Tennessee Valley Authority, 1101 Market Street, Chattanooga, Tennessee 37402

April 25, 2012

10 CFR 50.4
10 CFR 50.46

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Watts Bar Nuclear Plant, Unit 1
Facility Operating License No. NPF-90
NRC Docket No. 50-390

Subject: **10 CFR 50.46 Annual Report for Model Year 2011**

Reference: TVA letter to NRC dated April 27, 2011, "10 CFR 50.46 Annual Report for Model Year 2010"

The purpose of this letter is to provide the annual report of changes or errors discovered in the emergency core cooling system (ECCS) evaluation model for Watts Bar Nuclear Plant, Unit 1. In accordance with 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems (ECCS) for Light-Water Nuclear Power Reactors," paragraph (a)(3)(ii), the enclosed report describes the nature and the estimated effect on the limiting ECCS analysis of changes or errors discovered since submittal of the reference letter.

There are no regulatory commitments in this letter. Please direct questions concerning this issue to Robert Clark, Senior Licensing Engineer at (423) 365-1818.

Respectfully,

J. W. Shea

Enclosure:

10 CFR 50.46 Annual Report

cc page 2

A002
NRR

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cc (Enclosure):
NRC Regional Administrator – Region II
NRC Senior Resident Inspector – Watts Bar Nuclear Plant
Division of Radiological Health - State of Tennessee

1. LOTIC2 ERROR CORRECTIONS (Non-Discretionary Changes)

Background

Errors were discovered and corrected in the LOTIC2 code, which calculates the minimum containment pressure transient for a Large Break Loss-of-Coolant Accident (LOCA) analysis of a plant with an ice condenser containment design. The calculation of the initial specific internal energy of air in the dead ended compartment was corrected to use the appropriate reference temperature, and three calculations of the specific volume of air were corrected to remove a small, extraneous term that was apparently intended to prevent division by zero when there was no air in a given compartment. These changes represent Non-Discretionary Changes in accordance with Section 4.1.2 of WCAP-13451.

Affected Evaluation Model(s)

1981 Westinghouse Large Break LOCA Evaluation Model with BASH
1996 Westinghouse Best Estimate Large Break LOCA Evaluation Model
2004 Westinghouse Realistic Large Break LOCA Evaluation Model Using ASTRUM

Estimated Effect

Sensitivity calculations showed that correcting the errors had either no effect or a negligible effect on the lower compartment pressure transient, leading to an estimated Peak Cladding Temperature (PCT) impact of 0°F.

2. RADIATION HEAT TRANSFER LOGIC (Non-Discretionary Changes)

Background

Two errors were discovered in the calculation of the radiation heat transfer coefficient in the SBLOCTA computer code. First, existing diagnostics did not preclude non-physical negative or large (negative or positive) radiation heat transfer coefficients from being calculated. These calculations occurred when the vapor temperature exceeded the cladding surface temperature or when the predicted temperature difference was less than 1 degree. Second, a temperature term incorrectly used degrees Fahrenheit instead of Rankine. These errors have been corrected in the SBLOCTA code and represent a closely related group of Non-Discretionary Changes in accordance with Section 4.1.2 of WCAP-13451.

Affected Evaluation Model(s)

1985 Westinghouse Small Break LOCA Evaluation Model with NOTRUMP

Estimated Effect

A combination of SBLOCTA sensitivity calculations and engineering judgment led to an estimated PCT effect of 0°F for existing Small Break LOCA analysis results.

3. MAXIMUM FUEL ROD TIME STEP LOGIC (Non-Discretionary Changes)

Background

An error was discovered in the SBLOCTA code that allowed the fuel rod time step to exceed the specified maximum allowable time step. The time step logic has been corrected in the SBLOCTA code. This change represents a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451.

Affected Evaluation Model(s)

1985 Westinghouse Small Break LOCA Evaluation Model with NOTRUMP

Estimated Effect

A combination of SBLOCTA sensitivity calculations and engineering judgment led to an estimated PCT effect of 0°F for existing Small Break LOCA analysis results.

