VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

April 20, 2006

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

Serial No. 06-312
NL&OS/GDM R0
Docket Nos. 50-338/339
50-280/281
License Nos. NPF-4/7
DPR-32/37

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA AND SURRY POWER STATIONS
30-DAY REPORT OF EMERGENCY CORE
COOLING SYSTEM (ECCS) MODEL CHANGES
PURSUANT TO THE REQUIREMENTS OF 10 CFR 50.46

In accordance with 10 CFR 50.46(a)(3)(ii), Virginia Electric and Power Company (Dominion) hereby submits information regarding changes to the Emergency Core Cooling System (ECCS) Evaluation Models for the Large Break Loss of Coolant Accident (LBLOCA) analyses for North Anna Power Station Units 1 and 2 and Surry Power Station Units 1 and 2 and their applications in existing licensing analyses.

Attachment 1 provides a report describing plant-specific evaluation model changes associated with the AREVA LBLOCA ECCS Evaluation Model for North Anna Units 1 and 2 and the Westinghouse LBLOCA ECCS Evaluation Model for Surry Units 1 and 2.

Information regarding the effect of the ECCS Evaluation Model changes upon the reported LBLOCA analyses of record (AOR) results is provided for North Anna Units 1 and 2 in Attachment 2 and for Surry Units 1 and 2 in Attachment 3. Based on the information in Attachment 2, the calculated peak cladding temperature (PCT) for the LBLOCA analysis for North Anna Unit 1 is 1974°F and for North Anna Unit 2 is 1958°F. Based on the information in Attachment 3, the calculated PCT for the LBLOCA analyses for Surry Units 1 and 2 is 2194°F. These results represent significant changes in PCT, as defined in 10 CFR 50.46(a)(3)(i).

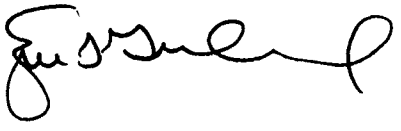
The LBLOCA results for North Anna Units 1 and 2 and Surry Units 1 and 2 are confirmed to have sufficient margin to the 2200°F limit of 10 CFR 50.46(b)(1). 10 CFR 50.46(a)(3)(ii) requires a 30-day report to be submitted that includes a "proposed schedule for providing a reanalysis or taking other action as may be needed to show compliance with Section 50.46 requirements." Based on Dominion's evaluation of this information and the associated changes in the applicable licensing basis PCT results, no further action is required to demonstrate compliance with the 10 CFR 50.46

requirements for North Anna Units 1 and 2. In a letter dated May 21, 2003 (Serial No. 03-350), Dominion had previously established a commitment to complete a reanalysis of the LBLOCA for Surry Units 1 and 2 by March 31, 2006. Subsequently, in a letter dated January 3, 2006 (Serial No. 05-828), Dominion revised the initial commitment date to complete the reanalysis of the LBLOCA, utilizing the NRC-approved Westinghouse ASTRUM methodology (WCAP-16009-P-A, January 2005), for Surry Units 1 and 2 by September 30, 2006.

This information satisfies the 30-day reporting requirements of 10 CFR 50.46(a)(3)(ii).

If you have any further questions regarding this submittal, please contact Mr. Gary Miller at (804) 273-2771.

Very truly yours,



E. S. Grecheck
Vice President – Nuclear Support Services

Commitments made in this letter:

No new commitments are being made in this letter; however, completion of the LBLOCA re-analysis for Surry Units 1 and 2 by September 30, 2006 was previously committed to in a letter dated January 3, 2006 (Serial No. 05-828).

Attachments:

1) Report of Changes in AREVA and Westinghouse Large Break LOCA ECCS Evaluation Models – North Anna Power Station Units 1 and 2, Surry Power Station Units 1 and 2.

2) Reporting of 10 CFR 50.46 Margin Utilization – AREVA Large Break LOCA ECCS Evaluation Model – North Anna Power Station Units 1 and 2.

3) Reporting of 10 CFR 50.46 Margin Utilization – Westinghouse Large Break LOCA ECCS Evaluation Model - Surry Power Station Units 1 and 2.

