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Dominion®

July 23, 2008

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

Serial No. NA3-08-054R
Docket No. 52-017
COL/BCB

DOMINION VIRGINIA POWER
NORTH ANNA UNIT 3 COMBINED LICENSE APPLICATION
RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 008

On June 11, 2008, 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 RAIs are provided in Enclosures 1 through 15:

- RAI Question 09.05.01-1 Fire Protection Program Change Process
- RAI Question 09.05.01-2 Multiple Spurious Actuations
- RAI Question 09.05.01-3 NFPA 804 Applicability
- RAI Question 09.05.01-4 Hose Station Coverage in Containment
- RAI Question 09.05.01-5 Control of Combustibles in Rooms Adjacent to MCR
- RAI Question 09.05.01-6 Control Combustibles Below Floor in MCR Complex
- RAI Question 09.05.01-7 Control of Combustibles in Computer Rooms
- RAI Question 09.05.01-8 Quality of Fire Water Sources
- RAI Question 09.05.01-9 COLA Reference to NFPA 55
- RAI Question 09.05.01-10 Communication System for Fire Brigade
- RAI Question 09.05.01-11 Fire Protection Program QA
- RAI Question 09.05.01-12 Fire Brigade Leader Qualifications
- RAI Question 09.05.01-13 Storage of Hazardous Chemicals
- RAI Question 09.05.01-14 Storage of Unused Ion Exchange Resins
- RAI Question 09.05.01-15 Fire Barrier Testing

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NRO

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

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 23rd day of July, 2008
My registration number is 7173057 and my
Commission expires: August 31, 2012

Wanda K. Marshall
Notary Public

WANDA K. MARSHALL
Notary Public
Commonwealth of Virginia
7173057
My Commission Expires Aug 31, 2012

Enclosures:

1. Response to NRC RAI Letter No. 008, RAI Question No. 09.05.01-1
2. Response to NRC RAI Letter No. 008, RAI Question No. 09.05.01-2
3. Response to NRC RAI Letter No. 008, RAI Question No. 09.05.01-3
4. Response to NRC RAI Letter No. 008, RAI Question No. 09.05.01-4
5. Response to NRC RAI Letter No. 008, RAI Question No. 09.05.01-5
6. Response to NRC RAI Letter No. 008, RAI Question No. 09.05.01-6
7. Response to NRC RAI Letter No. 008, RAI Question No. 09.05.01-7
8. Response to NRC RAI Letter No. 008, RAI Question No. 09.05.01-8
9. Response to NRC RAI Letter No. 008, RAI Question No. 09.05.01-9
10. Response to NRC RAI Letter No. 008, RAI Question No. 09.05.01-10
11. Response to NRC RAI Letter No. 008, RAI Question No. 09.05.01-11
12. Response to NRC RAI Letter No. 008, RAI Question No. 09.05.01-12
13. Response to NRC RAI Letter No. 008, RAI Question No. 09.05.01-13
14. Response to NRC RAI Letter No. 008, RAI Question No. 09.05.01-14
15. Response to NRC RAI Letter No. 008, RAI Question No. 09.05.01-15

Commitments made by this letter:

1. The information provided in the RAI responses will be incorporated into a future submission of the North Anna Unit 3 COLA, as described in the Enclosures.

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 No. 008

RAI Question No. 09.05.01-1

NRC RAI 09.05.01-1

STD COLA 9.5.1-9-A states that the criterion for self-approval of changes that impact the fire protection program will be "no adverse affect on safe shutdown." As noted in Regulatory Position 1.8.1 of Regulatory Guide (RG) 1.189, Revision 1, this criterion should not be applied to new reactor plants. The change process for new reactor fire protection programs should be the same as that for the rest of the plant, i.e. in accordance with 10 CFR 52.98(c). The COL application should be revised accordingly.

Dominion Response

FSAR, Revision 0, Section 9.5.1.15.2 addresses COL Item 9.5.1-9-A from DCD, Revision 4. This COL Item required the Applicant to provide a proposed fire protection license condition for making changes to the fire protection system without prior review and approval of the NRC (a requirement of Regulatory Guide 1.189 Revision 1, for nuclear plants licensed in accordance with 10 CFR Part 50). However, as discussed in the RAI, this requirement should not be applied to new reactor plants.

The inconsistency between the DCD and the NRC guidance and regulations was addressed in Revision 5 of the DCD, with the deletion of COL Item 9.5.1-9-A and revision of Section 9.5.1.15.2 (thirteenth bullet). These changes eliminated the requirement for the COL Applicant to provide a proposed license condition for the fire protection program. Therefore, the information in FSAR Section 9.5.1.15.2 is no longer required. As a result, the change process for the North Anna Unit 3 fire protection program will be the same as that for the balance of the plant.

Proposed Revision to the COLA

FSAR Sections 9.5.1.15.2, 9.5.1.16, and Table 1.10-201 will be revised to reflect the deletion of DCD COL Item 9.5.1-9-A.

These changes are shown on the attached FSAR markups.

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 ESBWR 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 SUP 1.10-1

Table 1.10-201 Summary of FSAR Sections Where DCD COL Items Are Addressed

Item No.	Subject/Description of Item	FSAR Section
9.5.1-5-A	Fire Barriers	9.5.1.10
9.5.1-6-H	Smoke Control	9.5.1.11
9.5.1-7-H	Fire Hazards Analysis (FHA) Compliance Review	9.5.1.12
9.5.1-8-A	Fire Protection (FP) Program Description	9.5.1.15
9.5.1-10-H	Fire Brigade	9.5.1.15.4, 13.1.2.1.5
9.5.1-11-A	Quality Assurance	9.5.1.15.9
9.5.2.5-1-A	Offsite Interfaces	9.5.2.2
9.5.2.5-2-A	Grid Transmission Operator	9.5.2.2
9.5.4-1-A	Fuel Oil Capacity	9.5.4.2
9.5.4-2-A	Protection of Underground Piping	9.5.4.2
9A.7-1-A	Yard Fire Zone Drawings	9A.4.7
9A.7-2-A	Fire Hazards Analysis for Site Specific Areas	9A.4.7, 9A.5.7, 9A.5.8, 9A.5.9, and 9A.5.10
10.2-1-A	Turbine Maintenance and Inspection Program	10.2.3.6
10.2-2-A	Turbine Missile Probability Analysis	10.2.3.8
10.4-1-A	Leakage (of Circulating Water Into the Condenser)	10.4.6.3
11.2-1-A	Implementation of IE Bulletin 80-10	11.2.2.3
11.2-2-A	Implementation of Part 20.1406	11.2.2.3
11.4-1-A	Process System Regulatory Guide Compliance	11.4.2.3
11.4-2-A	Compliance with IE Bulletin 80-10	11.4.2.3
11.4-3-A	Process Control Program	11.4.2.3
11.4-4-A	Temporary Storage Facility	11.4.1
11.4-5-A	Compliance with Part 20.1406	11.4.1
11.5-1-A	Subsystem Lower Limit of Detection	11.5.4.7
11.5-2-A	Offsite Dose Calculation Manual	11.5.4.4, 11.5.4.5, and 11.5.5.8

operational prior to receipt for new fuel. Other required elements of the Fire Protection Program described in this section are fully operational prior to initial fuel loading per Section 13.4.

9.5.1.15.1 **Fire Protection Program Criteria**

Add the following at the end of this section.

NAPS SUP 9.5.1-1

Table 9.5-201 supplements DCD Table 9.5-1.

