.12.2.1.12	Incore Detector Test
14.2.12.2.1.13	RCS Flow Coastdown Test
14.2.12.2.1.14	Operational Alignment of Process Temperature Instrumentation Test
14.2.12.2.2.1	Initial Criticality Test Sequence
14.2.12.2.2.2	Initial Criticality
14.2.12.2.2.3	Determination of Core Power Range for Physics Testing
14.2.12.2.3.1	Low Power Test Sequence
14.2.12.2.3.2	Boron Endpoint Determination Test
14.2.12.2.3.3	Isothermal Temperature Coefficient Measurement Test
14.2.12.2.3.4	RCCA Bank Worth Measurement at Zero Power Test
14.2.12.2.3.5	Pseudo Rod Ejection Test
14.2.12.2.3.6	Operational Alignment of Nuclear Instrumentation Test
14.2.12.2.3.7	Dynamic Automatic Turbine Bypass Control Test

Table 14.2-1R Comprehensive Listing of Tests
(Sheet 4 of 5) (continued)

Section	Test
14.2.12.2.3.8	Pressurizer Heater and Spray Capability and Continuous Spray Flow Verification Test
14.2.12.2.3.9	Natural Circulation Test
14.2.12.2.3.10	Automatic Low Power SG Water Level Control Test
14.2.12.2.4.1	Power Ascension Test Sequence
14.2.12.2.4.2	Power Coefficient Determination Test
14.2.12.2.4.3	Axial Flux Difference Instrumentation Calibration Test and Axial Distribution Oscillation Test
14.2.12.2.4.4	Flux Map Test
14.2.12.2.4.5	RCCA Misalignment Measurement and Radial Power Distribution Oscillation Test
14.2.12.2.4.6	Remote Shutdown Test
14.2.12.2.4.7	Loose Parts Monitoring System Test (Continuation of 14.2.12.1.72)
14.2.12.2.4.8	Automatic Rod Control System Test
14.2.12.2.4.9	Operational Alignment of Process Temperature Instrumentation at Power Test
14.2.12.2.4.10	Thermal Power Measurement and Statepoint Data Collection Test
14.2.12.2.4.1	Power Ascension Test Sequence
14.2.12.2.4.2	Power Coefficient Determination Test
14.2.12.2.4.3	Axial Flux Difference Instrumentation Calibration Test and Axial Distribution Oscillation Test
14.2.12.2.4.4	Flux Map Test
14.2.12.2.4.5	RCCA Misalignment Measurement and Radial Power Distribution Oscillation Test
14.2.12.2.4.6	Remote Shutdown Test
14.2.12.2.4.7	Loose Parts Monitoring System Test (Continuation of 14.2.12.1.72)
14.2.12.2.4.8	Automatic Rod Control System Test
14.2.12.2.4.9	Operational Alignment of Process Temperature Instrumentation at Power Test
14.2.12.2.4.10	Thermal Power Measurement and Statepoint Data Collection Test

Table 14.2-201 Comprehensive Listing of Additional Tests

	Section	Test
STD COL 14.2(10)	14.2.12.1.90.C.8	Local Fire Department Thread Compatibility Test
NAPS DEP 9.2(1)	14.2.12.1.93	Degasifier Subsystem Preoperational Test
STD COL 14.2(10)	14.2.12.1.113	Ultimate Heat Sink (UHS) Preoperational Test
STD COL 14.2(10)	14.2.12.1.114	UHS ESW Pump House Ventilation System Preoperational Test
<u>NAPS COL 14.2(10)</u>	<u>14.2.12.1.119</u>	<u>Interim Radwaste Storage Facility Preoperational Test</u>

Table 14A-201 Conformance Matrix of RG 1.68 Appendix A Guidance versus Added Test Abstracts in the FSAR