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ATTACHMENT 1

REPORT OF CHANGES IN AREVA AND WESTINGHOUSE LARGE BREAK LOCA ECCS EVALUATION MODELS

NORTH ANNA POWER STATION UNITS 1 AND 2
SURRY POWER STATION UNITS 1 AND 2

VIRGINIA ELECTRIC AND POWER COMPANY
(DOMINION)

Report of Changes in AREVA and Westinghouse Large Break LOCA ECCS Evaluation Models North Anna Power Station Units 1 and 2 Surry Power Station Units 1 and 2

North Anna Power Station Units 1 and 2

RLBLOCA Choked Flow Disposition

AREVA identified a Realistic Large Break Loss of Coolant Accident (RLBLOCA) evaluation model (EM) issue involving the modeling of break resistance. The RLBLOCA EM calls for the use of the S-RELAP5 code to compute break flow. The specified break area is not used when the break un-chokes, resulting in non-physical break flow discontinuities when the break switches from being choked to un-choked. A correction to this error provided for a continuous break flow when transitioning from choked to un-choked flow. AREVA evaluated the correction with respect to its impact on peak cladding temperature (PCT). The changes in PCT were ΔPCT = -26°F for North Anna Unit 1 and ΔPCT = +22°F for North Anna Unit 2.

RLBLOCA Changes in Uncertainty Parameters

Dominion updated Core Power, Initial RCS Flowrate, Initial Temperature, and Pressurizer Pressure statistical uncertainty parameters, which are applied for a RLBLOCA analysis for North Anna Units 1 and 2. AREVA evaluated these changes and determined that the impact on the RLBLOCA analysis results for North Anna Units 1 and 2 was a change in PCT of ΔPCT = +10°F.

Advanced Mark-BW Top Nozzle Modification

The Advanced Mark-BW fuel assembly top nozzle design for the most recent fuel batches supplied to North Anna Units 1 and 2 have been modified. Implementation of a 1/4-turn quick disconnect (QD) on the top nozzles caused a change in total flow area and wetted perimeter. AREVA performed an evaluation to determine the impact on the RLBLOCA analysis PCT results due to the change in the top nozzle flow area, form loss coefficients, and mass. The result of this evaluation indicates that the changes to the top nozzle design produce a change in PCT of ΔPCT = +65°F for North Anna Units 1 and 2.

Surry Power Station Units 1 and 2

Westinghouse IFBA Fuel Product Implementation

The current large break LOCA analysis for Surry Units 1 and 2 was performed using the Westinghouse BASH Evaluation Model. The LOCBART computer code is one of

the codes used in the Westinghouse Evaluation Model. The LOCBART code calculates the cladding temperature and oxidation transients for the highest powered fuel rod in the core, which are ultimately reviewed against the acceptance criteria of 10 CFR 50.46.

As part of an evaluation and analysis supporting the use of the Westinghouse Integral Fuel Burnable Absorber (IFBA) fuel product at Surry Units 1 and 2, Dominion quantified a Surry-specific sensitivity to assess the impact of implementation of the Westinghouse IFBA fuel product using the Westinghouse BASH Evaluation Model. The limiting skewed axial shape was used to quantify the effect on LBLOCA PCT. The analysis included the IFBA-specific PAD-4.0 fuel parameter data. The impact on LBLOCA PCT was determined by performing parametric sensitivity cases using the LOCBART code. Dominion quantified the effect of this item as ΔPCT = +41°F.

LOCBART Fluid Property Logic Issue – Augmented

In a letter dated June 30, 2005 (Serial No. 05-380), Dominion previously reported the effect on LBLOCA PCT due to the LOCBART Fluid Property Logic Issue. Surry Units 1 and 2 were identified as having 'Early-Reflood' PCTs, which resulted in a ΔPCT = 10°F for the LOCBART Fluid Property Logic Issue. An Early-Reflood PCT occurs within seventy (70) seconds after the LBLOCA occurs.