9.5.1.15.2 ~~**Organization and Responsibilities**~~ **[Deleted]**

~~Replace the last sentence of the thirteenth bullet as follows.~~

~~**STD COL 9.5.1-9-A**~~

~~Control of changes to the fire protection program is defined in a license condition. Changes to the approved fire protection program may be made without prior approval of the NRC only if these changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.~~

9.5.1.15.4 **Onsite Fire Operations Training**

Replace the first paragraph with the following.

NAPS COL 9.5.1-10-H

Implementation of the fire brigade will be in accordance with the milestones in Section 13.4 for the Fire Protection Program.

9.5.1.15.6 **Control of Combustible Material; Hazardous Materials and Ignition Sources**

Add the following at the end of this section.

STD SUP 9.5.1-3

- In rooms adjacent to the main control room and in computer rooms that are not part of the control room complex:
  - Transient combustible materials are not left unattended during lunch breaks, shift changes, or other similar periods unless stored in approved containers.
  - Electrical appliances and other potential ignition sources are controlled.
- Prohibit the storage of transient combustibles below the raised floor in the main control complex.

9.5.1-8-A **Fire Protection Program Description**

STD COL 9.5.1-8-A This COL item is addressed in Section 9.5.1.15.

9.5.1-9-A ~~**Fire Protection Program License Changes**~~ **[Deleted]**

~~**STD COL 9.5.1-9-A**~~ ~~This COL item is addressed in Section 9.5.1.15.2.~~

9.5.1-10-H **Fire Brigade**

NAPS COL 9.5.1-10-H This COL item is addressed in Sections 9.5.1.15.4 and 13.1.2.1.5.

9.5.1-11-A **Quality Assurance**

STD COL 9.5.1-11-A This COL item is addressed in Section 9.5.1.15.9.

DCD Table 9.5-2

NAPS COL 9.5.1-1-A Delete the "*" and "**" footnotes.

9.5.2 **Communications System**

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

9.5.2.2 **System Design Description**

Emergency Communication Systems

Replace the last sentence of the first bullet with the following.

NAPS COL 9.5.2.5-1-A

The North Anna Emergency Notification System (ENS) is provided in the plant Emergency Plan. The ENS phone lines are routed directly to the local telephone company central office via fiber-optic phone lines through a telephone utility switch that is located on site in the telephone equipment building. The normal power for this device is non-safety related station power. The telephone system will lose its normal power supply during a loss of offsite power; however, the phone system is battery backed for a period of approximately eight hours. This design ensures that the ENS located at the site is fully operable from the site in the event of a loss of offsite power at the site and is in compliance with the requirements of NRC Bulletin 80-15 for the ENS. Automatic Ringdown Circuits (ARD) (described in the plant Emergency Plan) connect the plant to the local and state emergency offices, and are also normally powered from the non-safety related station power and backed with approximately eight hours of battery backup power. In addition to the connections to the local telephone company, a separate Company-owned and maintained fiber-optic network exists which

ENCLOSURE 2

Response to NRC RAI Letter No. 008

RAI Question No. 09.05.01-2

NRC RAI 09.05.01-2

Multiple Spurious Actuations – RG 1.206, Regulatory Position C.III.1, Section C.I.9.5.1.1 identifies that the COL applicant should provide the final postfire safe-shutdown analysis. RG 1.189, Revision 1 identifies that the one-at-a-time assumption for spurious actuations may not adequately address the potential risk attributed to fire. What assumptions and methodologies will be used by the applicant to identify, assess and resolve the potential for multiple spurious actuations that may prevent post-fire safe shutdown?

Dominion Response

During a DCWG conference call on July 9, 2008, the NRC ESBWR Project Manager stated that Dominion did not need to provide a response to this RAI since the NRC will issue a DCD RAI to GEH to address this question.

Consistent with NRC direction, Dominion is not providing a response to this RAI.

Proposed COLA Revision

None.

ENCLOSURE 3

Response to NRC RAI Letter No. 008

RAI Question No. 09.05.01-3

NRC RAI 09.05.01-3

NFPA 804 Applicability – RG 1.206; Regulatory Position C.III.1, Section C.I.9.5.1.1 identifies that the COL applicant should provide the list of industry codes and standards with applicable edition and any deviation from the code requirements with justification. The North Anna COLA as per Table 1.9-201 conforms to RG 1.189 but also incorporates by reference NFPA 804 as the applicable standard in various sections. NFPA 804 has not been endorsed by the NRC and some conflicts have been identified. The applicant should verify that where conflicts exist between NFPA 804 and NRC regulatory requirements and guidance, the latter will govern. Deviations from regulatory requirements and guidance should be identified and addressed in the application.

Dominion Response

The North Anna Unit 3 COLA identifies and addresses conformance with regulatory requirements and guidance, including RG 1.189.

The FSAR incorporates by reference the DCD, including any references and exceptions (refer to DCD Table 1.9-21) to RG 1.189 and to NFPA 804. The DCD addresses conformance with the aspects of RG 1.189 that involve standard plant design information, while FSAR Table 1.9-202 addresses conformance with RG 1.189 for operational and site-specific design information.

As indicated in FSAR Table 1.9-202, the COLA conforms to RG 1.189 (with one exception). Should a conflict arise regarding compliance with RG 1.189 and NFPA 804 with respect to operational or site specific issues, the COLA requires conformance with RG 1.189.

Proposed COLA Revision

None.

ENCLOSURE 4

Response to NRC RAI Letter No. 008

RAI Question No. 09.05.01-4

NRC RAI 09.05.01-4

RG 1.206, Regulatory Position C.III.1, Section C.I.9.5.1.1 identifies that the COL applicant should provide information on the fire protection operational program including procedures. The ESBWR DCD Table 9A.5-1 identifies that Class III hose station coverage for all areas inside containment will be provided by hoses connected to hose station locations outside containment near access hatches. The staff requests that the COL applicant provide a discussion of its methodology for verifying that the specified coverage will be provided and describe the plant procedures and requirements that will ensure that the necessary equipment is provided (e.g., hoses, nozzles) to ensure the specified coverage during the plant conditions (e.g., refueling outages) when they are required.

Dominion Response

The DCD and FSAR Section 13.5 include controls to ensure that the specified coverage will be provided when required.

Initial Verification of Hose Station Coverage in Containment

The FSAR incorporates by reference the DCD, which specifies the methodology for verifying adequate hose coverage inside containment, including inspection requirements and acceptance criteria.

DCD Revision 5, Tier 1 Table 2.16.3-2, Item 3c, requires the COL Holder to verify manual fire suppression capability inside containment. The specific requirements described in this ITAAC are:

Design Commitment

3. The FPS provides for manual fire suppression capability to plant areas containing safe shutdown equipment.

Inspection Test and Analyses

c. Inspection of the as-built manual fire suppression system will be performed to verify that any location within Containment can be reached by two effective hose streams with a maximum of 61 meters (200 feet) of hose.

Acceptance Criteria

c. Standpipe and hose rack stations are located such that any location within Containment can be reached by an effective hose stream (9.1 m [30 ft]) with a maximum of 61 m (200 ft) of hose from each of two hose stations on separate standpipes.

Completion of this ITAAC ensures that hose station coverage for all areas inside containment is provided. DCD Revision 5, including this ITAAC, will be incorporated into a future submission of the COLA.

