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Dominion®

May 6, 2011

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

Serial No. NA3-11-020R
Docket No. 52-017
COL/DWL

DOMINION VIRGINIA POWER
NORTH ANNA UNIT 3 COMBINED LICENSE APPLICATION
SRP 09.01.05, 09.02.02, AND 09.02.04: RESPONSE TO RAI LETTER 65

On April 14, 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 three of the five Request for Additional Information (RAI) Questions are provided in Enclosures 1 through 3:

- RAI 5476, Question 09.01.05-3 Heavy Loads Handling Program
- RAI 5578, Question 09.02.02-1 Degasifier Impact on CCCW Evaluation
- RAI 5404, Question 09.02.04-1 Sanitary Drain Contamination

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

The responses to the other two questions, RAI 5554, Question 09.02.01-14 and RAI 5548, Question 09.03.04-1, require additional technical evaluation and review time to prepare. The responses to these two questions will be provided by June 10, 2011.

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

Very truly yours,

Eugene S. Grecheck

D089
NRO

Enclosure:

1. Response to NRC RAI Letter No. 65, RAI 5476 Question 09.01.05-3
2. Response to NRC RAI Letter No. 65, RAI 5578 Question 09.02.02-1
3. Response to NRC RAI Letter No. 65, RAI 5404 Question 09.02.04-1

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 6th day of May, 2011
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

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

ENCLOSURE 1

Response to NRC RAI Letter 65

RAI 5476 Question 09.01.05-3

SUPPLEMENTAL RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION

North Anna Unit 3

Dominion

Docket No. 52-017

RAI NO.: 5476 (RAI Letter 65)

SRP SECTION: 09.01.05 – OVERHEAD HEAVY LOAD HANDLING SYSTEMS

QUESTIONS for Balance of Plant Branch 1(AP1000/EPR Projects (SBPA))

DATE OF RAI ISSUE: 04/14/2011

QUESTION NO.: 09.01.05-3

Regulatory Guide (RG) 1.206, "Combined License Applications for Nuclear Power Plants (LWR Edition)," Section C.I.9.1.5 states that the applicant should describe the program and schedule for implementation of the program governing heavy load handling, including several bulleted items (see below) as listed in the RG 1.206.

NUREG-0800, Standard Review Plan (SRP) Section 9.1.5, "Overhead Heavy Load Handling Systems," and Section 5.1.1 of NUREG-0612, "Control of Heavy Load at Nuclear Power Plants," also describe heavy load handling guidelines.

As a minimum, the COLA should describe the program and schedule for heavy load handling including the following:

- A listing of all heavy loads and heavy load handling equipment outside the scope of loads described in the referenced certified design and the associated heavy load attributes (load weight and typical load path)
- Heavy load handling safe load paths and routing plans including descriptions of automatic and manual interlocks and safety devices and procedures to assure safe load path compliance
- Heavy load handling equipment maintenance manuals and procedures
- Heavy load handling equipment inspection and test plans
- Heavy load handling personnel qualifications, training, and control programs
- Quality assurance (QA) programs to monitor, implement, and ensure compliance with the heavy load handling program

A heavy load handling program that meets Section 5.1.1 of NUREG- 612, SRP Section 9.1.5 and RG 1.206 Section C.I.9.1.5 should be in place before there is a possibility that a load drop could cause a release of radioactivity, a criticality accident, an inability to cool fuel within the reactor vessel or spent fuel pool, or prevent safe shutdown of the reactor.

Provide a description in the FSAR of the key elements of the heavy loads handling program at a level of detail similar to that of Section 5.1.1 of NUREG-0612, SRP Section 9.1.5, and RG 1.206. Include in the FSAR a description of the program areas that will be addressed by the procedures developed to cover load handling operations, a discussion on the establishment and use of safe load paths, programs or procedures for training and qualification of crane operator, programs or procedures for crane inspection testing and maintenance, and the heavy loads quality assurance program. In addition, provide a schedule as to when the procedures will be completed.