In a letter dated January 3, 2006 (Serial No. 05-828), Dominion provided a PCT assessment using revised containment heat sink data. As a result of this assessment, the time of PCT was increased to beyond 70 seconds. PCTs occurring between approximately 70 to 140 seconds after the LBLOCA occurs are defined to be 'Mid-Reflood' PCTs. The effect on PCT due to the LOCBART Fluid Property Logic Issue for Mid-Reflood PCTs is ΔPCT = +20°F. Since a +10°F PCT penalty had been previously reported to the NRC in a letter dated June 30, 2005 (Serial No. 05-380), an additional ΔPCT = +10°F was applied to augment the impact on PCT due to the LOCBART Fluid Property Logic Issue resulting from the revised containment heat sink assessment.

Another PCT assessment for the LOCBART Fluid Property Logic Issue is necessary with the implementation of the Westinghouse IFBA fuel product. The PCT for IFBA with the limiting skewed axial power shape occurs prior to 70 seconds after the LBLOCA occurs (i.e., Early-Reflood PCT). The appropriate effect on PCT due to the LOCBART Fluid Property Logic Issue is ΔPCT = +10°F. However, as noted above, the previous submittals to the NRC reported both a +10°F penalty and an additional +10°F augmentation due to the LOCBART Fluid Property Logic Issue. In order to make the accrued penalty equal +10°F, an additional ΔPCT = -10°F will be applied to augment the impact on PCT due to the LOCBART Fluid Property Logic Issue resulting from the IFBA Fuel Product Implementation assessment.

Conclusion

Dominion has performed an evaluation of PCT for comparison to 10 CFR 50.46 requirements. Considering the current PCT changes, as well as previously reported changes, the corrected LBLOCA PCTs are 1974°F and 1958°F for North Anna Units 1 and 2, respectively, and 2194°F for both Surry Units 1 and 2. Therefore, the LBLOCA results have sufficient margin to the 2200°F limit specified in 10 CFR 50.46(b)(1). The PCT assessments for 10 CFR 50.46(a)(3)(i) accumulation are greater than the 50°F limit for reporting for both North Anna Units 1 and 2 and Surry Units 1 and 2; hence, the changes are significant and submittal of a 30-day report to the NRC is required.

ATTACHMENT 2

REPORTING OF 10 CFR 50.46 MARGIN UTILIZATION

AREVA LARGE BREAK LOCA ECCS EVALUATION MODEL

NORTH ANNA POWER STATION UNITS 1 AND 2

VIRGINIA ELECTRIC AND POWER COMPANY
(DOMINION)

10 CFR 50.46 Margin Utilization – AREVA Large Break LOCA

Plant Name:	North Anna Power Station, Unit 1		
Utility Name:	Virginia Electric and Power Company		
Analysis Information			
EM:	AREVA RLBLOCA EM	**Limiting Break Size:**	DEGB
Analysis Date:	2004		
Vendor:	AREVA		
FQ:	2.32	**FΔH:**	1.65
Fuel:	Mixed NAIF/Advanced Mark-BW	**SGTP (%):**	12
Notes:	None		

		Clad Temp (°F)	Notes
LICENSING BASIS			
	Analysis of Record PCT	1853	
PCT ASSESSMENTS (Delta PCT)			
A.	**Prior ECCS Model Assessments**		
1.	Forslund-Rohsenow Correlation Modeling	64	
2.	RWST Temperature Assumption	8	
3.	LBLOCA/Seismic SG Tube Collapse	0	{1}
B.	**Planned Plant Modification Evaluations**		
1.	Advanced Mark-BW Top Nozzle Modification	65	{2}
C.	**2005 ECCS Model Assessments**		
1.	RLBLOCA Choked Flow Disposition	-26	{2}
2.	RLBLOCA Changes in Uncertainty Parameters	10	{2}
D.	**Other**		
1.	None	0	
LICENSING BASIS PCT + MARGIN ALLOCATIONS		**PCT =** 1974	

Notes:

{1} A generic steam generator LOCA/seismic load evaluation was performed by Westinghouse to quantify the potential steam generator tube collapse, which may occur at the time of the LOCA due to combined LOCA and seismic loads. Based on this analysis, a total steam generator tube reduction equivalent to 5% tube plugging was allocated as a permanent assessment for those plants that do not have a detailed analysis. The 5% steam generator tube plugging reduction will be used to account for the effects of a combined LOCA/seismic event at North Anna Unit 1 with the AREVA evaluation model.

