VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

February 27, 2014

10 CFR 50.46(a)

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

Serial No. 14-082
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 and errors in Westinghouse's Large Break Loss of Coolant Accident (LBLOCA) Emergency Core Cooling System (ECCS) Evaluation Model for Surry Power Station Units 1 and 2 (SPS 1 and 2) on Peak Clad Temperature (PCT).

Attachment 1 provides a report describing the changes and errors associated with the Westinghouse LBLOCA ECCS Evaluation Model for SPS 1 and 2.

Information regarding the effect of the PCT changes to the reported LBLOCA rack-up is provided for SPS 1 and 2 in Attachment 2. To summarize the information in Attachment 2, since the last 30 day report the sum of the absolute values of the changes in calculated PCT for the LBLOCA analyses is 58 °F with a total change of 44 °F. The new value of PCT stands at 2081 °F for SPS 1 and 2. This result represents a significant change in PCT, as defined in 10 CFR 50.46(a)(3)(i).

10 CFR 50.46(a)(3)(ii) requires the licensee to provide a report within 30 days, which includes a proposed schedule for providing a reanalysis or taking other action as may be needed to show compliance with 10 CFR 50.46. Dominion has reviewed the information provided by Westinghouse and determined that the adjusted LBLOCA PCT values and the manner in which they were derived continue to conform to the requirements of 10 CFR 50.46. As such, Dominion considers the scheduler requirements of 10CFR 50.46(a)(3)(ii) to be satisfied with the submission of this notification. Dominion routinely tracks adjustments to the LBLOCA calculated PCT values to ensure that reasonable margins to the acceptance value set by 10 CFR 50.46 are maintained.

Dominion, in Letter 12-420 dated July 10, 2012, has previously committed to a reanalysis of the LBLOCA prior to June 15, 2017 for issues concerning fuel pellet Thermal Conductivity Degradation. The LBLOCA Evaluation Model PCT assessments identified herein do not adversely affect the reanalysis schedule of June 15, 2017. Since the last 30

A002
NRR

day report, the PCT has increased by 44 °F to a licensing basis PCT of 2081 °F. Given the new issues discussed herein, the reanalysis schedule of June 15, 2017 remains acceptable. The reanalysis will address the known PCT rack up items at the time of the analysis.

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,

Mark D. Sartain
Vice President – Nuclear Engineering

Commitments made in this letter: None

Attachments: (2)

1) Report of Changes and Errors in Westinghouse ASTRUM Large Break LOCA ECCS Evaluation Model

2) 30 Day Reporting of 10 CFR 50.46 Margin Utilization – Surry Power Station Units 1 and 2.

cc: U.S. Nuclear Regulatory Commission, Region II
Regional Administrator
Marquis One Tower
245 Peachtree Center Ave. NE Suite 1200
Atlanta, GA 30303-1257

Ms. M. C. Barillas
NRC Project Manager - Surry
U. S. Nuclear Regulatory Commission
One White Flint North
Mail Stop O8 G-9A
11555 Rockville Pike
Rockville, MD 20852-2738

Dr. V. Sreenivas
NRC Project Manager – North Anna
U. S. Nuclear Regulatory Commission
One White Flint North
Mail Stop O8 G-9A
11555 Rockville Pike
Rockville, MD 20852-2738

NRC Senior Resident Inspector
Surry Power Station

Attachment 1

REPORT OF CHANGES AND ERRORS IN WESTINGHOUSE ASTRUM LARGE BREAK LOCA ECCS EVALUATION MODEL

Virginia Electric and Power Company
(Dominion)
Surry Power Station Units 1 and 2

Report of Changes and Errors in Westinghouse ASTRUM Large Break LOCA ECCS Evaluation Model

Since the submittal of the last 10 CFR 50.46 30-day report, Westinghouse has informed Dominion of nineteen (19) changes to the Peak Cladding Temperature (PCT) ASTRUM Best Estimate (BE) Large Break Loss of Coolant Accident (LBLOCA) licensing basis for Surry Power Station (Surry) Units 1 and 2, and these changes are described below. Pursuant to requirements of 10 CFR 50.46, Dominion has reviewed these changes and determined that they represent a significant change in PCT, as defined in 10 CFR 50.46(a)(3)(i).