Dominion Response

North Anna Unit 3 RAI 5476 Question 09.01.05-3 is identical to Comanche Peak Units 3 and 4 R-COLA RAI ID 3294, CP RAI 52, Question 09.01.05-1. Dominion endorsed the response to the R-COLA RAI in letter NA3-10-019, dated November 10, 2010, (ML103160406) for the North Anna Unit 3 S-COLA. North Anna Unit 3 FSAR Section 9.1.5.3 incorporates the description of the heavy load handling program consistent with the FSAR mark-up provided in the response to R-COLA RAI Question 09.01.05-1. Therefore, no further changes are required for the S-COLA FSAR.

Proposed COLA Revision

None

ENCLOSURE 2

Response to NRC RAI Letter 65

RAI 5578 Question 09.02.02-1

SUPPLEMENTAL RESPONSE TO
REQUEST FOR ADDITIONAL INFORMATION

North Anna Unit 3

Dominion

Docket No. 52-017

RAI NO.: 5578 (RAI Letter 65)

SRP SECTION: 09.02.02 – REACTOR AUXILIARY COOLING WATER SYSTEMS

QUESTIONS for Balance of Plant Branch 1(AP1000/EPR Projects (SBPA))

DATE OF RAI ISSUE: 04/14/2011

QUESTION NO.: 09.02.02-1

Standard Review Plan (SRP) 9.2.2 Section III instructs the staff to confirm the overall arrangement of the component cooling system (CCWS).

In a request for information (RAI) 362-2278, Question 09.02.02-27 and later supplemental RAI 571-4365, Question 09.02.02-51, the staff asked the US–APWR DCD applicant to provide detailed system parameters for all operating modes and alignments. MHI provided the staff with a DCD markup (attachment 2), response dated 7/13/2010 for RAI 571-4365 which shows a Tier 1 figure with pressure, temperature and flow data for various plant conditions.

Since NAPS has departed from the US-APWR DCD with the removal of the boric acid evaporator and added the degasifier (CVS-MEQ-002), the staff request that the COL applicant confirm that the data provided in the DCD markup is still valid and accurate. That is, for node location A2-5, pressure is still 4.0 kg/cm2 (57 psig), temperature is still ~93.3 °C (200 °F) and flow rate is still 5633 liters/min (1488 gpm) (or 0 flow for accident conditions). If this data is different from the DCD, this should be reflected in the COL FSAR as required. If the flow rate changes, this may also affect other node locations such as A2-1 and A2-7.

In addition, the DCD (Figure 9.2.2-1 sheet 9 of 9) had throttle valves located downstream of the two concentrate pumps, condensate cooler, and condenser and vent condensers; however the NAPS design lacks throttle valves on Figure 9.2.2-1R (sheet 9 of 9). This information should be included in the COL FSAR.

Dominion Response

The US-APWR standard plant Component Cooling Water System (CCWS) design considers the heat load from the boric acid evaporator and the required flow for cooling the evaporator. The North Anna Unit 3 design does not include the boric acid evaporator and has replaced the evaporator with a degasifier system. The degasifier heat load and flow requirements fall within the standard plant CCWS design parameters for the boric acid evaporator. Therefore, the Unit 3 CCWS pressure, flow and heat load are bounded by the standard design values for the CCWS and there are no impacts to the CCWS due to the equipment change. That is, the pressure, temperature, and flow data provided in the US-APWR DCD for various plant conditions for a boric acid evaporator are accurate and valid for a degasifier. No FSAR change is necessary.

The throttle valves shown in DCD Figure 9.2.2-1, Sheet 9 of 9, for the boric acid evaporator are also necessary for the degasifier system. These valves will be provided as part of the vendor-supplied degasifier package. However, the configuration of a degasifier package may vary between vendors, and the throttle valves within the package may also vary. Therefore, the degasifier package, as presented in the FSAR Figure 9.2.2-1R, does not show the same level of detail regarding these throttle valves as the DCD Figure 9.2.2-1. For clarification, FSAR Section 9.2.2.1.2.1 will be revised to include the use of throttle valves as a means to control and balance the removal of heat from the components serviced by the CCWS.

Proposed COLA Revision

FSAR Section 9.2.2.1.2.1 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.

9.2.1.5.4 ESWP Motor Essential Service Water Flow

STD COL 9.2(7)**

Replace the content of DCD Subsection 9.2.1.5.4 with the following.