{2} The accumulation of changes for these items (sum of absolute magnitudes) since the last 30-day report or reanalysis is greater than 50°F and **is** significant, as defined in 10CFR50.46(a)(3)(i).

10 CFR 50.46 Margin Utilization – AREVA Large Break LOCA

Plant Name:	North Anna Power Station, Unit 2		
Utility Name:	Virginia Electric and Power Company		
Analysis Information			
EM:	AREVA RLBLOCA EM	**Limiting Break Size:**	DEGB
Analysis Date:	2004		
Vendor:	AREVA		
FQ:	2.32	**FΔH:**	1.65
Fuel:	Mixed: NAIF/Advanced Mark-BW	**SGTP (%):**	12
Notes:	None		

		Clad Temp (°F)	Notes
LICENSING BASIS			
	Analysis of Record PCT	1789	
PCT ASSESSMENTS (Delta PCT)			
A.	**Prior ECCS Model Assessments**		
1.	Forslund-Rohsenow Correlation Modeling	64	
2.	RWST Temperature Assumption	8	
3.	LBLOCA/Seismic SG Tube Collapse	0	{1}
B.	**Planned Plant Modification Evaluations**		
1.	Advanced Mark-BW Top Nozzle Modification	65	{2}
C.	**2005 ECCS Model Assessments**		
1.	RLBLOCA Choked Flow Disposition	22	{2}
2.	RLBLOCA Changes in Uncertainty Parameters	10	{2}
D.	**Other**		
1.	None	0	
LICENSING BASIS PCT + MARGIN ALLOCATIONS		**PCT =** 1958	

Notes:

{1} A generic steam generator LOCA/seismic load evaluation was performed by Westinghouse to quantify the potential steam generator tube collapse, which may occur at the time of the LOCA due to combined LOCA and seismic loads. Based on this analysis, a total steam generator tube reduction equivalent to 5% tube plugging was allocated as a permanent assessment for those plants that do not have a detailed analysis. The 5% steam generator tube plugging reduction will be used to account for the effects of a combined LOCA/seismic event at North Anna Unit 2 with the AREVA evaluation model.

{2} The accumulation of changes for these items (sum of absolute magnitudes) since the last 30-day report or reanalysis is greater than 50°F and **is** significant, as defined in 10CFR50.46(a)(3)(i).

ATTACHMENT 3

REPORTING OF 10 CFR 50.46 MARGIN UTILIZATION

WESTINGHOUSE LARGE BREAK LOCA ECCS EVALUATION MODEL

SURRY POWER STATION UNITS 1 AND 2

VIRGINIA ELECTRIC AND POWER COMPANY
(DOMINION)

10 CFR 50.46 Margin Utilization – Westinghouse Large Break LOCA

Plant Name:	Surry Power Station, Unit 1		
Utility Name:	Virginia Electric and Power Company		
Analysis Information			
EM:	BASH	**Limiting Break Size:**	Cd=0.4
Analysis Date:	2001		
Vendor:	Westinghouse		
FQ:	2.32	**FΔH:**	1.62
Fuel:	SIF	**SGTP (%):**	15
Notes:	None		