4. GENERAL CODE MAINTENANCE (Discretionary Change)

Background

Various changes have been made to enhance the usability of the codes and to streamline future analyses. Example of these changes include modifying input variable definitions; units and defaults; improving the input diagnostic checks; enhancing the code output; optimizing active coding; and eliminating inactive coding. These changes represent Discretionary Changes that will be implemented on a forward fit basis in accordance with Section 4.1.1 of WCAP-13451.

Affected Evaluation Model(s)

1985 Westinghouse Small Break LOCA Evaluation Model with NOTRUMP
1996 Westinghouse Best Estimate Large Break LOCA Evaluation Model
1999 Westinghouse Realistic Large Break LOCA Evaluation Model, Application to PWRs with Upper Plenum Injection
2004 Westinghouse Realistic Large Break LOCA Evaluation Model using ASTRUM

Estimated Effect

The nature of these changes leads to an estimated PCT impact of 0°F.

5. WAT CYCLE 11 PBOT/PMID VIOLATION (Discretionary Change)

Background

The Watts Bar Unit 1 Cycle 11 reload core design resulted in violations for the PBOT/PMID limit used in the Large Break LOCA Analysis. These violations were evaluated for Watts Bar Unit 1 Cycle 11 operation. This change represents a Discretionary Change in accordance with Section 4.1.2 of WCAP-13451.

Affected Evaluation Model(s)

1996 Westinghouse Best Estimate Large Break LOCA Evaluation Model

Estimated Effect

The impact of the PBOT/PMID violation for Watts Bar Unit 1 Cycle 11 was determined via a plant-specific evaluation to be 20°F for Reflood 1 and Reflood 2.

6. Reference

1. WAT-D-11948, "Tennessee Valley Authority Watts Bar Nuclear Plant Units 1 & 2 10 CFR 50.56 Annual Notification and Reporting for 2011," March 2012.

Westinghouse LOCA Peak Clad Temperature Summary for Best Estimate Large Break

Plant Name: Watts Bar Unit 1
Utility Name: Tennessee Valley Authority
Revision Date: 2/23/2012

Cycle 10, RSG Reflood 1

Analysis Information

EM: CQD (1996) **Analysis Date:** 8/1/1998 **Limiting Break Size:** Guillotine
FQ: 2.5 **FdH:** 1.65
Fuel: Vantage + **SGTP (%):** 12
Notes: Mixed Core - Vantage + / Performance + / RFA-2

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	1656	1, 2	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1. Vessel Channel DX Error	56	3	
2. MONTECF Decay Heat Uncertainty Error	4	6	
3. Input Error Resulting in Incomplete Solution Matrix	60	7	
4. Tavg Bias Error	8	7	
5. Revised Blowdown Heatup Uncertainty Distribution	5	8	
6. HOTSPOT Fuel Relocation Error	0	11	
7. Accumulator Line/Pressurizer Surge Line Data Evaluation	-37	5	
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1. Increased Accumulator Temperature Range Evaluation	4	5	
2. 1.4% Uprate Evaluation	12	5	
3. Increased Stroke Time for the ECCS Valves	0	9	
4. Replacement Steam Generators (D3 to 68AXP)	-50	10	
5. PMID Violation Evaluation	20	12	
C. 2010 ECCS MODEL ASSESSMENTS			
1. None	0		
D. OTHER			
1. None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT =** 1738		

References:

1. WCAP-14839, Rev. 1, "Best Estimate Analysis of the Large Break Loss of Coolant Accident for the Watts Bar Nuclear Plant," September 1998.

2. WAT-D-10499, "Tennessee Valley Authority Watts Bar Nuclear Plant Units 1 and 2, 10 CFR 50.46 Annual Notification and Reporting for 1997," February 27, 1998.