Ongoing Availability of Equipment

The FSAR incorporates by reference DCD Section 9.5.1.15.2, which states that the site engineer in charge of the Fire Protection Program is responsible for:

- Assuring the availability and acceptability of Fire Protection System and components and manual fire fighting equipment;
- Preparing procedures to meet possible fire situations in the plant and for assuring assistance is available for fighting fires in radiological areas; and
- Ensuring that periodic maintenance and testing of fire protection systems, components, and manual fire fighting equipment is conducted, test results are evaluated, and the acceptability of systems under test is determined in accordance with established plant procedures.

These program requirements will be implemented by plant administrative procedures, as described by FSAR 13.5.1.1, and will ensure that the necessary equipment is provided to ensure the specified coverage during the plant conditions when they are required.

Proposed COLA Revision

None.

ENCLOSURE 5

Response to NRC RAI Letter No. 008

RAI Question 09.05.01-5

NRC RAI 09.05.01-5

RG 1.206, Regulatory Position C.III.1, Section C.I.9.5.1.1 identifies that the COL applicant should provide information on the fire protection operational program including the combustible control program. The ESBWR DCD took exception to the BTP SPLB 9.5-1 (RG 1.189 for North Anna 3) guidance to provide automatic suppression in the rooms adjacent to the main control room. One basis for this exception is that the paper used in these rooms will be stored in file cabinets, bookcases, or other storage locations except when in use. Piles of paper on desktops and paper in open bookcases contribute to the combustible loading in a room. Describe the applicant's program to control the fire hazard presented by paper or other combustible materials, as well as potential ignition sources (e.g., coffee makers), in these rooms.

Dominion Response

The FSAR incorporates by reference DCD Section 9.5.1. The control of combustible materials and ignition sources is addressed in DCD Section 9.5.1.15.6, "Control of Combustible Materials, Hazardous Materials and Ignition Sources." This section requires that administrative procedures control combustible materials by imposing the following controls:

- Minimize waste, debris, scrap, and oil spills or other combustibles resulting from a work activity in the power block while work is in progress and remove the same upon completion of the activity or at the end of each work shift;
- Govern periodic inspections for accumulation of combustibles and to ensure continued compliance with these administrative controls; and
- Govern the control of electrical appliances in areas that contain or expose safe shutdown equipment.

In addition to the administrative controls described above, the FSAR will be revised to include administrative requirements to specifically control combustible materials and potential ignition sources in rooms adjacent to the main control room.

Proposed COLA Revision

FSAR Section 9.5.1.15.6 will be revised to add the following requirements.

- In rooms adjacent to the main control room and in computer rooms that are not part of the control room complex:
  - Transient combustible materials are not left unattended during lunch breaks, shift changes, or other similar periods unless stored in approved containers.
  - Electrical appliances and other potential ignition sources are controlled.

These changes are shown on the attached FSAR 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 ESBWR 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.

operational prior to receipt for new fuel. Other required elements of the Fire Protection Program described in this section are fully operational prior to initial fuel loading per Section 13.4.

9.5.1.15.1 **Fire Protection Program Criteria**

Add the following at the end of this section.

NAPS SUP 9.5.1-1

Table 9.5-201 supplements DCD Table 9.5-1.

9.5.1.15.2 ~~**Organization and Responsibilities**~~ **[Deleted]**

~~Replace the last sentence of the thirteenth bullet as follows.~~

~~**STD COL 9.5.1-9-A**~~

~~Control of changes to the fire protection program is defined in a license condition. Changes to the approved fire protection program may be made without prior approval of the NRC only if these changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.~~

9.5.1.15.4 **Onsite Fire Operations Training**

Replace the first paragraph with the following.

NAPS COL 9.5.1-10-H

Implementation of the fire brigade will be in accordance with the milestones in Section 13.4 for the Fire Protection Program.

9.5.1.15.6 Control of Combustible Material; Hazardous Materials and Ignition Sources

Add the following at the end of this section.

STD SUP 9.5.1-3

- In rooms adjacent to the main control room and in computer rooms that are not part of the control room complex:
  - Transient combustible materials are not left unattended during lunch breaks, shift changes, or other similar periods unless stored in approved containers.
  - Electrical appliances and other potential ignition sources are controlled.
- Prohibit the storage of transient combustibles below the raised floor in the main control complex.

ENCLOSURE 6

Response to NRC RAI Letter No. 008

RAI Question No. 09.05.01-6

NRC RAI 09.05.01-6

RG 1.206, Regulatory Position C.III.1, Section C.I.9.5.1.1 identifies that the COL applicant should provide information on the fire protection operational program including the combustible control program. The ESBWR DCD took exception to providing automatic fire suppression below the raised floor in the Main control room complex in accordance with the guidance in BTP SPLB 9.5-1. One justification for not having automatic suppression in this area is that there are no transient combustibles in this area during normal activities. Describe the approach to restricting transient combustibles in this area. Also describe the extent to which cabling below the raised floor will be contained in conduit.

Dominion Response

The FSAR incorporates by reference DCD Section 9.5.1. The control of combustible material and ignition sources are addressed in DCD Section 9.5.1.15.6, "Control of Combustible Materials, Hazardous Materials and Ignition Sources." This section requires that administrative procedures control combustible materials by imposing the following controls:

- Prohibit the storage of combustible materials (including unused ion exchange resins) in areas that contain or expose safe shutdown equipment or establish designated storage areas with appropriate fire protection;
- Govern the handling of and limit transient fire loads such as flammable liquids, wood and plastic materials in the power block;
- Assign responsibility to the appropriate supervisor for reviewing work activities to identify transient fire loads; and
- Control the use of specific combustibles in the powerblock. All wood used in the power block during maintenance, modification, or refueling operation (such as lay-down blocks or scaffolding) is treated with a flame retardant. Equipment or supplies (such as new fuel) shipped in untreated combustible packing containers may be unpacked in the power block if required for valid operating reasons. However, all combustible materials are removed from the area immediately following unpacking. Such transient combustible material, unless stored in approved containers, is not left unattended in the powerblock during lunch breaks, shift changes, or other similar periods. Loose combustible packing material such as wood or paper excelsior, or polyethylene sheeting is placed in metal containers with tight-fitting self-closing metal covers. Only noncombustible panels or flame-retardant tarpaulins or approved materials of equivalent fire-retardant characteristics are used in the powerblock. Any other fabrics

or plastic films used in the powerblock are certified to conform to the large-scale fire test described in NFPA 701.

In addition to the administrative controls described above, the FSAR will be revised to include an administrative requirement that specifically prohibits the storage of transient combustibles below the raised floor in the main control complex.

The design of the cable routing below the raised floor in the main control room is within the scope of the DCD, which is the responsibility of GEH. There are no site-specific design criteria for cable routing in the main control room complex. GEH will determine the extent to which cabling below the raised floor will be contained in conduit as part of the detailed standard plant design.

Proposed COLA Revision

FSAR Section 9.5.1.15.6 will be revised to add the following requirement:

- Prohibit the storage of transient combustibles below the raised floor in the main control complex.

This change is shown on the attached FSAR 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 ESBWR 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.

operational prior to receipt for new fuel. Other required elements of the Fire Protection Program described in this section are fully operational prior to initial fuel loading per Section 13.4.

9.5.1.15.1 **Fire Protection Program Criteria**

Add the following at the end of this section.

NAPS SUP 9.5.1-1

Table 9.5-201 supplements DCD Table 9.5-1.