		Clad Temp (°F)	Notes
LICENSING BASIS			
	Analysis of Record PCT	2117	
PCT ASSESSMENTS (Delta PCT)			
A.	**Prior ECCS Model Assessments**		
1.	LBLOCA/Seismic SG Tube Collapse	0	{1}
2.	BASH EM Transient Termination	0	
3.	LOCBART Fluid Property Logic Issue	10	
B.	**Planned Plant Modification Evaluations**		
1.	Westinghouse IFBA Fuel Product Implementation	41	{2}
C.	**2005 ECCS Model Assessments**		
1.	LOCBART ZIRLO™ Cladding Specific Heat Model Error	16	
2.	PAD 4.0 Initial Pellet Temperatures	-11	
3.	Removal of Part-Length CRDMs	-66	
4.	Pressurizer Surge Line Piping Schedule Reconciliation	8	
5.	LOCBART Fluid Property Logic Issue-Augmented	10	
6.	Revised Containment Heat Sink Input	113	
7.	Revised Containment Spray Flowrate	-17	
8.	Revised Containment Free Volume	-17	
D.	**2006 ECCS Model Assessments**		
1.	LOCBART Fluid Property Logic Issue-Augmented	-10	{2}
E.	**Other**		
1.	None	0	
LICENSING BASIS PCT + MARGIN ALLOCATIONS		**PCT =**	**2194**

Notes:

{1} A generic steam generator LOCA/seismic load evaluation was performed by Westinghouse to quantify the potential steam generator tube collapse, which may occur at the time of the LOCA due to combined LOCA and seismic loads. Based on this analysis, a total steam generator tube reduction equivalent to 5% tube plugging was allocated as a permanent assessment for those plants that do not have a detailed analysis. The 5% steam generator tube plugging reduction will be used to account for the effects of a combined LOCA/seismic event at Surry.

{2} The accumulation of changes for these items (sum of absolute magnitudes) since the last 30-day report or reanalysis is greater than 50°F and **is** significant, as defined in 10CFR50.46(a)(3)(i).

10 CFR 50.46 Margin Utilization – Westinghouse Large Break LOCA

Plant Name:	Surry Power Station, Unit 2		
Utility Name:	Virginia Electric and Power Company		
Analysis Information			
EM:	BASH	**Limiting Break Size:**	Cd=0.4
Analysis Date:	2001		
Vendor:	Westinghouse		
FQ:	2.32	**FΔH:**	1.62
Fuel:	SIF	**SGTP (%):**	15
Notes:	None		

		Clad Temp (°F)	Notes
LICENSING BASIS			
	Analysis of Record PCT	2117	
PCT ASSESSMENTS (Delta PCT)			
A.	**Prior ECCS Model Assessments**		
1.	LBLOCA/Seismic SG Tube Collapse	0	{1}
2.	BASH EM Transient Termination	0	
3.	LOCBART Fluid Property Logic Issue	10	
B.	**Planned Plant Modification Evaluations**		
1.	Westinghouse IFBA Fuel Product Implementation	41	{2}
C.	**2005 ECCS Model Assessments**		
1.	LOCBART ZIRLO™ Cladding Specific Heat Model Error	16	
2.	PAD 4.0 Initial Pellet Temperatures	-11	
3.	Removal of Part-Length CRDMs	-66	
4.	Pressurizer Surge Line Piping Schedule Reconciliation	8	
5.	LOCBART Fluid Property Logic Issue-Augmented	10	
6.	Revised Containment Heat Sink Input	113	
7.	Revised Containment Spray Flowrate	-17	
8.	Revised Containment Free Volume	-17	
D.	**2006 ECCS Model Assessments**		
1.	LOCBART Fluid Property Logic Issue-Augmented	-10	{2}
E.	**Other**		
1.	None	0	
LICENSING BASIS PCT + MARGIN ALLOCATIONS		**PCT =**	**2194**

Notes:

{1} A generic steam generator LOCA/seismic load evaluation was performed by Westinghouse to quantify the potential steam generator tube collapse, which may occur at the time of the LOCA due to combined LOCA and seismic loads. Based on this analysis, a total steam generator tube reduction equivalent to 5% tube plugging was allocated as a permanent assessment for those plants that do not have a detailed analysis. The 5% steam generator tube plugging reduction will be used to account for the effects of a combined LOCA/seismic event at Surry.

{2} The accumulation of changes for these items (sum of absolute magnitudes) since the last 30-day report or reanalysis is greater than 50°F and **is** significant, as defined in 10CFR50.46(a)(3)(i).