Plant Name: Watts Bar Unit 1
Utility Name: Tennessee Valley Authority

Cycle 10, RSG

Revision Date: 2/23/2012

Reflood 1

References (Continued):

3. WAT-D-10618,"Tennessee Valley Authority, Watts Bar Nuclear Plant Units 1 and 2, 10 CFR 50.46 Annual Notification and Reporting for 1998," March 5, 1999.

4. WAT-D-10725,"Tennessee Valley Authority, Watts Bar Nuclear Plant Unit 1, 10 CFR 50.46 Annual Notification and Reporting for 1999," February 23, 2000.

5. WAT-D-10840, "Tennessee Valley Authority, Watts Bar Nuclear Plant Unit 1, Final Deliverables for 1.4% Uprate Program," August 31, 2000.

6. WAT-D-10904, "10 CFR 50.46 Annual Notification and Reporting for 2000," February 2001.

7. WAT-D-11225, "10 CFR 50.46 Annual Notification and Reporting for 2003," March 2004.

8. WAT-D-11334, "10 CFR 50.46 Annual Notification and Reporting for 2004," April 2005.

9 WAT-D-11285, "Evaluation of Proposed Changes to the Stroke Time for the ECCS Valves," November 2004.

10. WTV-RSG-06-015, "LOCA & Non-LOCA Analysis Summary for Replacement Steam Generator," February 2006.

11. LTR-LIS-07-378, "10 CFR 50.46 Reporting Text for HOTSPOT Fuel Relocation Error and Revised PCT Rackup Sheets for Watts Bar Unit 1," June 2007.

12. LTR-LIS-10-118, "10 CFR 50.46 Reporting Text for Watts Bar Unit 1 Cycle 10 RSAC PMID Violation Evaluation and Revised PCT Rackup Sheets," February 2010.

Notes:

None

Westinghouse LOCA Peak Clad Temperature Summary for Best Estimate Large Break

Plant Name: Watts Bar Unit 1
Utility Name: Tennessee Valley Authority

Cycle 10, RSG

Revision Date: 2/23/2012

Reflood 2

Analysis Information

EM: CQD (1996) **Analysis Date:** 8/1/1998 **Limiting Break Size:** Guillotine
FQ: 2.5 **FdH:** 1.65
Fuel: Vantage + **SGTP (%):** 12
Notes: Mixed Core - Vantage + / Performance + / RFA-2

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	1892	1, 2	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1. Vessel Channel DX Error	-4	3	
2. MONTECF Decay Heat Uncertainty Error	4	6	
3. Input Error Resulting in Incomplete Solution Matrix	0	7	
4. Tavg Bias Error	8	7	
5 Revised Blowdown Heatup Uncertainty Distribution	5	8	
6. HOTSPOT Fuel Relocation Error	65	11	
7. Accumulator Line/Pressurizer Surge Line Data Evaluation	-131	4	
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1. Increased Accumulator Temperature Range Evaluation	4	5	
2. 1.4% Uprate Evaluation	12	5	
3. Increased Stroke Time for the ECCS Valves	0	9	
4. Replacement Steam Generators (D3 to 68AXP)	-10	10	
5. PMID Violation Evaluation	20	12	
C. 2010 ECCS MODEL ASSESSMENTS			
1. None	0		
D. OTHER			
1. None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT** = 1865		

References:

1. WCAP-14839, Rev. 1, "Best Estimate Analysis of the Large Break Loss of Coolant Accident for the Watts Bar Nuclear Plant," September 1998.

2. WAT-D-10499, "Tennessee Valley Authority Watts Bar Nuclear Plant Units 1 and 2, 10 CFR 50.46 Annual Notification and Reporting for 1997," February 27, 1998.

Plant Name: Watts Bar Unit 1
Utility Name: Tennessee Valley Authority

Revision Date: 2/23/2012

Cycle 10, RSG

Reflood 2

References (Continued):

3. WAT-D-10618,"Tennessee Valley Authority, Watts Bar Nuclear Plant Units 1 and 2, 10 CFR 50.46 Annual Notification and Reporting for 1998," March 5, 1999.