9.5.1.15.2 ~~**Organization and Responsibilities**~~ **[Deleted]**

~~Replace the last sentence of the thirteenth bullet as follows.~~

~~**STD COL 9.5.1-9-A**~~

~~Control of changes to the fire protection program is defined in a license condition. Changes to the approved fire protection program may be made without prior approval of the NRC only if these changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.~~

9.5.1.15.4 **Onsite Fire Operations Training**

Replace the first paragraph with the following.

NAPS COL 9.5.1-10-H

Implementation of the fire brigade will be in accordance with the milestones in Section 13.4 for the Fire Protection Program.

9.5.1.15.6 **Control of Combustible Material; Hazardous Materials and Ignition Sources**

Add the following at the end of this section.

STD SUP 9.5.1-3

- In rooms adjacent to the main control room and in computer rooms that are not part of the control room complex:
  - Transient combustible materials are not left unattended during lunch breaks, shift changes, or other similar periods unless stored in approved containers.
  - Electrical appliances and other potential ignition sources are controlled.
- Prohibit the storage of transient combustibles below the raised floor in the main control complex.

ENCLOSURE 7

Response to NRC RAI Letter No. 008

RAI Question No. 09.05.01-7

NRC RAI 09.05.01-7

RG 1.206, Regulatory Position C.III.1, Section C.I.9.5.1.1 identifies that the COL applicant should provide information on the fire protection operational program including the combustible control program. The ESBWR DCD took exception to RG 1.189 guidance to provide fixed automatic suppression for computer rooms for computers performing functions important to safety that are not part of the Control Room Complex. As per the DCD, these areas do have ionization smoke detectors but do not have automatic suppression. One basis for this exception is that the paper used in these rooms will be stored in file cabinets, bookcases, or other storage locations except when in use. Another basis is that the amount of transient combustibles is limited. Piles of paper on desktops and paper in open bookcases contribute to the combustible loading in a room. Describe the applicant's program to control the fire hazard presented by paper or other combustible materials, as well as potential ignition sources in these rooms.

Dominion Response

The FSAR incorporates by reference DCD Section 9.5.1. The control of combustible materials and ignition sources is addressed in DCD Section 9.5.1.15.6, "Control of Combustible Materials, Hazardous Materials and Ignition Sources." This section requires that administrative procedures control combustible materials by imposing the following controls:

- Govern the use of ignition sources by use of a flame permit system to control welding, flame cutting, grinding, brazing and soldering operations, and temporary electrical power cables. A separate permit is issued for each area where such work is done. If work continues over more than one shift, the permit is valid for not more than 24 hours when the plant is operating or for the duration of a particular job during plant shutdown per NFPA 51B and 241;
- Minimize waste, debris, scrap, and oil spills or other combustibles resulting from a work activity in the power block while work is in progress and remove the same upon completion of the activity or at the end of each work shift;
- Govern periodic inspections for accumulation of combustibles and to ensure continued compliance with these administrative controls; and
- Control the use of specific combustibles in the powerblock. All wood used in the power block during maintenance, modification, or refueling operation (such as lay-down blocks or scaffolding) is treated with a flame retardant. Equipment or supplies (such as new fuel) shipped in untreated combustible packing containers may be unpacked in the power block if required for valid operating reasons. However, all combustible materials

are removed from the area immediately following unpacking. Such transient combustible material, unless stored in approved containers, is not left unattended in the powerblock during lunch breaks, shift changes, or other similar periods. Loose combustible packing material such as wood or paper excelsior, or polyethylene sheeting is placed in metal containers with tight-fitting self-closing metal covers. Only noncombustible panels or flame-retardant tarpaulins or approved materials of equivalent fire-retardant characteristics are used in the powerblock. Any other fabrics or plastic films used in the powerblock are certified to conform to the large-scale fire test described in NFPA 701.

In addition to the administrative controls described above, the FSAR will be revised to include administrative requirements that specifically control combustible materials and potential ignition sources in computer rooms that are not part of the control room complex.

Proposed COLA Revision

FSAR Section 9.5.1.15.6 will be revised to add the following requirements.

- In rooms adjacent to the main control room and in computer rooms that are not part of the control room complex:
  - Transient combustible materials are not left unattended during lunch breaks, shift changes, or other similar periods unless stored in approved containers.
  - Electrical appliances and other potential ignition sources are controlled.

These changes are shown on the attached FSAR 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 ESBWR 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.

operational prior to receipt for new fuel. Other required elements of the Fire Protection Program described in this section are fully operational prior to initial fuel loading per Section 13.4.

9.5.1.15.1 **Fire Protection Program Criteria**

Add the following at the end of this section.

NAPS SUP 9.5.1-1 Table 9.5-201 supplements DCD Table 9.5-1.

9.5.1.15.2 ~~**Organization and Responsibilities**~~ **[Deleted]**

~~Replace the last sentence of the thirteenth bullet as follows.~~

~~**STD COL 9.5.1-9-A**~~ ~~Control of changes to the fire protection program is defined in a license condition. Changes to the approved fire protection program may be made without prior approval of the NRC only if these changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.~~

9.5.1.15.4 **Onsite Fire Operations Training**

Replace the first paragraph with the following.

NAPS COL 9.5.1-10-H Implementation of the fire brigade will be in accordance with the milestones in Section 13.4 for the Fire Protection Program.

9.5.1.15.6 **Control of Combustible Material; Hazardous Materials and Ignition Sources**

Add the following at the end of this section.

STD SUP 9.5.1-3

- In rooms adjacent to the main control room and in computer rooms that are not part of the control room complex:
  - Transient combustible materials are not left unattended during lunch breaks, shift changes, or other similar periods unless stored in approved containers.
  - Electrical appliances and other potential ignition sources are controlled.
- Prohibit the storage of transient combustibles below the raised floor in the main control complex.

ENCLOSURE 8

Response to NRC RAI Letter No. 008

RAI Question No. 09.05.01-8

NRC RAI 09.05.01-8

RG 1.206, Regulatory Position C.III.1, Section C.I.9.5.1.1 identifies that the COL applicant should provide site specific information on the fire water supply system. COLA Section 9.1.5.4 identifies Lake Anna as the secondary firewater source. RG 1.189 states that fire water supplies should be filtered and treated as necessary to prevent or control biofouling or microbiologically induced corrosion of fire water systems. The Applicant should describe the program to monitor and maintain an acceptable level of quality of their fire water sources.

Dominion Response

As discussed in FSAR Section 9.5.1, water for the Fire Protection System is supplied from a minimum of two sources: i) at least one "primary" source to the suctions of the primary fire pumps and corresponding jockey fire pumps and, ii) at least one "secondary" source to suctions of the secondary fire pumps and corresponding jockey fire pumps. The primary firewater source consists of two dedicated, Seismic Category I, firewater storage tanks. The secondary firewater source is Lake Anna.

Primary Firewater Source

The Pretreated Water Supply System (PWSS) provides treated and filtered water to the firewater storage tanks. PWSS pumps are located in the Station Water Intake Building. Hypochlorite is added to lake water in the Station Water Intake Building intake bay to preclude biofouling or microbiologically induced corrosion. Strainers are installed at the discharge of the PWSS pumps to preclude large-size foreign materials. The water is also preconditioned to facilitate filtering through multimedia filters before being stored in the station water storage tank and supplied to the firewater storage tanks.

