

VIRGINIA ELECTRIC AND POWER COMPANY  
RICHMOND, VIRGINIA 23261

December 10, 2008

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

Serial No. 08-0670A  
NL&OS/ETS R0  
Docket Nos. 50-338/339  
50-280/281  
License Nos. NPF-4/7  
DPR-32/37

**VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)**  
**NORTH ANNA POWER STATION UNITS 1 AND 2**  
**SURRY POWER STATION UNITS 1 AND 2**  
**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION FOR**  
**PROPOSED LICENSE AMENDMENT REQUEST**  
**DELETION OF MAIN CONTROL ROOM/EMERGENCY SWITCHGEAR ROOM**  
**BOTTLED AIR SYSTEM FROM TECHNICAL SPECIFICATIONS**

In a letter dated March 19, 2008 (Serial No. 08-0080), Dominion requested amendments, in the form of changes to the Technical Specifications to Facility Operating License Numbers NPF-4 and NPF-7, for North Anna Power Station Units 1 and 2, respectively. The proposed amendment would delete the Control Room/Emergency Switchgear Room (MCR/ESGR) Bottled Air System from Technical Specifications. In an October 29, 2008 telephone conference call, the NRC staff requested additional information regarding adequacy of breathing air for the occupants in the MCR/ESGR envelope during the first hour of a Design Basis Accident (DBA). Dominion provided the additional information in a letter dated November 17, 2008 (Serial No. 08-0670). In a November 25, 2008 phone call to discuss the additional information, the NRC requested Dominion provide a quantitative assessment of the air quality in the MCR/ESGR during the first hour following MCR/ESGR envelope isolation.

As previously noted, removal of the bottled air system will have no adverse effects on the personnel in the MCR/ESGR envelope. A conservative estimate indicates that, with an airtight MCR/ESGR envelope and no bottled air available, MCR/ESGR environmental conditions at one hour after a DBA would remain within normal, expected ranges, specifically for carbon dioxide and oxygen concentration. To support this conclusion, a quantitative assessment of air quality in the MCR/ESGR envelope during the first hour of isolation is provided in the attachment to this letter.

Surry Power Station has requested a similar license amendment to delete the MCR/ESGR Bottled Air System from Technical Specifications in a letter dated October 9, 2008 (Serial No. 08-0411). Due to the similarity of design and operation of the Surry and North Anna MCR/ESGRs, the NRC's request for additional information is applicable to the Surry

license amendment request as well. Therefore, the information herein is provided as supplemental information on both the North Anna and Surry license amendment requests.

The information provided in this letter does not affect the conclusion of the significant hazards consideration discussion provided in Dominion letters dated March 19, 2008 (Serial No. 08-0080) and October 9, 2009 (Serial No. 08-0411) for North Anna and Surry, respectively.

If you have any questions or require additional information, please contact Mr. Thomas Shaub at (804) 273-2763.

Very truly yours,



J. Alan Price  
Vice President – Nuclear Engineering

Attachment

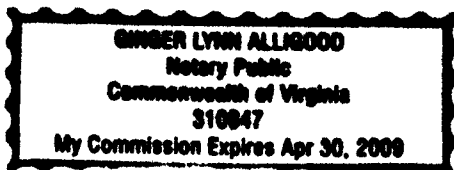
COMMONWEALTH OF VIRGINIA       )  
  )  
COUNTY OF HENRICO                )

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by J. Alan Price, who is Vice President – Nuclear Engineering, of Virginia Electric and Power Company. He has affirmed before me that he is duly authorized to execute and file the foregoing document in behalf of that Company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 10th day of December, 2008.

My Commission Expires: 4/30/2009

  
Notary Public



cc: U.S. Nuclear Regulatory Commission  
Region II  
Sam Nunn Atlanta Federal Center  
61 Forsyth Street, SW  
Suite 23T85  
Atlanta, Georgia 30303

Mr. J. E. Reasor, Jr.  
Old Dominion Electric Cooperative  
Innsbrook Corporate Center  
4201 Dominion Blvd.  
Suite 300  
Glen Allen, Virginia 23060

State Health Commissioner  
Virginia Department of Health  
James Madison Building - 7th floor  
109 Governor Street  
Suite 730  
Richmond, Virginia 23219

NRC Senior Resident Inspector  
North Anna Power Station

NRC Senior Resident Inspector  
Surry Power Station

Ms. D. N. Wright  
NRC Project Manager  
U. S. Nuclear Regulatory Commission  
One White Flint North  
Mail Stop O-8 H4A  
11555 Rockville Pike  
Rockville, Maryland 20852

Mr. J. F. Stang, Jr.  
NRC Project Manager  
U. S. Nuclear Regulatory Commission  
One White Flint North  
Mail Stop O-8 G9A  
11555 Rockville Pike  
Rockville, Maryland 20852