HOTSPOT BURST TEMPERATURE CALCULATION FOR ZIRLO CLADDING

A problem was identified in the calculation of the burst temperature for ZIRLO cladding in the HOTSPOT code when the cladding engineering hoop stress exceeds 15,622 psi. This problem results in either program failure or an invalid extrapolation of the burst temperature vs. engineering hoop stress table. This problem has been evaluated for impact on existing analyses. The evaluation of existing analyses demonstrated no impact on the overall PCT results, leading to an estimated effect of 0°F.

ROD INTERNAL PRESSURE CALCULATION

Several issues that affect the calculation of rod internal pressure (RIP) have been identified for certain BE LBLOCA evaluation models (EMs). These issues include the sampling of RIP uncertainties, updating HOTSPOT to consider the effect of transient RIP variations in the application of the uncertainty, and generating RIPs at a consistent rod power. These issues have been evaluated to estimate the impact on existing LBLOCA analysis results. These issues represent a closely-related group of changes. The effects described above are either judged to have a negligible effect on existing LBLOCA analysis results or have been adequately incorporated into the thermal conductivity degradation evaluations, leading to an estimated PCT impact of 0°F.

HOTSPOT ITERATION ALGORITHM FOR CALCULATING THE INITIAL FUEL PELLET AVERAGE TEMPERATURE

The HOTSPOT code has been updated to incorporate the following corrections to the iteration algorithm for calculating the initial fuel pellet average temperature: (1) bypass the iteration when the input value satisfies the acceptance criterion; (2) prevent low-end extrapolation of the gap heat transfer coefficient; (3) prevent premature termination of the iteration that occurred under certain conditions; and (4) prevent further adjustment of the gap heat transfer coefficient after reaching the iteration limit. These changes represent a closely-related group of changes. Sample calculations and engineering judgment lead to an estimated PCT impact of 0°F.

WCOBRA/TRAC THERMAL-HYDRAULIC HISTORY FILE DIMENSION USED IN HSDRIVER

A problem was identified in the dimension of the WCOBRA/TRAC thermal-hydraulic history file used in HSDRIVER. The array that is used to store the information from the WCOBRA/TRAC thermal-hydraulic history file is dimensioned to 3000 in HSDRIVER. However, it is possible for this file to contain more than 3000 curves. If that is the case, it is possible that the curves would not be used correctly in the downstream HOTSPOT execution. An extent-of-condition review indicated that resolution of this issue does not impact the PCT calculation for prior LBLOCA analyses. Resolution of this issue does not impact the PCT calculation for prior LBLOCA analyses, which leads to a PCT impact of 0°F.

WCOBRA/TRAC AUTOMATED RESTART PROCESS LOGIC ERROR

A minor error was identified in the WCOBRA/TRAC Automated Restart Process (WARP) logic for defining the Double-Ended Guillotine (DEG) break tables. The error has been evaluated for impact on current licensing basis analysis results and will be incorporated into the plant-specific analyses on a forward-fit basis. This error was evaluated to have a negligible impact on the Large Break LOCA analysis results, leading to an estimated PCT impact of 0°F.

INITIAL FUEL PELLET AVERAGE TEMPERATURE UNCERTAINTY CALCULATION

In the ASTRUM BE LBLOCA EM, uncertainties are applied to the gap heat transfer coefficient and pellet thermal conductivity to capture the uncertainty in the initial fuel pellet average temperature. This approach was compared to the initial fuel pellet average temperature uncertainties predicted by the PAD code at beginning-of-life conditions and found to be conservative (in Section 25-4-2-4 of WCAP-12945-P-A). However, the initial fuel pellet average temperature uncertainty range analyzed at higher burnups in the ASTRUM EM is much wider than the uncertainty range predicted by the PAD code, which may result in excessively low or high analyzed initial fuel pellet average temperatures. This issue has been evaluated to estimate the impact on existing ASTRUM LBLOCA analysis results. The resolution of this issue represents a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451.

The issue described above is judged to have either no effect or a negligible effect on existing Surry Units 1 and 2 LBLOCA analysis results, leading to an estimated PCT impact of 0°F.