4. WAT-D-10725,"Tennessee Valley Authority, Watts Bar Nuclear Plant Unit 1, 10 CFR 50.46 Annual Notification and Reporting for 1999," February 23, 2000.

5. WAT-D-10840, "Tennessee Valley Authority, Watts Bar Nuclear Plant Unit 1, Final Deliverables for 1.4% Uprate Program," August 31, 2000.

6. WAT-D-10904, "10 CFR 50.46 Annual Notification and Reporting for 2000," February 2001.

7. WAT-D-11225, "10 CFR 50.46 Annual Notification and Reporting for 2003," March 2004.

8. WAT-D-11334, "10 CFR 50.46 Annual Notification and Reporting for 2004," April 2005.

9. WAT-D-11285, "Evaluation of Proposed Changes to the Stroke Time for the ECCS Valves," November 2004.

10. WTV-RSG-06-015, "LOCA & Non-LOCA Analysis Summary for Replacement Steam Generator," February 2006.

11. LTR-LIS-07-378, "10 CFR 50.46 Reporting Text for HOTSPOT Fuel Relocation Error and Revised PCT Rackup Sheets for Watts Bar Unit 1," June 2007.

12. LTR-LIS-10-118, "10 CFR 50.46 Reporting Text for Watts Bar Unit 1 Cycle 10 RSAC PMID Violation Evaluation and Revised PCT Rackup Sheets," February 2010.

Notes:

None

Westinghouse LOCA Peak Clad Temperature Summary for Best Estimate Large Break

Plant Name: Watts Bar Unit 1
Utility Name: Tennessee Valley Authority

Cycle 10, RSG Composite

Revision Date: 2/23/2012

Analysis Information

EM: CQD (1996) **Analysis Date:** 8/1/1998 **Limiting Break Size:** Guillotine
FQ: 2.5 **FdH:** 1.65
Fuel: Vantage + **SGTP (%):** 12
Notes: Mixed Core - Vantage + / Performance + / RFA-2

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	1892	1, 2	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1. Vessel Channel DX Error	-4	3	
2. MONTECF Decay Heat Uncertainty Error	4	6	
3. Input Error Resulting in Incomplete Solution Matrix	0	7	
4. Tavg Bias Error	8	7	
5 Revised Blowdown Heatup Uncertainty Distribution	5	8	
6. HOTSPOT Fuel Relocation Error	65	11	
7. Accumulator Line/Pressurizer Surge Line Data Evaluation	-131	4	
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1. Increased Accumulator Temperature Range Evaluation	4	5	
2. 1.4% Uprate Evaluation	12	5	
3. Increased Stroke Time for the ECCS Valves	0	9	
4. Replacement Steam Generators (D3 to 68AXP)	-10	10	
5. PMID Violation Evaluation	20	12	
C. 2010 ECCS MODEL ASSESSMENTS			
1. None	0		
D. OTHER			
1. None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT =** 1865		

References:

1. WCAP-14839, Rev. 1, "Best Estimate Analysis of the Large Break Loss of Coolant Accident for the Watts Bar Nuclear Plant," September 1998.

2. WAT-D-10499, "Tennessee Valley Authority Watts Bar Nuclear Plant Units 1 and 2,10 CFR 50.46 Annual Notification and Reporting for 1997," February 27, 1998.

Plant Name: Watts Bar Unit 1
Utility Name: Tennessee Valley Authority

Cycle 10, RSG Composite

Revision Date: 2/23/2012

References (Continued):

3. WAT-D-10618,"Tennessee Valley Authority, Watts Bar Nuclear Plant Units 1 and 2, 10 CFR 50.46 Annual Notification and Reporting for 1998," March 5, 1999.

4. WAT-D-10725,"Tennessee Valley Authority, Watts Bar Nuclear Plant Unit 1, 10 CFR 50.46 Annual Notification and Reporting for 1999," February 23, 2000.