**ATTACHMENT**

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**Background**

In a letter dated March 19, 2008 (Serial No. 08-0080), Dominion requested amendments, in the form of changes to the Technical Specifications to Facility Operating License Numbers NPF-4 and NPF-7, for North Anna Power Station Units 1 and 2, respectively. The proposed amendment would delete the Main Control Room/Emergency Switchgear Room (MCR/ESGR) Bottled Air System from Technical Specifications. In an October 29, 2008 telephone conference call, the NRC staff requested additional information regarding adequacy of breathing air for the occupants in the MCR/ESGR envelope during the first hour of a Design Basis Accident (DBA). Dominion provided the additional information in a letter dated November 17, 2008 (Serial No. 08-0670). In a November 25, 2008 phone call to discuss the additional information, the NRC requested Dominion provide clarification of the additional information provided in that letter.

Surry Power Station has requested a similar license amendment to delete the MCR/ESGR Bottled Air System from Technical Specifications in a letter dated October 9, 2008 (Serial No. 08-0411). Due to the similarity of design and operation of the Surry and North Anna MCR/ESGRs, the NRC's request for additional information is applicable to the Surry license amendment request as well. Therefore, the information herein is provided as supplemental information on both the North Anna and Surry license amendment requests.

**NRC Request**

Provide additional quantitative evaluation of the quality of the air in the MCR/ESGR for the first hour during a Design Basis Accident with the MCR/ESGR envelope isolated with no fresh air supply. Ensure to reference the standards used to assess the air quality in the MCR/ESGR envelope.

**Dominion Response**

Although the following estimate was performed using Surry design information, the North Anna and Surry MCR/ESGRs are similar enough in design that the same conclusion applies to North Anna. Both Surry and North Anna each have a combined MCR on the upper level, with two ESGRs in the lower level. The doors and inlet/exhaust fans are very similar. The volume of the North Anna MCR and ESGRs is slightly larger, thus use of the Surry MCR volume is conservative. The effects of any leakage are not credited, but would serve to only reduce the final CO<sub>2</sub> numbers at one hour.

The ambient conditions in the MCR were evaluated using standard thermal equations and inputs from published references. The initial O<sub>2</sub> and CO<sub>2</sub> in the MCR were assumed based on ASHRAE 2005 Fundamentals and the normal intake/exhaust air flows. The O<sub>2</sub> was conservatively assumed to be 20% (normal is about 21%) and the CO<sub>2</sub> was 1000 ppm. The MCR volume was adjusted downward to account for cabinets, cables, and other equipment taking up air space in the room. Note that the MCR pressure envelope also includes the ESGR of each unit. For conservatism, and since operators spend more time in the MCR, the ESGR volumes have been intentionally not considered in the evaluation. The total volume of both ESGRs is almost twice as much of the MCR. From the O<sub>2</sub> and CO<sub>2</sub> perspective, it is very conservative to leave out the ESGR volumes.

The ASHRAE 2005 Fundamentals lists oxygen consumption for different exertions. For this effort, the O<sub>2</sub> consumption for moderate to high exertion (2 ft<sup>3</sup>/hr) was used. This was applied to an assumed number of twenty people in the MCR for the first hour, or an O<sub>2</sub> usage of about 40 ft<sup>3</sup>. This is very small compared to the initial O<sub>2</sub> available amount (at least 12,000 ft<sup>3</sup>) in the MCR. This is equivalent to a drop in O<sub>2</sub> content from 20% to 19.9%. Note that the MCR chillers and recirculation air handling equipment is still operating, thus mixing the air in the MCR so the CO<sub>2</sub> will not stagnate in one place.

For conservatism, a respiratory quotient (RQ = CO<sub>2</sub> exhaled to O<sub>2</sub> inhaled) of 1.0 was used. The ASHRAE 2005 Fundamentals advises an RQ of 1 for extremely heavy work. The CO<sub>2</sub> generated would therefore be 40 ft<sup>3</sup>. The initial amount of CO<sub>2</sub> in the MCR was used by converting the assumed level (1000 ppm) to mg/m<sup>3</sup>, and then using the MCR volume to get the CO<sub>2</sub> in mg. The CO<sub>2</sub> generated during the first hour was then added to the initial amount, and converted to ppm. The CO<sub>2</sub> at one hour was approximately 1500 ppm. The exposure limit expressed as an 8-hour Time-Weighted Average (TWA) value for CO<sub>2</sub> is 5000 ppm (Industrial Ventilation, 22<sup>nd</sup> Edition). Note that the TWA is acceptable for continuous operation for an 8-hour day for a 40-hr week.

Based on the above, removal of the bottled air system will have no adverse effects on the MCR operators or MCR/ESGR equipment.