Westinghouse has informed Dominion that twelve of the errors are a result of code development and maintenance. Several errors in the WCOBRA/TRAC code used for best estimate large break loss of coolant accident (BELOCA) analysis in the ASTRUM evaluation model (EM) were identified. Some of the errors affected the

WCOBRA/TRAC heat transfer models, the heat transfer node initialization or the heat transfer re-noding logic, as well as other models. There were eleven identified issues, each with an estimated 0°F PCT impact. These changes to WCOBRA/TRAC are described in the eleven discussions below.

ELEVATIONS FOR HEAT SLAB TEMPERATURE INITIALIZATION

An error was discovered in WCOBRA/TRAC whereby an incorrect value would be used in the initial fuel rod temperature calculation for a fuel rod heat transfer node if that node elevation was specified outside of the bounds of the temperature initialization table. This problem has been evaluated for impact on existing analyses, and its resolution represents a Discretionary Change in accordance with Section 4.1.1 of WCAP- 13451.

Based on inspection of plant analysis input, it was concluded that the input decks for the existing Surry Units 1 and 2 analysis is not impacted by this error, leading to an estimated PCT impact of 0°F.

HEAT TRANSFER MODEL ERROR CORRECTIONS

Several related changes were made to WCOBRA/TRAC to correct discovered errors that affected the heat transfer models. These errors included calculation of the entrained liquid fraction used in calculation of the drop wall heat flux, application of the grid enhancement factor for grid temperature calculation, calculation of the Reynolds number used in the Wong-Hochrieter correlation for the heat transfer coefficient from fuel rods to vapor, fuel rod initialization and calculation of cladding inner radius with creep, application of grid and two phase enhancement factors and radiation component in single phase vapor heat transfer, and reset of the critical heat flux temperature when J=2. These errors have been evaluated to estimate the impact on existing LBLOCA analysis results. Correction of these errors represents a closely-related group of Non-Discretionary Changes in accordance with Section 4.1.2 of WCAP-13451.

Based on the results of representative plant calculations, separate effects and integral effects test simulations, it is concluded that the error corrections have a negligible local effect on heat transfer, leading to an estimated PCT impact of 0°F.

CORRECTION TO HEAT TRANSFER NODE INITIALIZATION

An error was discovered in the heat transfer node initialization logic in WCOBRA/TRAC whereby the heat transfer node center locations could be inconsistent with the geometric node center elevations. The primary effects of this issue are on the interpolated fluid properties and grid turbulent mixing enhancement at the heat transfer node. This problem has been evaluated for impact on existing analyses, and its resolution represents a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451.

Based on engineering judgment and the results from a matrix of representative plant calculations, it is concluded that the effect of this error is within the code resolution, leading to an estimated PCT impact of 0°F.

MASS CONSERVATION ERROR FIX

It was identified that mass was not conserved in WCOBRA/TRAC one-dimensional component cells when void fraction values were calculated to be slightly out of the physical range (greater than 1.0 or smaller than 0.0). This was observed to result in artificial mass generation on the secondary side of steam generator components. Correction of this problem represents a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451.

This error was observed to primarily affect the mass on the secondary side of the steam generator. This issue was judged to have a negligible impact on the Surry Units 1 and 2 LBLOCA analysis results, leading to an estimated PCT impact of 0°F.

CORRECTION TO SPLIT CHANNEL MOMENTUM EQUATION

An error was discovered in the momentum equation calculations for split channels in WCOBRA/TRAC. This error impacts the: (1) continuity area of the phantom/ boundary bottom cell; (2) bottom and top continuity area correction factors for the channel inlet at the bottom of a section and for the channel outlet at the top of a section; and (3) drop entrainment mass rate per unit volume and drop de-entrainment mass rate per unit volume contributions to the momentum calculations for split channels. This problem has been evaluated for impact on existing analyses, and its resolution represents a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451.

Based on the results from a matrix of representative plant calculations, it is concluded that the effect of this error on the quantities directly impacted by the momentum equation calculations for split channels (velocities, flows, etc.) is negligible, leading to an estimated PCT impact of 0°F.

HEAT TRANSFER LOGIC CORRECTION FOR ROD BURST CALCULATION

A change was made to the WCOBRA/TRAC coding to correct an error which had disabled rod burst in separate effect test simulations. This change represents a Discretionary Change in accordance with Section 4.1.1 of WCAP-13451.