5, WAT-D-10840, "Tennessee Valley Authority, Watts Bar Nuclear Plant Unit 1, Final Deliverables for 1.4% Uprate Program," August 31, 2000.

6. WAT-D-10904, "10 CFR 50.46 Annual Notification and Reporting for 2000," March 2001.

7. WAT-D-11225, "10 CFR 50.46 Annual Notification and Reporting for 2003," March 2004.

8. WAT-D-11334, "10 CFR 50.46 Annual Notification and Reporting for 2004," April 2005.

9. WAT-D-11285, "Evaluation of Proposed Changes to the Stroke Time for the ECCS Valves," November 2004.

10. WTV-RSG-06-015, "LOCA & Non-LOCA Analysis Summary for Replacement Steam Generator," February 2006.

11. LTR-LIS-07-378, "10 CFR 50.46 Reporting Text for HOTSPOT Fuel Relocation Error and Revised PCT Rackup Sheets for Watts Bar Unit 1," June 2007.

12. LTR-LIS-10-118, "10 CFR 50.46 Reporting Text for Watts Bar Unit 1 Cycle 10 RSAC PMID Violation Evaluation and Revised PCT Rackup Sheets," February 2010.

Notes:

None

Westinghouse LOCA Peak Clad Temperature Summary for Best Estimate Large Break

Plant Name: Watts Bar Unit 1
Utility Name: Tennessee Valley Authority

Cycle 11, RSG

Revision Date: 2/23/2012

Reflood 1

Analysis Information

EM: CQD (1996) **Analysis Date:** 8/1/1998 **Limiting Break Size:** Guillotine
FQ: 2.5 **FdH:** 1.65
Fuel: Vantage + **SGTP (%):** 12
Notes: Mixed Core - Vantage + / Performance + / RFA-2

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	1656	1, 2	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1. Vessel Channel DX Error	56	3	
2. MONTECF Decay Heat Uncertainty Error	4	6	
3. Input Error Resulting in Incomplete Solution Matrix	60	7	
4. Tavg Bias Error	8	7	
5. Revised Blowdown Heatup Uncertainty Distribution	5	8	
6. HOTSPOT Fuel Relocation Error	0	11	
7. Accumulator Line/Pressurizer Surge Line Data Evaluation	-37	5	
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1. Increased Accumulator Temperature Range Evaluation	4	5	
2. 1.4% Uprate Evaluation	12	5	
3. Increased Stroke Time for the ECCS Valves	0	9	
4. Replacement Steam Generators (D3 to 68AXP)	-50	10	
5. PMID Violation Evaluation	20	12	
C. 2010 ECCS MODEL ASSESSMENTS			
1. None	0		
D. OTHER			
1. None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT** = 1738		

References:

1. WCAP-14839, Rev. 1, "Best Estimate Analysis of the Large Break Loss of Coolant Accident for the Watts Bar Nuclear Plant," September 1998.

2. WAT-D-10499, "Tennessee Valley Authority Watts Bar Nuclear Plant Units 1 and 2, 10 CFR 50.46 Annual Notification and Reporting for 1997," February 27, 1998.

Plant Name: Watts Bar Unit 1
Utility Name: Tennessee Valley Authority

Cycle 11, RSG

Revision Date: 2/23/2012

Reflood 1

References (Continued):

3. WAT-D-10618,"Tennessee Valley Authority, Watts Bar Nuclear Plant Units 1 and 2, 10 CFR 50.46 Annual Notification and Reporting for 1998," March 5, 1999.

4. WAT-D-10725,"Tennessee Valley Authority, Watts Bar Nuclear Plant Unit 1, 10 CFR 50.46 Annual Notification and Reporting for 1999," February 23, 2000.

5. WAT-D-10840, "Tennessee Valley Authority, Watts Bar Nuclear Plant Unit 1, Final Deliverables for 1.4% Uprate Program," August 31, 2000.