	RG 1.68 Appendix A	Section Number	Typical Test
STD COL 14.2(10)	1.h.(7)	14.2.12.1.114	UHS ESW Pump House Ventilation System Preoperational Test
STD COL 14.2(10)	1.h.(10)	14.2.12.1.113	Ultimate Heat Sink (UHS) Preoperational Test
NAPS DEP 9.2(1)	1.n(10)	14.2.12.1.93	Degasifier Subsystem Preoperational Test
STD COL 14.2(10)	1.n(14)(a)	14.2.12.1.114	UHS ESW Pump House Ventilation System Preoperational Test
<u>NAPS COL 14.2(10)</u>	<u>1.l(3)</u> <u>1.n(7)</u> <u>1.n(13)</u> <u>1.n(14)(e)</u> <u>1.n(18)</u>	<u>14.2.12.1.119</u>	<u>Interim Radwaste Storage Facility Preoperational Test</u>

ENCLOSURE 3

Response to NRC RAI Letter 91

RAI 6033, Question 14.03.08-1

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

North Anna Unit 3

Dominion

Docket No. 52-017

RAI NO.: 6033 (RAI Letter 91)

**SRP SECTION: 14.03.08 – Radiation Protection Inspections, Tests, Analyses,
and Acceptance Criteria**

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 11/10/2011

QUESTION NO.: 14.03.08-1

Title 10 of the Code of Federal Regulations (10 CFR), Part 20, "Standards for Protection Against Radiation," Subpart D "Radiation Dose Limits for Individual Members of the Public," states that licensee's are subject to the provisions of Title 40 "Protection of Environment" Code of Federal Regulations (CFR) Part 190 "Environmental Radiation Protection Standards For Nuclear Power Operations." The guidance contained in Standard Review Plan (SRP) Appendix 11.4-A "Design Guidance for Temporary Storage of Low-Level Radioactive Waste" states that the quantity of radioactive material allowed is limited in part by the dose rate criteria of 40 CFR Part 190 which restricts the annual dose radiation from all sources of uranium fuel cycle.

North Anna Power Station Unit 3 (NAPS) Combined License (COL) application Revision 3 "Part 10: Tier 1/ITAAC," Appendix A.6 "Interim Radwaste Storage Facility Radiation Protection and Monitoring," states that the site specific Interim Radwaste Storage Facility (IRSF) shielding design requirements are sufficient to maintain the direct radiation from the on-site storage to site boundary sufficiently low as not to exceed 10 CFR 20.1302 limits. NAPS COL application Table A.6-1 "Interim Radwaste Storage Facility Inspections, Tests, Analyses, and Acceptance Criteria," states that the IRSF shielding is sufficient to meet the maximum radiation criteria of Table A.6-2 "Radiation Zone Designations." The information presented in Table A.6.2 only repeats the criteria for defining the radiation zones within the plant describe in the US-APWR Design Control Document (DCD) Figure 12.3-1 "Radiation Zones for Normal Operation/Shutdown." Therefore, Appendix A.6 and Table A.6.2 do not describe how the Inspections, Test, Analysis and Acceptance Criteria (ITAAC) for the IRSF demonstrate compliance with the all of the requirements of 10 CFR 20 Subpart D.

Please revise and update NAPS COL application Appendix A.6 and Table A.6.2 to describe the ITAAC provided to demonstrate that the IRSF meets all of the criteria of 10 CFR 20 Subpart D, or provide the specific alternative approaches used and the associated justification.

Dominion Response

COLA Part 10, Appendix A.6, "Interim Radwaste Storage Facility Radiation Protection and Monitoring," was revised by the December 2011 COLA submission. As a part of this revision, Table A.6-1, "Interim Radwaste Storage Facility Inspections, Tests, Analyses, and Acceptance Criteria," was changed to include a verification that the as-built IRSF shielding walls and ceilings conform to the concrete thickness dimensions specified in FSAR Table 11AA-204. FSAR Table 11AA-204 was also revised to add a note that identifies tolerances for the thickness dimensions.