Secondary Firewater Source

The secondary fire pumps are also located in the Station Water Intake Building and draw water from the intake bay. Hypochlorite is added to lake water in the Station Water Intake Building intake bay to preclude biofouling or microbiologically induced corrosion. Hypochlorite can be injected at the discharge of the secondary fire pumps, if required. Strainers are installed at the discharge of secondary firewater pumps to preclude large-size foreign materials. Filtering is not required because of the small amount of total suspended solids in the lake water.

Sampling and monitoring is performed, as required, to ensure an acceptable level of quality of firewater. Periodic system flushes and flow tests are performed to maintain and verify firewater supply system capability.

Proposed COLA Revision

FSAR Section 9.5.1.4 will be revised to describe the program to monitor and maintain an acceptable level of quality of firewater sources. This change is shown on the attached FSAR 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 ESBWR 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.

9.5.1.2 **System Description**

Add the following after the first sentence in the first paragraph.

NAPS COL 9.5.1-4-A

Figures 9.5-201, 9.5-202, and 9.5-203 provide simplified diagrams of the site-specific firewater supply piping.

9.5.1.4 **Fire Protection Water Supply System**

Water Sources

Replace the first paragraph with the following.

NAPS COL 9.5.1-4-A

As identified by DCD Figure 9.5-1 and Figures 9.5-201, 9.5-202, and 9.5-203, water for the Fire Protection System is supplied from a minimum of two sources: i) at least one "primary" source to the suctions of primary fire pumps and corresponding jockey fire pumps and, ii) at least one "secondary" source to suctions of secondary fire pumps and corresponding jockey fire pumps. The primary source is two dedicated, Seismic Category I, firewater storage tanks. Each primary firewater storage tank has sufficient capacity to meet the maximum firewater demand of the system for a period of 120 minutes.

NAPS COL 9.5.1-1-A

The secondary firewater source is Lake Anna. This large body of water has a capacity well in excess of the 1136 m^3 (300,000 gal) required by NFPA 804.

The water from Lake Anna is treated with sodium hypochlorite.

Primary Firewater Source

The Pretreated Water Supply System (PWSS) provides treated and filtered water to the firewater storage tanks. PWSS pumps are located in the Station Water Intake Building. Hypochlorite is added to lake water in the Station Water Intake Building intake bay to preclude biofouling or microbiologically induced corrosion. Strainers are installed at the discharge of the PWSS pumps to preclude large-size foreign materials. The water is also preconditioned to facilitate filtering through multimedia filters before being stored in the station water storage tank and supplied to the firewater storage tanks.

Secondary Firewater Source

The secondary fire pumps are also located in the Station Water Intake Building and draw water from the intake bay. Hypochlorite is added to lake water in the Station Water Intake Building intake bay to preclude biofouling or microbiologically induced corrosion. Hypochlorite can be injected at the discharge of the secondary fire pumps, if required. Strainers are installed at the discharge of secondary firewater pumps to preclude large-size foreign materials. Filtering is not required because of the small amount of total suspended solids in the lake water.

Sampling and monitoring is performed, as required, to ensure an acceptable level of quality of firewater. Periodic system flushes and flow tests are performed to maintain and verify firewater supply system capability.

Water sources that are used for multiple purposes ensure that the required quantity of firewater is dedicated for fire protection use only.

Fire Pumps

Replace the sixth sentence in the first paragraph with the following.

STD COL 9.5.1-2-A

Testing will be performed to demonstrate that the secondary fire protection pump circuit supplies a minimum of 484 m^3/hr (2130 gpm) with sufficient discharge pressure to develop a minimum of 107 psig line pressure at the Turbine Building/yard interface boundary. This cannot be performed until the system is built. This activity will be completed prior to fuel receipt.

9.5.1.5 **Firewater Supply Piping, Yard Piping, and Yard Hydrants**

Delete the last paragraph and add the following at the end the first paragraph.

NAPS COL 9.5.1-4-A

Figures 9.5-201, 9.5-202, and 9.5-203 provide simplified diagrams of the site-specific firewater supply piping.

9.5.1.10 **Fire Barriers**

Replace the last paragraph with the following.

STD COL 9.5.1-5-A

Mechanical and electrical penetration seals and electrical raceway fire barrier systems are qualified to the requirements delineated in RG 1.189

ENCLOSURE 9

Response to NRC RAI Letter No. 008

RAI Question No. 09.05.01-9

NRC RAI 09.05.01-9

North Anna COLA Table 9.5-201 added NFPA 55 for COLA applicability. Table 1.9-204 does not contain NFPA 55. The applicant should verify if Table 1.9-204 is missing NFPA 55 since it was added by Table 9.5-201 and make changes accordingly.

Dominion Response

NFPA 55, "Standard for the Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks," is appropriately referenced in FSAR Table 9.5-201, Codes and Standards.

As stated in FSAR Section 1.9.2, "Table 1.9-204 identifies the Industrial Codes and Standards that are applicable to those portions of the Unit 3 design that are beyond the scope of the DCD or the SSAR, and to the operational aspects of the facility."

Because NFPA 55 is applicable to the yard areas and other portions of the design that are beyond the scope of the DCD or SSAR, Dominion agrees that FSAR Table 1.9-204 should reference NFPA 55.

Proposed COLA Revision

FSAR Table 1.9-204 will be revised to add a reference to NFPA 55. This change is shown on the attached FSAR 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 ESBWR 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.

Table 1.9-204 Industrial Codes and Standards

Code or Standard Number	Year	Title
Institute of Electrical and Electronics Engineers (IEEE)		
C2	2007	National Electric Safety Code
C57.19.100-1995 (R2003)	2004	IEEE Guide for Application of Power Apparatus Bushings
National Fire Protection Association (NFPA)		
NFPA 10	2007	Standard for Portable Fire Extinguishers
NFPA 11	2005	Standard for Low-, Medium-, and High-Expansion Foam Systems
NFPA 13	2007	Standard for the Installation of Sprinkler Systems
NFPA 14	2007	Standard for the Installation of Sandpipe and Hose Systems
NFPA 15	2007	Standard for Water Spray Fixed Systems for Fire Protection
NFPA 16	2007	Standard for the Installation of Foam-Water Sprinkler and Foam-Water Spray Systems
NFPA 20	2007	Standard for the Installation of Stationary Pumps for Fire Protection
NFPA 24	2007	Standard for the Installation of Private Fire Service Mains and their Appurtenances
NFPA 25	2008	Recommended Practices for Inspection, Testing, and Maintenance of Standpipes and Hose Systems
NFPA 30	2008	Flammable and Combustible Liquids Code
NFPA 37	2006	Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines
NFPA 55	2005	Standard for the Storage, Use, and Handling of Compressed Gases and Cryogenic Fluids in Portable and Stationary Containers, Cylinders, and Tanks
NFPA 70	2008	National Electric Code

ENCLOSURE 10

Response to NRC RAI Letter No. 008

RAI Question No. 09.05.01-10

NRC RAI 09.05.01-10

RG 1.206, Regulatory Position C.III.1, Section C.I.9.5.1.1 identifies that the COL applicant should provide information on the fire protection operational program including information on the fire brigade and procedures. RG 1.189 states that the communication system design should provide effective communication between plant personnel in all vital areas during fire conditions under maximum potential noise levels. The staff requests that the COL applicant describe its programmatic procedures and/or controls to ensure that a fire in any one fire area that disables a communication system or systems such as a loss of a repeater that creates a communication dead spot does not preclude the capability to provide or ensure communications in those areas of the plant such that safe shutdown capability is not adversely impacted.

