

VIRGINIA ELECTRIC AND POWER COMPANY  
RICHMOND, VIRGINIA 23261

April 23, 2008

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

Serial No. 08-0092B  
NL&OS/ETS R0  
Docket No. 50-339  
License No. NPF-7

**VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)**  
**NORTH ANNA POWER STATION UNIT 2**  
**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING**  
**PROPOSED LICENSE AMENDMENT REQUEST**  
**ONE-TIME FIVE-YEAR EXTENSION TO TYPE A TEST INTERVAL**

In a December 5, 2007 letter (Serial No. 07-0769), Dominion requested an amendment, in the form of a change to the Technical Specifications to Facility Operating License Number NPF-7 for North Anna Power Station Unit 2. The proposed change will permit a one-time five-year exception to the ten (10) year frequency of the performance-based leakage rate testing program for Type A tests as required by Regulatory Guide (RG) 1.163. In a February 1, 2008 e-mail, the NRC requested additional information regarding the risk analysis performed to support the five-year interval extension. In a March 14, 2008 letter (Serial No. 08-0092) Dominion provided the information requested by the NRC.

In an e-mail dated March 31, 2008 and during a subsequent telephone call on April 3, 2008, the NRC requested clarification of the calculation of the Large Early Release Frequency (LERF) to support the five year test interval extension. The attachment to this letter provides the requested information.

The information provided in this letter does not affect the conclusion of the significant hazards consideration discussion provided in the December 5, 2007 Dominion letter (Serial No. 07-0769).



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Serial No. 08-0092B

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RAI - One-Time Five-Year Extension to Type A Test Interval

**Attachment**

**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING  
PROPOSED LICENSE AMENDMENT REQUEST  
ONE-TIME FIVE-YEAR EXTENSION TO TYPE A TEST INTERVAL**

**North Anna Power Station Unit 2  
Virginia Electric and Power Company  
(Dominion)**

**RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING  
PROPOSED LICENSE AMENDMENT REQUEST  
ONE-TIME FIVE-YEAR EXTENSION TO TYPE A TEST INTERVAL**

In an e-mail dated March 31, 2008 and a subsequent telephone call on April 3, 2008, the NRC requested clarification of the calculation of the Large Early Release Frequency (LERF) provided in Dominion's March 14, 2008, letter (Serial No. 08-0092) to support the five year test interval extension. The requested clarifications are provided below.

**NRC Question 1**

*On page 4 of 4 of the March 13, 2008 letter (Serial No 08-0092), Dominion states that the total baseline internal and fire LERF for North Anna (NAPS) is:  $8.20E-7$  (LERF for internal events) +  $1.11E-8$  (LERF for fire events) =  $8.31E-7$ . The second term is supposed to represent the baseline LERF for fire events. However, based on the development of this value on page 3 of 4, it actually represents only the contribution to fire event LERF from events involving large, pre-existing leakage. This accounts for only a portion of the fire event LERF. For example, if the conditional large early release probability for fire events was assumed to be equal to that for internal events, the baseline LERF for fire events would be:  $4.10E-6 \times 8.20E-7 / 3.5E-5 = 9.6E-8$ . This is nearly a decade higher than the baseline LERF for fire events provided by Dominion. Dominion needs to revisit and correct the assessment of the total LERF for internal and external events.*

**Dominion Response**

As discussed in the previous RAI response, the Core Damage Frequency (CDF) from fire initiating events was calculated to be  $4.10E-06/\text{yr}$  in the North Anna Individual Plant Examination of External Events (IPEEE). Because the EPRI methodology used for the integrated leak rate test (ILRT) extension request assigns a fraction of the CDF to LERF due to containment failure, a similar calculation can be performed with the fire CDF to estimate the fire LERF. The fire LERF is estimated by using the internal events ratios of the Class 3B frequencies for the Baseline, 10 year, and 15 year test interval to the CDF. Based on the ratio of the Class 3B frequency to the CDF, the fire LERFs are as follows:

**Total LERF Due to Containment Failure Including Fire\*\***

	Internal Events Ratio (Class 3B / 3.50E-05)	Internal Events LERF Due to Class 3B Events	Fire LERF (4.10E-06 * Internal Events Ratio)	Total LERF Due to Class 3B Events (Internal and Fire Events)
<b>Baseline</b>	0.0027	9.45E-08/yr	1.11E-08/yr	1.06E-07/yr
<b>10 year</b>	0.0090	3.15E-07/yr	3.69E-08/yr	3.52E-07/yr
<b>15 year</b>	0.0135	4.73E-07/yr	5.54E-08/yr	5.28E-07/yr

**\*\*Note: All LERF values are based on the Class 3B values**

The total  $\Delta$ LERF from the baseline to once-per-15 years (15 year metrics) is calculated as the difference between the total LERF values in the table above.

$$\Delta\text{LERF} = 15 \text{ year} - \text{Baseline}$$

$$\Delta\text{LERF} = 5.28\text{E-}07 - 1.06\text{E-}07 = 4.22\text{E-}07/\text{yr}$$

It should be noted that the method used above represents only the portion of the fire event LERF due to the contribution made by the EPRI Class 3B frequency. An estimate of the total fire contribution to LERF is made by using the current internal events LERF for North Anna to compute the internal events ratio that is used to determine the fire LERF. The results of this revised baseline LERF calculation are shown in the table below.

**Estimated Total Baseline LERF**

	Internal Events Ratio (LERF / 3.50E-05)	Internal Events LERF	Fire LERF (4.10E-06 * Internal Events Ratio)	Total LERF (Internal and Fire Events)
<b>Baseline</b>	0.0234	8.20E-07/yr	9.60E-08/yr	9.16E-07/yr

The total baseline LERF, internal events and fire, is estimated to be 9.16E-07/yr (i.e. 8.20E-07 + 9.60E-08 = 9.16E-07/yr).

Regulatory Guide 1.174 states that “small changes” in risk will be considered when the calculated increase in LERF is in the range of  $10^{-7}/\text{yr}$  to  $10^{-6}/\text{yr}$ , and the total LERF is below  $10^{-5}/\text{yr}$  (i.e. Region II). The impact of summing the estimates of fire LERF with the internal events LERF gives a total LERF value of 9.16E-07/yr and a  $\Delta$ LERF, due to containment failure, of 4.22E-07/yr. Thus, the risk associated with the ILRT extension is considered to be a “small change.”

## **NRC Question 2**

*Also, on page 4 of 4 of the March 13, 2008 letter (Serial No 08-0092), Dominion has estimated the delta LERF based on a change from once-per-10 years to once-per-15 years. In the NRC staff's view, this delta should be based on a change from three-times-per-10 years to once-per-15 years, in order to reflect the cumulative impact of the ILRT interval increase from the original three-times-per-10 years test frequency. Dominion needs to revise the estimated delta LERF accordingly, as part of the correction identified in item 1 above.*

## **Dominion Response**

The estimated delta LERF resulting from a change in the Type A ILRT interval from three-per-ten-years to once-per-fifteen-years is 4.22E-07/yr. The revised value is included in the response to question #1 above.