Based on the nature of the change and the evaluation model requirements for plant modeling in Westinghouse BELOCA analyses with WCOBRA/TRAC, it is judged that the existing Surry Units 1 and 2 analyses are not impacted by this change, leading to an estimated PCT impact of 0°F.

CHANGES TO VESSEL SUPERHEATED STEAM PROPERTIES

Several related changes were made to the WCOBRA/TRAC coding for the vessel super-heated water properties, including updating the HGAS subroutine coding to be consistent with Equation 10-6 of the Code Qualification Document (CQD) topical WCAP-12945-P-A, updating the approximation of the enthalpy in the TGAS subroutine to be consistent with the HGAS subroutine coding, and updating the temperature iteration method and convergence criteria in the TGAS subroutine. These changes represent a closely related group of Non-Discretionary Changes in accordance with Section 4.1.2 of WCAP-13451.

The updates to the calculations of the superheated steam properties had generally less than 1°F impact on the resulting steam temperature values, leading to an estimated PCT impact of 0°F.

UPDATE TO METAL DENSITY REFERENCE TEMPERATURES

It was identified that for one-dimensional components in which heat transfer to stainless steel 304 or 316 is modeled, the reference temperature for the metal density calculation was allowed to vary; as a result the total metal mass was not preserved. Correction of this problem represents a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451.

This change primarily impacts the RCS loop piping modeled in the LBLOCA WCOBRA/TRAC models. It was judged that the effect of this change on the PCT results was negligible, leading to an estimated PCT impact of 0°F.

DECAY HEAT MODEL ERROR CORRECTIONS

The decay heat model in the WCOBRA/TRAC code was updated to correct the erroneously coded value of the yield fraction directly from fission for Group 19 of Pu-239, and to include the term for uncertainty in the prompt energy per fission in the calculation of the decay heat power uncertainty. Correction of these errors represents a closely-related group of Non-Discretionary Changes in accordance with Section 4.1.2 of WCAP-13451.

These changes have a negligible impact on the calculated decay heat power, leading to an estimated PCT impact of 0°F.

CORRECTION TO THE PIPE EXIT PRESSURE DROP ERROR

An error was discovered in WCOBRA/TRAC whereby the frictional pressure drop at the split break TEE connection to the BREAK component was incorrectly calculated using the TEE hydraulic diameter instead of the BREAK component length input. This error has been evaluated for impact on existing analyses and its resolution represents a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451.

Based on the results from a matrix of representative plant calculations, it is concluded that the effect of this error on the pressure at the break and the break flow is negligible, leading to an estimated PCT impact of 0°F.

WCOBRA/TRAC u19 FILE DIMENSION ERROR CORRECTION

A problem was identified in the dimension of an array used to generate the u19 file in WCOBRA/TRAC. The u19 file is read during HSDRIVER execution and provides information needed to generate the HOTSPOT thermal-hydraulic history and user input files. The array used to write the desired information to the u19 file is dimensioned to 2000 in WCOBRA/TRAC. It is possible, however, for more than 2000 curves to be written to the u19 file. If that is the case, it is possible that the curves would not be stored correctly on the u19 file. A survey of current BE LBLOCA analyses indicated that the majority of plants had less than 2000 curves in their u19 files; therefore, these plants are not affected by the change. For those plants with more than 2000 curves, plant-specific sensitivity calculations indicated that resolution of this issue does not impact the PCT calculation for prior analyses. This represents a Discretionary Change in accordance with Section 4.1.1 of WCAP-13451.

As discussed above, resolution of this issue does not impact the PCT calculation for prior LBLOCA analyses, leading to an estimated PCT impact of 0°F.

One of the related WCOBRA/TRAC errors had a non-zero PCT impact. Westinghouse informed Dominion of that error under separate cover.

Revised Heat Transfer Multiplier Distributions

Some of the changes and error corrections described above affect the WCOBRA/TRAC heat transfer models, the heat transfer node initialization, or the heat transfer re-noding logic. This led to an investigation of the heat transfer multiplier distributions using the results for the Separate Effects Tests (SET) and Integral Effects Tests (IETs). During this investigation, errors were discovered in the development of the original multiplier distributions, including errors in the grid locations specified in the WCOBRA/TRAC models for the G2 Refill and G2 Reflood tests, and errors in processing test data used to develop the reflood heat transfer multiplier distribution.