Not applicable.

9.2.2.1.2.1 Normal Operation

NAPS DEP 9.2(1)

Replace the third sentence in DCD Subsection 9.2.2.1.2.1 with the following.

Normal operating heat loads are reactor coolant pump, charging pump, letdown heat exchanger, instrument air, spent fuel pool cooling heat exchanger, sample heat exchanger, seal water heat exchanger, blowdown sample cooler, degasifier, waste gas compressor, and other smaller loads. Throttle valves are located throughout the system to maintain flow balance and adequate heat removal.

9.2.2.2.2 System Operations

STD COL 9.2(27)

Replace the last paragraph in DCD Subsection 9.2.2.2.2 with the following.

The operating and maintenance procedures regarding water hammer are included in system operating procedures in Section 13.5.2.1. A milestone schedule for implementation of the procedures is also included in Subsection 13.5.2.1.

9.2.4 Potable and Sanitary Water Systems

NAPS COL 9.2(9)
NAPS COL 9.2(13)

Replace the paragraph in DCD Subsection 9.2.4 with the following.

The objectives of the potable and sanitary water system (PSWS) are to provide clean and potable water for domestic use and human consumption and to collect sanitary waste for treatment, dilution, and discharge during normal plant operation and shutdown periods. The system serves the following buildings:

- Reactor Building
- Turbine Building
- Auxiliary Building
- Access Building

ENCLOSURE 3

Response to NRC RAI Letter 65

RAI 5404 Question 09.02.04-1

SUPPLEMENTAL RESPONSE TO
REQUEST FOR ADDITIONAL INFORMATION

North Anna Unit 3

Dominion

Docket No. 52-017

RAI NO.: 5404 (RAI Letter 65)

SRP SECTION: 09.02.04 – POTABLE AND SANITARY DRAIN SYSTEMS

QUESTIONS for Balance of Plant Branch 1(AP1000/EPR Projects (SBPA))

DATE OF RAI ISSUE: 04/14/2011

QUESTION NO.: 09.02.04-1

The North Anna 3 sanitary drain system as described in section 9.2.4 of the COL application, serves various plant buildings including the reactor building and the auxiliary building which include radiologically controlled areas of the plant. This is also shown on Figure 9.2.4-1R, "Potable and Sanitary Water System Flow Diagram (Sheet 2 of 2)." These drains, if included in the RCA, have the potential for unintentional contamination of sewage systems due to human factors related events, such as dumping a mop bucket down a sanitary drain.

If the sanitary system is installed in any area of the plant (Reactor Building, Auxiliary Building) that has piping that contains radioactive material, what are the provisions for preventing contamination of the sanitary system from valve or piping leaks from those systems. For instance, if the sanitary system is installed in the non-radiological portion of the Reactor Building, and there are pipes containing radioactive fluid passing through those areas, describe the provisions for preventing contamination of the sanitary system from valve or piping leaks from those contaminated systems.

Provide additional details in the COL application regarding prevention of the potential radiological contamination of sanitary drains in the RCA to confirm compliance with GDC 60.

Dominion Response

The North Anna Unit 3 sanitary drainage system does not serve any facilities in radiologically controlled areas. To be consistent with the US-APWR DCD, COLA FSAR Subsection 9.2.4.2.1 will be revised to include an opening paragraph summarizing the types of plant areas the Unit 3 sanitary drainage system serves and clarifying that radiologically controlled areas are not served so there is no potential for unintentional contamination of sewage systems due to human factors related events, such as dumping a mop bucket of contaminated liquid into a sanitary drain.

As stated in DCD Section 3.1.6.1.1, the US-APWR design complies with GDC 60. However, the final piping design, including the routing of fluid systems containing radioactive materials, has not yet been completed. If the sanitary drain system is installed in an area that has piping that contains radioactive material, and a radioactive leak occurs, standard operational health physics procedures would be used to isolate, control, and cleanup any contamination. These procedures prohibit any use of the sanitary drain system for disposal of contaminated liquids. Additionally, as described in FSAR Section 9.2.4.3, the sewage treatment plant (STP) includes a sludge tank which is grab sampled on a batch basis for detection of potential radiological contamination. In the event radioactivity is detected above predetermined limits, controls are in place to initiate treatment and prevent unmonitored, uncontrolled radioactive releases to the environment.

