VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

January 3, 2006

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

Serial No. 05-828
NL&OS/GDM R0'
Docket Nos. 50-280/281
License Nos. DPR-32/37

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
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 Westinghouse Emergency Core Cooling System (ECCS) Evaluation Model for the Large Break Loss of Coolant Accident (LBLOCA) analysis for Surry Power Station Units 1 and 2 and its application in existing licensing analyses.

Attachment 1 provides a report describing plant-specific evaluation model changes associated with 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 Surry Units 1 and 2 in Attachment 2. To summarize the information in Attachment 2, the calculated peak cladding temperature (PCT) for the LBLOCA analyses for Surry Units 1 and 2 is 2163°F. This result represents a significant change in PCT, as defined in 10 CFR 50.46(a)(3)(i).

The LBLOCA results for 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 that the 30-day report include a "proposed schedule for providing a reanalysis or taking other action as may be needed to show compliance with Section 50.46 requirements." In a letter dated May 21, 2003 (Serial No. 03-350), Dominion established a commitment to complete a reanalysis of the LBLOCA accident for Surry Units 1 and 2 by March 31, 2006. The reanalysis, which employs the NRC-approved Westinghouse ASTRUM methodology (WCAP-16009-P-A, January 2005), is underway. Our original schedule has been adversely impacted by the need to verify key design input data associated with the containment passive heat sink error reported in this letter. We have completed this verification activity and established a revised analysis schedule, which requires a

change to our commitment date. The new schedule is to complete the reanalysis of the LBLOCA accident 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 D. Miller at (804) 273-2771.

Very truly yours,

L. N. Hartz
Vice President – Nuclear Engineering

Commitments made in this letter:

1. No new commitments are being made in this letter; however, the schedule for submittal of the LBLOCA re-analysis for Surry Units 1 and 2 previously committed to in a letter dated May 21, 2003 (Serial No. 03-350), has been revised to September 30, 2006.

Attachments:

1) Report of Changes in Westinghouse Large Break LOCA ECCS Evaluation Model - Surry Power Station Units 1 and 2.

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

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

Mr. S. R. Monarque
U. S. Nuclear Regulatory Commission
One White Flint North
11555 Rockville Pike
Mail Stop 8H12
Rockville, MD 20852

Mr. N. P. Garrett
NRC Senior Resident Inspector
Surry Power Station

ATTACHMENT 1

REPORT OF CHANGES IN WESTINGHOUSE LARGE BREAK LOCA ECCS EVALUATION MODEL

SURRY POWER STATION UNITS 1 AND 2

VIRGINIA ELECTRIC AND POWER COMPANY
(DOMINION)

Report of Changes in
Westinghouse Large Break LOCA ECCS Evaluation Model
Surry Power Station Units 1 and 2

Dominion recently performed site-specific sensitivity cases for the large break LOCA analysis for Surry Power Station Units 1 and 2. As a result of this analysis, changes in the PCT licensing basis were identified and assessed. The results of this PCT assessment are provided below.

Identification of ECCS EM Changes

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. The COCO computer code is another code used in the Westinghouse BASH Evaluation Model. The COCO code is used for calculating the large break LOCA containment backpressure transient. Minimum containment backpressure is conservative for calculation of peak cladding temperature (PCT) during a large break LOCA.

Dominion identified that the input for metal heat sink surface area and mass for calculating large break LOCA containment backpressure using the COCO code in the Surry large break LOCA analysis of record was insufficient for determining conservative PCT. Dominion quantified the effects of five separate changes to the BASH large break LOCA Evaluation Model for Surry Units 1 and 2 that resulted from identification of the containment heat sink issue. The five separate changes addressed in this evaluation are summarized below.

Revised Containment Heat Sink Input

Dominion quantified a Surry-specific sensitivity result to assess the impact on PCT of revised containment heat sink input to the COCO computer code. The Surry-specific sensitivity result quantifies the effect of this item as ΔPCT=113°F. The Analysis of Record PCT is based on a cosine axial power shape. As part of this sensitivity, it was determined that a skewed power shape became the limiting shape when combined with the revised containment heat sink input. The use of the skewed power shape bounds the cosine shape and was used to determine the PCT penalty for the revised containment heat sink input.

Revised Containment Spray Flow Rate

Dominion quantified a Surry-specific sensitivity to assess the impact on PCT of reduced containment spray flow rate. The containment spray flow rate was reduced from 6500 GPM to 4500 GPM. The reduced spray flow rate remains conservative but more consistent with design values. The limiting skewed shape with the revised containment heat sink input was used to quantify the PCT effect of reduced containment spray flow rate. The Surry-specific sensitivity result quantifies the effect of this item as ΔPCT = -17°F.