FSAR Subsection 11AA.3.2 states that the wall and cover thicknesses specified in Table 11AA-204 provide sufficient shielding protection so that any individual external to the IRSF would receive no more than 0.25 mrem/hr. FSAR Subsection 12.2.1.1.10 states that the Radiation Protection Program (RPP) ensures that the exposure from radiation sources at the IRSF complies with 10 CFR 20 (which includes Subpart D for offsite doses) and 40 CFR 190.

For consistency and completeness, FSAR Subsection 11AA.1.2 will be revised to add to the IRSF shielding design criteria a reference to the limits in 10 CFR 20 Subpart D and 40 CFR 190. Additionally, a note will be added to Table 11.3-202, to indicate that the dose contribution from the IRSF is negligible to the total offsite doses, which are well below the limits specified in 10 CFR 20 Subpart D and 40 CFR 190.

Proposed COLA Revision

FSAR Table 11.3-202 and Subsection 11AA.1.2 will be revised as indicated on the attached markup.

Markup of North Anna COLA

The attached markup represents Dominion's good faith effort to show how the COLA will be revised in a future COLA submittal in response to the subject RAI. However, the same COLA content may be impacted by revisions to the DCD, responses to other COLA RAIs, other COLA changes, plant design changes, editorial or typographical corrections, etc. As a result, the final COLA content that appears in a future submittal may be somewhat different than as presented herein.

NAPS COL 11.3(6) Table 11.3-202 Comparison of Site Doses with 40 CFR 190 Limits
NAPS ESP COL 11.1-1
NAPS ESP VAR 11.3-2

Type of Dose	ESP Site Total ⁽¹⁾	Dose (mrem/yr)						
		Unit 3 ⁽²⁾⁽⁶⁾			Units 1 and 2 ⁽³⁾	ISFSI ⁽⁴⁾	Site Total ⁽⁵⁾	40 CFR 190 Limit
		Liquid	Gas	Total				
Total Body	6.8E+00	5.9E-01	1.2E+00	1.8E+00	1.4E+00	3.6E+00	6.7E+00	25
Thyroid	2.7E+01	4.9E-01	1.4E+00	1.9E+00	1.5E+00	3.6E+00	7.0E+00	75
Bone	1.2E+01	1.5E-01	4.7E+00	4.8E+00	1.5E+00	3.6E+00	9.9E+00	25

Note:

1. ESP doses are from ESP-ER Table 5.4-11.
2. Unit 3 liquid and gaseous effluent doses are from Tables 11.2-15R and 11.3-9R, respectively.
3. Doses from Units 1 and 2 are based on liquid and gaseous effluents and an assumed direct radiation total dose from both units of 1 mrem/yr.
4. The ISFSI dose is based on the ISFSI fully loaded with 84 casks.
5. Doses that exceed the corresponding ESP values are shown in bold.
6. Unit 3 total dose includes the direct radiation dose contribution from the IRSF, and is negligible to the total site boundary dose.

- Provide leak monitoring capability

11AA.1.2 Design Criteria

In order to meet the above objectives, the following specific criteria are satisfied:

- The design and operation of the IRSF assure that the radiological consequences of design basis events (fire, flood, and tornado) do not exceed a small fraction of the 10 CFR 100 dose limit.
- The IRSF has sufficient shielding to maintain the direct radiation from the on-site storage to site boundary sufficiently low as not to exceed 10 CFR 20.1302-limit, 10 CFR 20 Subpart D, and 40 CFR 190 limits.
- The IRSF has remote waste handling capability to move waste containers received from a truck into storage vaults or to move waste containers out of storage vaults onto a truck for shipping.
- As hydrogen and other combustible gases are generated from the radiolysis and hydrolysis reactions, the IRSF has a ventilation design to prevent the buildup of these gases to the lower flammability limit.
- The IRSF provides the capability for inspecting the waste container integrity on a periodic basis.
- The IRSF has the capability for monitoring potential leakage from containers in storage. A drainage collection is provided to collect contaminated liquid for shipment to the LWMS for treatment.
- The IRSF includes design features, in accordance with 10 CFR 20.1406, that would minimize, to the extent practicable, contamination of the waste facility and environment; facilitate eventual decommissioning; and minimize the generation of extraneous radioactive waste.
- The IRSF has the capability to monitor radionuclides present in the potential release pathways.
- The total radioactive material inventory limit is established, based on the design of the storage area, dose limits for members of the public, and safety features provided.