Proposed COLA Revision

FSAR Section 9.2.4.2.1 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.

(Reference 9.2.11-4). All state and local environmental protection standards are applied and followed, as these may be more stringent than federal requirements.

Replace the seventh bullet in DCD Subsection 9.2.4.1 with the following.

- The sanitary drainage system is designed to accommodate up to 1720 people at the site during normal plant operation as well as during refueling outages.

NAPS COL 9.2(12)
NAPS COL 9.2(17)

Replace the eighth bullet in DCD Subsection 9.2.4.1 with the following.

- Sanitary waste generated by Unit 3 facilities will be directed to individual sump lift stations via underground sanitary sewer lines and then pumped to the Unit 3 sewage treatment plant. Each lift station will be equipped with duplex grinder pumps.

9.2.4.2.1 General Description

NAPS COL 9.2(9)
NAPS COL 9.2(10)
NAPS COL 9.2(11)
NAPS COL 9.2(12)
NAPS COL 9.2(13)
NAPS COL 9.2(14)
NAPS COL 9.2(15)

Replace the content of DCD Subsection 9.2.4.2.1 with the following.

Potable Water System

The potable water system for Unit 3 consists of ground wells at various locations on site. As shown on Figure 9.2.4-1R, Sheet 1 of 2, for each well house there is a pump, compressor, hydro-pneumatic tank, and interconnecting piping and valves. Combined potable water capacity of the hydro-pneumatic tanks is sufficient to handle peak anticipated demand. Potable water from hydro-pneumatic tanks flows to a common potable water header for supply to Unit 3 facilities. The Unit 3 potable water system underground header is connected to the Units 1 and 2 domestic water header via a normally-closed isolation valve. This cross-tie connection is provided for operational flexibility and ease of system maintenance. In addition to non-radiological areas, potable water is provided to areas where inadvertent backflow into the system could result in radiological contamination of the potable water. For those potable water system branches with outlets in areas where the potential for radiological contamination exists, backflow prevention is provided through the installation of backflow preventers.

NAPS COL 9.2(16)
NAPS COL 9.2(17)

Sanitary Drainage System

The sanitary drainage system collects sanitary waste from various plant areas such as restrooms, locker rooms etc., and carries the wastewater for processing to the treatment facility. The sanitary drainage system does not serve any facilities in the radiologically controlled areas.

The sanitary waste generated by Unit 3 is collected by a network of sumps and is pumped to the Unit 3 Sewage Treatment Plant (STP). The Unit 3 STP consists of two packaged units, each rated for a normal capacity of 94,500 liters per day (25,000 gallons per day). The two packaged units in parallel can treat 189,000 liters per day (50,000 gallons per day) of sanitary sewage. During normal plant operation, only one of the packaged units is required, and during outages, both packaged units can be operated to serve additional demand. The effluent is discharged to the cooling tower blow down sump and subsequently drained to the WHTF.

Analysis of routine STP sludge tank grab samples will detect events that might contaminate the STP downstream of the sludge tank. This provides the action required by Inspection and Enforcement Bulletin No. 80-10. The quality of effluent meets, at a minimum, the standards established by Federal, state, and local regulations and permits. Sewage sludge is transferred to a truck for off-site disposal. A simplified diagram of the sanitary drainage system is shown in Figure 9.2.4-1R (Sheet 2 of 2). Major component data for the PSWS are provided in Table 9.2.4-1R.

9.2.4.2.2.1 **Potable Water Storage Tank**

STD COL 9.2(9)**
STD COL 9.2(15)**

Replace the content of DCD Subsection 9.2.4.2.2.1 with the following.

Not applicable.

9.2.4.2.2.2 **Potable Water Pumps**

STD COL 9.2(9)**
STD COL 9.2(15)**

Replace the content of DCD Subsection 9.2.4.2.2.2 with the following.

Not applicable.

9.2.4.2.2.3 **Jockey Pump**

STD COL 9.2(9)**
STD COL 9.2(15)**

Replace the content of DCD Subsection 9.2.4.2.2.3 with the following.

Not applicable.