The blowdown, heatup, blowdown cooling, refill, and reflood heat transfer multiplier distributions were redeveloped. The revised heat transfer multiplier distributions have been evaluated for impact on existing analyses. Resolution of these issues represents a closely related group of Non- Discretionary Changes in accordance with Section 4.1.2 of WCAP-13451.

A plant transient calculation representative of Surry transient behavior was performed with the latest version of WCOBRA/TRAC. Using this transient, a matrix

of HOTSPOT calculations was performed to estimate the effect of the heat transfer multiplier distribution changes. The limiting runs for the Surry analysis were identified, including consideration of the thermal conductivity degradation (TCD) effects and other evaluations on the analysis of record (AOR) which substantially impacted the ranking or PCTs of the limiting cases. The set of limiting runs for Surry were selected such that less limiting runs that were not explicitly considered would not become limiting due to the estimated PCT impact from the change in heat transfer multipliers. The heat transfer multipliers for each run were used to identify which bin that multiplier falls into, and an estimated PCT impact for that individual multiplier was assigned. The individual estimated PCT impacts for the run (based on the four multipliers) were summed to estimate the overall impact on the run. Finally, the run results were re-ranked based on the estimated impacts on each run. The change between the estimated 95/95 PCT before and after this process was reported as the estimate of effect for the Surry analysis.

Using these results and considering the heat transfer multiplier uncertainty attributes from limiting cases for Surry Units 1 and 2, an estimated PCT effect of -7°F has been established for 10 CFR 50.46 reporting purposes.

Beyond the WCOBRA/TRAC errors, Westinghouse has informed Dominion of an additional error having a non-zero PCT impact.

HOTSPOT Burst Strain Error Correction

An error in the application of the burst strain was discovered in HOTSPOT. The equation for the application of the burst strain is given as Equation 7-69 in WCAP-16009-P-A and in WCAP-12945-P-A. The outer radius of the cladding after burst occurs should be calculated based on the burst strain, and the inner radius of the cladding should be calculated based on the outer radius. In HOTSPOT, the burst strain is applied to the calculation of the cladding inner radius. The cladding outer radius is then calculated based on the inner radius. As such, the burst strain is incorrectly applied to the inner radius rather than the outer radius, which impacts the resulting cladding geometry at the burst elevation after burst occurs. Correction of the erroneous calculation results in thinner cladding at the burst node and more fuel relocating into the burst node, leading to an increase in the PCT at the burst node. This issue has been evaluated to estimate the impact on existing BE LBLOCA analysis results. The resolution of this issue represents a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451.

The issue described above was evaluated by executing the most limiting plant-specific HOTSPOT runs with a HOTSPOT version that includes the correction of this error. This plant-specific sensitivity study resulted in an estimated PCT impact of 51°F for Surry Units 1 and 2.

Attachment 2

30-DAY REPORTING OF 10 CFR 50.46 MARGIN UTILIZATION

Virginia Electric and Power Company
(Dominion)
Surry Power Station Units 1 and 2

10 CFR 50.46 MARGIN UTILIZATION - WESTINGHOUSE LARGE BREAK LOCA WITH ASTRUM

Plant Name:	Surry Power Station, Unit 1		
Utility Name:	Virginia Electric and Power Company		
Analysis Information			
EM:	ASTRUM (2004)	**Limiting Break Size:**	DEG
Analysis Date:	10/6/2010		
Vendor:	Westinghouse		
FQ:	2.5	**FΔH:**	1.7
Fuel:	Mixed: Upgrade/SIF	**SGTP (%):**	7
Notes:	None		