Dominion Response

Vital areas required for safe shutdown capability are within the scope of the standard plant design described in the DCD. FSAR Section 9.5.2 incorporates by reference the DCD, which describes the design of the communication system and its capability to provide or ensure communications in those areas of the plant such that safe shutdown capability is not adversely impacted. The pertinent DCD sections are summarized in the following paragraphs.

DCD Section 9.5.2 states that the "communication system provides the means to conveniently and effectively communicate between various plant locations and with offsite locations during normal, maintenance, transient, fire, and accident conditions under maximum potential noise levels." Section 9.5.2.1 states that the communication subsystems "are independent of one another, therefore, a failure in one subsystem does not degrade the performance of the other subsystems." Section 9.5.2.2 further describes the system:

> "The PA/PL, PABX, and plant radio systems are physically independent systems powered from diverse nonsafety-related power supplies backed from the standby onsite AC power supply system. They serve as backup to one another in the event of system failures. These three independent voice communication systems are designed and installed to provide assurance that any single event does not cause a complete loss of intraplant communication. This is accomplished by the use of diverse technology, separate routing of cables, and separate standby diesel-generator-backed power supplies."

DCD Section 9.5.2.3 states that the "failure of any communications system does not adversely affect safe shutdown capability."

As described in DCD Section 9.5.2.4, these communication systems are tested periodically to ensure their continued functionality.

In summary, the design of the ESBWR plant communications system, as described in DCD Section 9.5.2, ensures an effective means for personnel to communicate during fire conditions.

Proposed COLA Revision

None.

ENCLOSURE 11

Response to NRC RAI Letter No. 008

RAI Question No. 09.05.01-11

NRC RAI 09.05.01-11

QA Program: RG 1.206, Regulatory Position C.III.1, Section C.I.9.5.1.1 identifies that the COL applicant should provide information on the fire protection operational program and procedures. RG 1.189 states that there are two options either include the FP program in the plant's overall QA program or provide a description of the FP QA program. The North Anna 3 COLA FSAR incorporates by reference Chapter 17 for fire protection systems for safety related areas while it also states that the QA program implements the requirements of RG 1.189 through site-specific administrative controls procedures. The applicant should specifically identify if non-safety related areas will have a QA FP program different than that described in Chapter 17. If so, then the applicant should provide a description of the fire protection QA program that is applicable to the non-safety related areas.

Dominion Response

FSAR Section 9.5.1.15.9 incorporates by reference the DCD, which states that "quality assurance controls are applied to the activities involved in the design, procurement, installation, and testing and the administrative controls of fire protection systems for safety-related areas, in accordance with the programs outlined in Chapter 17."

In addition to safety-related areas, quality assurance controls will be applied to fire protection for nonsafety-related areas, consistent with FSAR Appendix 17BB. This includes areas with nonsafety-related systems/components that are significant contributors to plant safety.

The FSAR will be revised to include nonsafety-related areas within the scope of the fire protection quality assurance controls outlined in Chapter 17.

Proposed COLA Revision

FSAR Section 9.5.1.15.9 will be revised to state:

"Quality assurance controls are applied to the activities involved in the design, procurement, installation, and testing and the administrative controls of fire protection systems, in accordance with the measures outlined in Chapter 17."

This change is shown on the attached FSAR 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 ESBWR 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.

- Prohibit the storage of hazardous chemicals in areas that contain or expose equipment important to safety.

9.5.1.15.9 **Quality Assurance**

Replace ~~the last sentence~~ this section with the following.

STD COL-9.5.1-11-A

~~The Quality Assurance Program implements the requirements of RG 1.189 through site specific administrative controls procedures. The procedures will be developed six months prior to fuel receipt and will be fully implemented prior to fuel receipt.~~

Quality assurance controls are applied to the activities involved in the design, procurement, installation, and testing and the administrative controls of fire protection systems, in accordance with the measures outlined in Chapter 17.

For the operational fire protection program, the Quality Assurance Program implements the requirements of RG 1.189 through site-specific administrative controls procedures. The procedures will be developed six months prior to fuel receipt and will be fully implemented prior to fuel receipt.

9.5.1.16 **COL Information**

9.5.1-1-A **Secondary Firewater Storage Source**

NAPS COL 9.5.1-1-A This COL item is addressed in Section 9.5.1.4 and DCD Table 9.5-2.

9.5.1-2-A **Secondary Firewater Capacity**

NAPS COL 9.5.1-2-A This COL item is addressed in Section 9.5.1.4.

9.5.1-4-A **Piping and Instrument Diagrams**

NAPS COL 9.5.1-4-A This COL item is addressed in Sections 9.5.1.2, 9.5.1.4, 9.5.1.5, and Figures 9.5-201, 9.5-202, and 9.5-203.

9.5.1-5-A **Fire Barriers**

STD COL 9.5.1-5-A This COL item is addressed in Section 9.5.1.10.

9.5.1-6-H **Smoke Control**

STD COL 9.5.1-6-H This COL item is addressed in Section 9.5.1.11.

9.5.1-7-H **FHA Compliance Review**

STD COL 9.5.1-7-H This COL item is addressed in Section 9.5.1.12.

ENCLOSURE 12

Response to NRC RAI Letter No. 008

RAI Question No. 09.05.01-12

NRC RAI 09.05.01-12

RG 1.206, Regulatory Position C.III.1, Section C.I.9.5.1.1 identifies that the COL applicant should provide information on the fire protection operational program. RG 1.189, Section 1.6.4.1 states that the brigade leader should be competent to assess the potential safety consequences of a fire and advise control room personnel and such competence by the brigade leader may be evidenced by possession of an operator's license or equivalent knowledge of plant systems. The staff requests that the COL applicant provide clarification of the specific training, knowledge and competence of the fire brigade leader, as discussed in Section 13.1.2.1.5, to ensure that the fire brigade leaders qualifications are in conformance with RG 1.189, Section 1.6.4.1.

Dominion Response

The intent of FSAR Revision 0 was to include detailed information about the fire brigade leader's training, knowledge and competence in the Fire Protection Program in accordance with the milestone included in FSAR Table 13.4-201, "Operational Programs Required by NRC Regulations." However, to facilitate the staff's review of the COLA, a summary of the fire brigade leader's training, knowledge and competence, consistent with the recommendations of RG 1.189, Revision 1, Regulatory Position 1.6.4.1, and with DCD Revision 5, Section 9.5.1.15.4.2, is provided below.

The fire brigade leader will have sufficient training in, or knowledge of, plant systems to understand the effects of fire and fire suppressants on safe-shutdown capability. The fire brigade leader will have the training or experience necessary to assess the potential safety consequences of a fire and advise control room personnel, as evidenced by possession of an operator's license, or equivalent knowledge of plant systems. The qualification of a fire brigade leader will include an annual physical examination to determine the individual's ability to perform strenuous firefighting activities.

Dominion will also require at least two fire brigade members to meet the training and knowledge requirements of the fire brigade leader. In addition, all fire brigade members will be subject to the annual physical examination requirement that is applicable to the fire brigade leader.

Proposed COLA Revision

FSAR Section 13.1.2.1.5 will be revised to specifically address the training, knowledge, and competence requirements for the fire brigade leader and members. This change is shown on the attached FSAR 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 ESBWR 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.