Revised Containment Free Volume

Dominion quantified a Surry-specific sensitivity to assess the impact on PCT of reduced containment free volume. The containment free volume was reduced from 1.863E+6 ft^3 to 1.819E+6 ft^3. The reduced containment free volume remains conservative but more consistent with design values. The limiting skewed shape with the revised containment heat sink input was used to quantify the PCT effect of reduced containment free volume. The effect on PCT was determined to be ΔPCT= -17°F.

PAD 4.0 Initial Pellet Temperatures

Reference 1 previously reported the effect on large break LOCA PCT of using PAD 4.0 fuel property data versus PAD 3.4 as a ΔPCT = -122°F (a PCT benefit). As described above, the assessment of the revised containment heat sink inputs identified the skewed power shape as the limiting shape. Therefore, the PAD 4.0 Initial Pellet Temperature effect on PCT was revised to incorporate the skewed power shape as the limiting case with the PAD 4.0 fuel data. The revised effect on PCT due to this item was evaluated to be ΔPCT = -11°F.

LOCBART Fluid Property Logic Issue – Augmented

Reference 2 previously reported the effect on large break LOCA 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 70 seconds after the large break LOCA occurs. As a result of the assessment of the containment heat sinks with the limiting skewed power shape described above, the time of PCT was increased to beyond 70 seconds. PCTs occurring between approximately 70 to 140 seconds after the large break LOCA 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 was previously reported to the NRC in Reference 2, an additional ΔPCT = 10°F will be applied to augment the impact on PCT due to the LOCBART Fluid Property Logic Issue.

Conclusion

Dominion has performed an evaluation of PCT for comparison to 10 CFR 50.46 requirements. The Analysis of Record PCT is 2117°F. Considering the current PCT changes as well as all previously reported changes, the corrected large break LOCA PCT is 2163°F. The Surry Power Station Units 1 and 2 large break LOCA 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; hence, the changes are significant and submittal of a 30-Day Report to the NRC is required.

References

1. Letter from E. S. Grecheck (Va. Electric & Power Co.) to USNRC, "Virginia Electric and Power Company, Surry Power Station Units 1 and 2, 30-Day Report of Emergency Core Cooling System (ECCS) Model Changes Pursuant to the Requirements of 10CFR50.46," Serial No. 05-383, dated July 7, 2005.

2. Letter from E. S. Grecheck (Va. Electric & Power Co.) to USNRC, "Dominion Nuclear Connecticut, Inc., Virginia Electric and Power Company, Millstone Power Station Units 2 and 3, North Anna Power Station Units 1 and 2, Surry Power Station Units 1 and 2, 2004 Annual Report of Emergency Core Cooling System Model Changes Pursuant to the Requirements of 10CFR50.46," Serial No. 05-380, dated June 30, 2005.

ATTACHMENT 2

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	
MARGIN ALLOCATIONS (Delta PCT)			
A.	**Prior Permanent 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 Change Evaluations**		
1.	None	0	
C.	**2005 Permanent ECCS Model Assessments**		
1.	LOCBART ZIRLO™ Cladding Specific Heat Model Error	16	
2.	PAD 4.0 Initial Pellet Temperatures	-11	{2}
3.	Removal of Part-Length CRDMs	-66	
4.	Pressurizer Surge Line Piping Schedule Reconciliation	8	
5.	LOCBART Fluid Property Logic Issue-Augmented	10	{2}
6.	Revised Containment Heat Sink Input	113	{2}
7.	Revised Containment Spray Flowrate	-17	{2}
8.	Revised Containment Free Volume	-17	{2}
D.	**Temporary ECCS Model Issues**		
1.	None	0	
E.	**Other Margin Allocations**		
1.	None	0	
LICENSING BASIS PCT + MARGIN ALLOCATIONS		**PCT =**	**2163**

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	
MARGIN ALLOCATIONS (Delta PCT)			
A.	**Prior Permanent 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 Change Evaluations**		
1.	None	0	
C.	**2005 Permanent ECCS Model Assessments**		
1.	LOCBART ZIRLO™ Cladding Specific Heat Model Error	16	
2.	PAD 4.0 Initial Pellet Temperatures	-11	{2}
3.	Removal of Part-Length CRDMs	-66	
4.	Pressurizer Surge Line Piping Schedule Reconciliation	8	
5.	LOCBART Fluid Property Logic Issue-Augmented	10	{2}
6.	Revised Containment Heat Sink Input	113	{2}
7.	Revised Containment Spray Flowrate	-17	{2}
8.	Revised Containment Free Volume	-17	{2}
D.	**Temporary ECCS Model Issues**		
1.	None	0	
E.	**Other Margin Allocations**		
1.	None	0	
LICENSING BASIS PCT + MARGIN ALLOCATIONS		**PCT =**	**2163**

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).