		Clad Temp (°F)
LICENSING BASIS		
	Analysis of Record PCT	1853
PCT ASSESSMENTS (Delta PCT)		
A.	**Prior ECCS Model Assessments**	
1.	Transition Core (applied to mixed SIF/Upgrade core only)	+14
2.	Evaluation of Fuel Pellet Thermal Conductivity Degradation	+183
3.	Pellet Radial Profile Option	-13
4.	HOTSPOT Burst Temperature Calculation for ZIRLO Cladding	0
5.	Rod Internal Pressure Calculation	0
6.	HOTSPOT Iteration Algorithm for Calculating the Initial Fuel Pellet Average Temperature	0
7.	WCOBRA/TRAC Thermal-Hydraulic History File Dimension used in HSDRIVER Background	0
8.	WCOBRA/TRAC Automated Restart Process Logic Error	0
B.	**Planned Plant Modification Evaluations**	
1.	Evaluation of Additional Containment Metal	0
C.	**2013 ECCS Model Assessments**	
1.	Initial Fuel Pellet Average Temperature Uncertainty Calculation	0
2.	Elevations for Heat Slab Temperature Initialization	0
3.	Heat Transfer Model Error Corrections	0
4.	Correction to Heat Transfer Node Initialization	0
5.	Mass Conservation Error Fix	0
6.	Correction to Split Channel Momentum Equation	0
7.	Heat Transfer Logic Correction for Rod Burst Calculation	0
8.	Changes to Vessel Superheated Steam Properties	0
9.	Update to Metal Density Reference Temperatures	0
10.	Decay Heat Model Error Corrections	0
11.	Correction to the Pipe Exit Pressure Drop Error	0
12.	WCOBRA/TRAC U19 File Dimension Error Correction	0
13.	Revised Heat Transfer Multiplier Distributions	-7

D.	**2014 ECCS Model Assessments**		
	1. HOTSPOT Burst Strain Error Correction		+51
E.	**Other**		
	1. None		0
LICENSING BASIS PCT + PCT ASSESSMENTS		**PCT =**	**2081**

10 CFR 50.46 MARGIN UTILIZATION - WESTINGHOUSE LARGE BREAK LOCA WITH ASTRUM

Plant Name:	Surry Power Station, Unit 2		
Utility Name:	Virginia Electric and Power Company		
Analysis Information			
EM:	ASTRUM (2004)	**Limiting Break Size:**	DEG
Analysis Date:	10/6/2010		
Vendor:	Westinghouse		
FQ:	2.5	**FΔH:**	1.7
Fuel:	Mixed: Upgrade/SIF	**SGTP (%):**	7
Notes:	None		

		Clad Temp (°F)
LICENSING BASIS		
	Analysis of Record PCT	1853
PCT ASSESSMENTS (Delta PCT)		
A.	**Prior ECCS Model Assessments**	
1.	Transition Core (applied to mixed SIF/Upgrade core only)	+14
2.	Evaluation of Fuel Pellet Thermal Conductivity Degradation	+183
3.	Pellet Radial Profile Option	-13
4.	HOTSPOT Burst Temperature Calculation for ZIRLO Cladding	0
5.	Rod Internal Pressure Calculation	0
6.	HOTSPOT Iteration Algorithm for Calculating the Initial Fuel Pellet Average Temperature	0
7.	WCOBRA/TRAC Thermal-Hydraulic History File Dimension used in HSDRIVER Background	0
8.	WCOBRA/TRAC Automated Restart Process Logic Error	0
B.	**Planned Plant Modification Evaluations**	
1.	Evaluation of Additional Containment Metal	0
C.	**2013 ECCS Model Assessments**	
1.	Initial Fuel Pellet Average Temperature Uncertainty Calculation	0
2.	Elevations for Heat Slab Temperature Initialization	0
3.	Heat Transfer Model Error Corrections	0
4.	Correction to Heat Transfer Node Initialization	0
5.	Mass Conservation Error Fix	0
6.	Correction to Split Channel Momentum Equation	0
7.	Heat Transfer Logic Correction for Rod Burst Calculation	0
8.	Changes to Vessel Superheated Steam Properties	0
9.	Update to Metal Density Reference Temperatures	0
10.	Decay Heat Model Error Corrections	0
11.	Correction to the Pipe Exit Pressure Drop Error	0
12.	WCOBRA/TRAC U19 File Dimension Error Correction	0
13.	Revised Heat Transfer Multiplier Distributions	-7

D.	**2014 ECCS Model Assessments**		
	1.	HOTSPOT Burst Strain Error Correction	+51
E.	**Other**		
	1.	None	0
LICENSING BASIS PCT + PCT ASSESSMENTS		**PCT =**	**2081**