- An SRO shall be present at the facility or readily available on call at all times during its operation, and shall be present at the facility during initial start-up and approach to power, recovery from an unplanned or unscheduled shut-down or significant reduction in power, and refueling, or as otherwise prescribed in the facility license
- Minimum shift staffing for operations personnel is shown in Table 13.1-202
- With the unit in modes other than cold shutdown or refueling, there shall be one SRO in the control room at all times. In addition, there shall be one RO or one SRO at the controls whenever there is fuel in the reactor vessel

13.1.2.1.4 Operating Shift Crews

Plant administrative procedures implement the required shift staffing. These provisions establish crews with sufficient qualified plant personnel to staff the operational shifts and be readily available in the event of an abnormal or emergency situation. The objective is to operate the plant with the required staff and to develop work schedules that minimize overtime for plant staff members who perform safety-related functions. Work hour limitations and shift manning requirements defined by TMI Action Plan I.A.1.3 are addressed in station procedures. Shift crew staffing plans may be modified during refueling outages to accommodate safe and efficient completion of outage work in accordance with work hour limitations established in administrative procedures.

The minimum composition of an operating shift depends on the operational mode, as shown in Table 13.1-202. Reporting relationships for these positions are shown in Figure 13.1-203.

NAPS COL 9.5.1-10-H

13.1.2.1.5 Fire Brigade

The plant is designed, and the fire brigade organized, to be self-sufficient with respect to fire fighting activities. The fire brigade is organized to deal with fires and related emergencies that could occur. It consists of a fire brigade leader and a sufficient number of team members to be consistent with the equipment that must be put in service during a fire emergency. A sufficient number of trained and physically qualified fire brigade members are available on site during each shift. The fire brigade consists of at least five members on each shift. Members of the fire brigade are knowledgeable of building layout and system design. The assigned fire brigade members for any shift do not include the operations shift

manager nor any other members of the minimum shift operating crew necessary for safe shutdown of the unit, nor do they include any other personnel required for other essential functions during a fire emergency. Fire brigade members for a shift are designated in accordance with established procedures at the beginning of the shift. The fire brigade for Unit 3 does not include personnel assigned to Units 1 and 2.

The brigade leader and at least two brigade members have sufficient training in, or knowledge of, plant systems to understand the effects of fire and fire suppressents on safe-shutdown capability. The brigade leader has training or experience necessary to assess the potential safety consequences of a fire and advise control room personnel, as evidenced by possession of an operator's license or equivalent knowledge of plant systems. The qualification of fire brigade members includes an annual physical examination to determine their ability to perform strenuous firefighting activities.

13.1.3 **Qualification Requirements of Nuclear Plant Personnel**

13.1.3.1 **Minimum Qualification Requirements**

Qualifications of managers, supervisors, operators, and technicians of the operating organization meet the requirements for education and experience described in ANSI/ANS-3.1 (Reference 13.1-201), as endorsed and amended by RG 1.8. For operators and SROs, these requirements are modified in Section 13.2.

13.1.3.2 **Qualification Documentation**

Resumes and other documentation of qualification and experience of initial appointees to appropriate management and supervisory positions are available for review by regulators upon request after position vacancies are filled.

13.1.4 **COL Information**

13.1-1-A **Organizational Structure**

NAPS COL 13.1-1-A This COL item is addressed in Sections 13.1.1 through 13.1.3.

13.1.2 **References**

13.1-201 American Nuclear Society, "American National Standard for Selection, Qualification, and Training of Personnel for Nuclear Power Plant," ANSI/ANS -3.1.

ENCLOSURE 13

Response to NRC RAI Letter No. 008

RAI Question No. 09.05.01-13

NRC RAI 09.05.01-13

Storage of Hazmat Chemicals: RG 1.206, Regulatory Position C.III.1, Section C.I.9.5.1.1 identifies that the COL applicant should provide information on the fire protection operational program and procedures. RG 1.189 Position 2.1.1.b states hazmat chemicals should not be stored in safety-related areas. By referencing the ESBWR DCD, the COL applicant must adhere to the provisions for control of combustible materials, hazardous materials, and ignition sources as specified in ESBWR DCD Section 9.5.1.15.6. These provisions include administrative controls that govern the use and storage of hazardous chemicals in the powerblock. The staff requests that the COL applicant provide a description of its administrative controls governing the use and storage of hazardous chemicals in the powerblock and to provide a discussion that demonstrates these controls are in conformance with Position 2.1.1.b of RG 1.189.

Dominion Response

FSAR Section 9.5.1 incorporates by reference DCD Section 9.5.1.15.6, "Control of Combustible Materials, Hazardous Materials and Ignition Sources," which describes the administrative procedural controls imposed, including: "Govern the use and storage of hazardous chemicals in the powerblock." While this procedural control addresses RG 1.189, Position 2.1.1.b in a broad sense, it does not specifically prohibit the storage of hazardous chemicals in areas that contain or expose equipment important to safety.

The FSAR will be revised to include an additional administrative requirement to specifically address RG 1.189, Position 2.1.1.b, which states: "Hazardous chemicals should not be stored in areas that contain or expose equipment important to safety."

Proposed COLA Revision

FSAR Section 9.5.1.15.6 will be revised to add the following requirement:

- Prohibit the storage of hazardous chemicals in areas that contain or expose equipment important to safety.

This change is shown on the attached FSAR 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 ESBWR 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.

operational prior to receipt for new fuel. Other required elements of the Fire Protection Program described in this section are fully operational prior to initial fuel loading per Section 13.4.

9.5.1.15.1 **Fire Protection Program Criteria**

Add the following at the end of this section.

NAPS SUP 9.5.1-1

Table 9.5-201 supplements DCD Table 9.5-1.

9.5.1.15.2 ~~**Organization and Responsibilities**~~ **[Deleted]**

~~Replace the last sentence of the thirteenth bullet as follows.~~

~~**STD COL 9.5.1-9-A**~~

~~Control of changes to the fire protection program is defined in a license condition. Changes to the approved fire protection program may be made without prior approval of the NRC only if these changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.~~

9.5.1.15.4 **Onsite Fire Operations Training**

Replace the first paragraph with the following.

NAPS COL 9.5.1-10-H

Implementation of the fire brigade will be in accordance with the milestones in Section 13.4 for the Fire Protection Program.

9.5.1.15.6 **Control of Combustible Material; Hazardous Materials and Ignition Sources**

Add the following at the end of this section.

STD SUP 9.5.1-3

- In rooms adjacent to the main control room and in computer rooms that are not part of the control room complex:
  - Transient combustible materials are not left unattended during lunch breaks, shift changes, or other similar periods unless stored in approved containers.
  - Electrical appliances and other potential ignition sources are controlled.
- Prohibit the storage of transient combustibles below the raised floor in the main control complex.

- Prohibit the storage of hazardous chemicals in areas that contain or expose equipment important to safety.

9.5.1.15.9 **Quality Assurance**

Replace ~~the last sentence~~ this section with the following.

STD COL-9.5.1-11-A

~~The Quality Assurance Program implements the requirements of RG 1.189 through site-specific administrative controls procedures. The procedures will be developed six months prior to fuel receipt and will be fully implemented prior to fuel receipt.~~

Quality assurance controls are applied to the activities involved in the design, procurement, installation, and testing and administrative controls of fire protection systems, in accordance with the measures outlined in Chapter 17.

For the operational fire protection program, the Quality Assurance Program implements the requirements of RG 1.189 through site-specific administrative controls procedures. The procedures will be developed six months prior to fuel receipt and will be fully implemented prior to fuel receipt.

9.5.1.16 **COL Information**

9.5.1-1-A **Secondary Firewater Storage Source**

NAPS COL 9.5.1-1-A This COL item is addressed in Section 9.5.1.4 and DCD Table 9.5-2.