ENCLOSURE 4

Response to NRC RAI Letter 91

RAI 6033, Question 14.03.08-2

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

North Anna Unit 3

Dominion

Docket No. 52-017

RAI NO.: 6033 (RAI Letter 91)

**SRP SECTION: 14.03.08 – Radiation Protection Inspections, Tests, Analyses,
and Acceptance Criteria**

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 11/10/2011

QUESTION NO.: 14.03.08-2

Title 10 of the Code of Federal Regulations (10 CFR), Part 50 "Domestic Licensing of Production and Utilization Facilities" Appendix A "General Design Criteria for Nuclear Power Plants" (GDC) Criterion 61 "Fuel storage and handling and radioactivity control," requires that the solid waste management systems be designed to ensure adequate safety. The guidance contained in NUREG-0800 Standard Review Plan (SRP), Section 11.4, "Solid Waste Management System," specifies that the applicant should identify Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) provided for Systems, Structures and Components containing radioactive material.

North Anna Power Station Unit 3 (NAPS) Combined License (COL) FSAR Appendix 11AA "Interim Radwaste Storage Facility" subsection 11AA.2 "Facility Description," and subsection 11AA.3.5 "Gas Generation," state that the site specific Interim Radwaste Storage Facility (IRSF) resin storage vault covers have passive ventilation holes to prevent accumulation of explosive gases inside a storage vault. FSAR Appendix 11AA further states that vault cover ventilation holes, in conjunction with the building exhaust fan, prevent the accumulation of explosive gases within the IRSF. However, North Anna Power Station Unit 3 (NAPS) Combined License (COL) application Revision 3 "Part 10: Tier 1/ITAAC," Table A.6-1 "Interim Radwaste Storage Facility Inspections, Tests, Analyses, and Acceptance Criteria," does not describe any ITAAC provided to assure that the IRSF has been constructed in a manner that prevents the accumulation of explosive gases.

Please revise and update NAPS COL application Appendix A.6 to describe the ITAAC provided to verify the construction of the design features provided to prevent the

accumulation of explosive gases in the IRSF, or provide the specific alternative approaches used and the associated justification.

Dominion Response

Regulatory Guide 1.206, C.II.1.2.7, "ITAAC for Plant Systems," and Standard Review Plan 14.3.7 do not specify ITAAC for this type of solid waste storage facility beyond meeting the 10 CFR 20 dose limits for storage in a solid waste management system (permanently installed systems or in combination with mobile processing equipment). COLA Part 10, Table A.6-1, ITAAC Item 2 ensures that the wall and ceiling thicknesses of the IRSF provide the necessary shielding so that the offsite and worker doses are well below 10 CFR 20 and 40 CFR 190 limits.

As discussed in the response to RAI 6028, Question 14.02-14 (Enclosure 2 of this letter), a new IRSF preoperational test will be added to FSAR Section 14.2. The preoperational test will verify that the size and location of the as-built vault cover ventilation holes are consistent with the design.

In summary, the vault cover ventilation holes do not perform a risk-significant function and, based on the regulatory guidance, do not require an ITAAC. The purpose of an ITAAC, however, will be satisfied by the performance of the IRSF preoperational test.

Proposed COLA Revision

None.