9.5.1-2-A **Secondary Firewater Capacity**

NAPS COL 9.5.1-2-A This COL item is addressed in Section 9.5.1.4.

9.5.1-4-A **Piping and Instrument Diagrams**

NAPS COL 9.5.1-4-A This COL item is addressed in Sections 9.5.1.2, 9.5.1.4, 9.5.1.5, and Figures 9.5-201, 9.5-202, and 9.5-203.

9.5.1-5-A **Fire Barriers**

STD COL 9.5.1-5-A This COL item is addressed in Section 9.5.1.10.

9.5.1-6-H **Smoke Control**

STD COL 9.5.1-6-H This COL item is addressed in Section 9.5.1.11.

9.5.1-7-H **FHA Compliance Review**

STD COL 9.5.1-7-H This COL item is addressed in Section 9.5.1.12.

ENCLOSURE 14

Response to NRC RAI Letter No. 008

RAI Question No. 09.05.01-14

NRC RAI 09.05.01-14

Storage of unused ion exchange resins: RG 1.206, Regulatory Position C.III.1, Section C.I.9.5.1.1 identifies that the COL applicant should provide information on the fire protection operational program and procedures. RG 1.189 Position 2.1.1.a states that unused ion exchange resins should not be stored in areas that contain or expose safety-related equipment. By referencing the ESBWR DCD, the COL applicant must adhere to the provisions for control of combustible materials, hazardous materials, and ignition sources as specified in ESBWR DCD Section 9.5.1.15.6. These provisions include administrative controls that prohibit the storage of combustible materials (including unused ion exchange resins) in areas that contain or expose safety related equipment or establish designated storage areas with appropriate fire protection. The staff requests that the COL applicant provide a description of its administrative controls that either prohibit the storage of unused ion exchange resins in specific plant areas or that describes a methodology or process for designating appropriate storage areas and for determining appropriate fire protection requirements.

Dominion Response

FSAR Section 9.5.1 incorporates by reference DCD Section 9.5.1.15.6, which describes the administrative procedural requirements for controlling combustible materials, hazardous materials, and ignition sources. The first bullet of DCD Section 9.5.1.15.6, Revision 5, imposes the procedural control to "prohibit the storage of combustible materials (including unused ion exchange resins) in areas that contain or expose safe shutdown equipment or establish designated storage areas with appropriate fire protection."

Details regarding how this administrative control will be implemented are procedure-level information that has not yet been developed. Fire protection procedures will be developed in accordance with FSAR Section 13.5.

Proposed COLA Revision

None.

ENCLOSURE 15

Response to NRC RAI Letter No. 008

RAI Question No. 09.05.01-15

NRC RAI 09.05.01-15

Fire Barrier Testing Laboratories: RG 1.206, Regulatory Position C.III.1, Section C.I.9.5.1.1 identifies that the COL applicant should provide information on fire barrier and fire barrier penetration seal systems qualification test methodology and reports. RG 1.189 Position 4.2, 4.3, and Appendix C gives qualification criteria and test methods for fire barriers. RG 1.189 Glossary defines approved as tested and accepted for a specific purpose or application by a recognized testing laboratory or reviewed and specifically approved by the NRC in accordance with the appropriate regulatory process. Therefore, in order to be in accordance with RG 1.189 fire barrier approval necessitates the use of a recognized testing laboratory. North Anna 3 COLA Section 9.5.1.10 states that fire barriers are qualified to the requirements of RG 1.189 and that an independent testing laboratory will be used. The applicant should clarify if they intend to use a "recognized" testing laboratory in accordance with RG 1.189 or whether the independent testing laboratory, as stated in the application, is "recognized".

Dominion Response

The FSAR will be revised to specify the use of a "recognized" testing laboratory in accordance with RG 1.189.

Proposed COLA Revision

FSAR 9.5.1.10 will be revised to state that mechanical and electrical penetration seals and electrical raceway fire barrier systems are qualified to the requirements delineated in RG 1.189 by a recognized testing laboratory.

This change is shown on the attached FSAR 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 ESBWR 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.

Secondary Firewater Source

The secondary fire pumps are also located in the Station Water Intake Building and draw water from the intake bay. Hypochlorite is added to lake water in the Station Water Intake Building intake bay to preclude biofouling or microbiologically induced corrosion. Hypochlorite can be injected at the discharge of the secondary fire pumps, if required. Strainers are installed at the discharge of secondary firewater pumps to preclude large-size foreign materials. Filtering is not required because of the small amount of total suspended solids in the lake water.

Sampling and monitoring is performed, as required, to ensure an acceptable level of quality of firewater. Periodic system flushes and flow tests are performed to maintain and verify firewater supply system capability.

Water sources that are used for multiple purposes ensure that the required quantity of firewater is dedicated for fire protection use only.

Fire Pumps

Replace the sixth sentence in the first paragraph with the following.

STD COL 9.5.1-2-A

Testing will be performed to demonstrate that the secondary fire protection pump circuit supplies a minimum of 484 m^3/hr (2130 gpm) with sufficient discharge pressure to develop a minimum of 107 psig line pressure at the Turbine Building/yard interface boundary. This cannot be performed until the system is built. This activity will be completed prior to fuel receipt.

9.5.1.5 **Firewater Supply Piping, Yard Piping, and Yard Hydrants**

Delete the last paragraph and add the following at the end the first paragraph.

NAPS COL 9.5.1-4-A

Figures 9.5-201, 9.5-202, and 9.5-203 provide simplified diagrams of the site-specific firewater supply piping.

9.5.1.10 **Fire Barriers**

Replace the last paragraph with the following.

STD COL 9.5.1-5-A

Mechanical and electrical penetration seals and electrical raceway fire barrier systems are qualified to the requirements delineated in RG 1.189

by ~~an independent~~ a recognized testing laboratory in accordance with the applicable guidance of NFPA 251 and/or ASTM E-119. Detailed design in this area is not complete. Specific design and certification test results for penetration seal designs and electrical raceway fire barrier systems will be available for review at least six months prior to fuel receipt.

9.5.1.11 **Building Ventilation**

Replace the last sentence in the third paragraph with the following.

STD COL 9.5.1-6-H

Procedures for manual smoke control will be developed as part of the Fire Protection Program implementation. The required elements of the Fire Protection Program are fully operational prior to receipt of new fuel for buildings storing new fuel and adjacent fire areas that could affect the fuel storage area. Other required elements of the Fire Protection Program described in this section are fully operational prior to initial fuel loading per Section 13.4.

9.5.1.12 **Safety Evaluation**

Replace the fifth paragraph with the following.

STD COL 9.5.1-7-H

A compliance review of the as-built design against the assumptions and requirements stated in the FHA will be completed in accordance with the milestones in Section 13.4.

Add the following after the fifth paragraph.

STD SUP 9.5.1-2

An as-built review of final post-fire safe-shutdown analysis will be performed based on final plant cable routing and equipment arrangement. This review will include verification that purchased components required for post-fire safe shutdown are not impacted by indirect effects of fire such as smoke migration from one fire area to another. This activity will be completed in accordance with the milestones in Section 13.4.

9.5.1.15 **Fire Protection Program**

Replace the last sentence of the first paragraph with the following.

STD COL 9.5.1-8-A

The elements of the Fire Protection Program necessary to support receipt and storage of fuel onsite for buildings storing new fuel and adjacent fire areas that could affect the fuel storage area are fully