ENCLOSURE 5

Response to NRC RAI Letter 91

RAI 6033, Question 14.03.08-3

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

North Anna Unit 3

Dominion

Docket No. 52-017

RAI NO.: 6033 (RAI Letter 91)

**SRP SECTION: 14.03.08 – Radiation Protection Inspections, Tests, Analyses,
and Acceptance Criteria**

QUESTIONS for Health Physics Branch (CHPB)

DATE OF RAI ISSUE: 11/10/2011

QUESTION NO.: 14.03.08-3

Title 10 of the Code of Federal Regulations (10 CFR), Part 50 "Domestic Licensing of Production and Utilization Facilities" Appendix A "General Design Criteria for Nuclear Power Plants" (GDC) Criterion 61 "Fuel storage and handling and radioactivity control," requires that the solid waste management systems be designed to ensure adequate safety. The guidance contained in NUREG-0800 Standard Review Plan (SRP), Section 11.4, "Solid Waste Management System," specifies that the applicant should identify Inspections, Tests, Analyses, and Acceptance Criteria (ITAAC) provided for Systems, Structures and Components containing radioactive material.

North Anna Power Station Unit 3 (NAPS) Combined License (COL) application Revision 3 "Part 10: Tier 1/ITAAC," Appendix A.6 "Interim Radwaste Storage Facility Radiation Protection and Monitoring," Section A.6.1 "Design Description," states that the site specific Interim Radwaste Storage Facility (IRSF) does not have any interlocks. However, North Anna Power Station Unit 3 (NAPS) Combined License (COL) FSAR Subsection 11AA.4.3 "Fire Protection System and Fire Hazards Analysis," states that the radiation monitors and smoke detectors are interlocked with the building exhaust. In addition, NAPS COL application Table A.6-1 "Interim Radwaste Storage Facility Inspections, Tests, Analyses, and Acceptance Criteria," does not describe any ITAAC provided to assure that the IRSF has been constructed in a manner that prevents the release of smoke containing radioactive material.

Please revise and update NAPS COL application Appendix A.6 to describe the ITAAC provided to verify the construction of the design features provided to prevent the release of radioactive materials from the IRSF, or provide the specific alternative approaches used and the associated justification.

Dominion Response

Regulatory Guide 1.206, C.II.1.2.7, "ITAAC for Plant Systems," and Standard Review Plan 14.3.7 do not specify ITAAC for this type of solid waste storage facility beyond meeting the 10 CFR 20 dose limits for storage in a solid waste management system (permanently installed systems or in combination with mobile processing equipment). COLA Part 10, Table A.6-1, ITAAC No. 2 ensures that the wall and ceiling thicknesses of the IRSF provide the necessary shielding so that the offsite and worker doses are well below 10 CFR 20 and 40 CFR 190 limits.

COLA Part 10, Appendix A.6, "Interim Radwaste Storage Facility Radiation Protection and Monitoring," was revised by the December 2011 COLA submission. As a part of this revision, the erroneous statement that the "area and airborne radioactivity monitoring system within the IRSF has no interlocks," was deleted.

As described in FSAR Subsection 11AA.4.3.2.1, the IRSF is equipped with smoke detectors and an automatic fire suppression sprinkler system. The truck bay/storage vault areas have a significant internal volume, sufficient to dilute the smoke released for any potential fire, and the ventilation system is interlocked with the smoke detection system to shutdown the exhaust fan when smoke is detected. The compartmentalized design of the IRSF allows any fire that may occur to be confined to its immediate general zone of influence and within the fire zone of occurrence.

As discussed in the response to RAI 6028, Question 14.02-14 (Enclosure 2 of this letter), a new IRSF preoperational test will be added to FSAR Section 14.2. The test includes verification of manual and automatic system controls, interlocks, alarms, and indications, including smoke and fire detection instruments, ventilation fan interlocks, and radiation monitors.

In summary, the smoke detector and ventilation fan interlocks do not perform a risk-significant function and, based on the regulatory guidance, do not require an ITAAC. The purpose of an ITAAC, however, will be satisfied by the performance of the IRSF preoperational test, which will verify the smoke detector and ventilation fan interlocks and the performance of the radiation monitors. In addition, the functional arrangement of the IRSF radiation monitors will be verified by COLA Part 10, Table A.6-1, ITAAC Item 1.

Proposed COLA Revision

None.