6. WAT-D-10904, "10 CFR 50.46 Annual Notification and Reporting for 2000," March 2001.

7. WAT-D-11225, "10 CFR 50.46 Annual Notification and Reporting for 2003," March 2004.

8. WAT-D-11334, "10 CFR 50.46 Annual Notification and Reporting for 2004," April 2005.

9. WAT-D-11285, "Evaluation of Proposed Changes to the Stroke Time for the ECCS Valves," November 2004.

10. WTV-RSG-06-015, "LOCA & Non-LOCA Analysis Summary for Replacement Steam Generator," February 2006.

11. LTR-LIS-07-378, "10 CFR 50.46 Reporting Text for HOTSPOT Fuel Relocation Error and Revised PCT Rackup Sheets for Watts Bar Unit 1," June 2007.

12. LTR-LIS-11-212, "10 CFR 50.46 Report for the Watts Bar Unit 1 RSCA PBOT/PMID Violation Evaluation and Removal of Temporary Condition Penalties," March 2011.

Notes:

None

Westinghouse LOCA Peak Clad Temperature Summary for Best Estimate Large Break

Plant Name: Watts Bar Unit 1
Utility Name: Tennessee Valley Authority

Cycle 11, RSG

Revision Date: 2/23/2012

Reflood 2

Analysis Information

EM: CQD (1996) **Analysis Date:** 8/1/1998 **Limiting Break Size:** Guillotine
FQ: 2.5 **FdH:** 1.65
Fuel: Vantage + **SGTP (%):** 12
Notes: Mixed Core - Vantage + / Performance + / RFA-2

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	1892	1, 2	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1. Vessel Channel DX Error	-4	3	
2. MONTECF Decay Heat Uncertainty Error	4	6	
3. Input Error Resulting in Incomplete Solution Matrix	0	7	
4. Tavg Bias Error	8	7	
5. Revised Blowdown Heatup Uncertainty Distribution	5	8	
6. HOTSPOT Fuel Relocation Error	65	11	
7. Accumulator Line/Pressurizer Surge Line Data Evaluation	-131	4	
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1. Increased Accumulator Temperature Range Evaluation	4	5	
2. 1.4% Uprate Evaluation	12	5	
3. Increased Stroke Time for the ECCS Valves	0	9	
4. Replacement Steam Generators (D3 to 68AXP)	-10	10	
5. PBOT/PMIT Violation Evaluation	20	12	
C. 2011 ECCS MODEL ASSESSMENTS			
1. None	0		
D. OTHER			
1. None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT** = 1865		

References:

1. WCAP-14839, Rev. 1, "Best Estimate Analysis of the Large Break Loss of Coolant Accident for the Watts Bar Nuclear Plant," September 1998.

2. WAT-D-10499, "Tennessee Valley Authority Watts Bar Nuclear Plant Units 1 and 2, 10 CFR 50.46 Annual Notification and Reporting for 1997," February 27, 1998.

Plant Name: Watts Bar Unit 1
Utility Name: Tennessee Valley Authority

Revision Date: 2/23/2012

Cycle 11, RSG

Reflood 2

References (Continued):

3. WAT-D-10618,"Tennessee Valley Authority, Watts Bar Nuclear Plant Units 1 and 2, 10 CFR 50.46 Annual Notification and Reporting for 1998," March 5, 1999.

4. WAT-D-10725,"Tennessee Valley Authority, Watts Bar Nuclear Plant Unit 1, 10 CFR 50.46 Annual Notification and Reporting for 1999," February 23, 2000.

5. WAT-D-10840, "Tennessee Valley Authority, Watts Bar Nuclear Plant Unit 1, Final Deliverables for 1.4% Uprate Program," August 31, 2000.

6. WAT-D-10904, "10 CFR 50.46 Annual Notification and Reporting for 2000," March 2001.

7. WAT-D-11225, "10 CFR 50.46 Annual Notification and Reporting for 2003," March 2004.

8. WAT-D-11334, "10 CFR 50.46 Annual Notification and Reporting for 2004," April 2005.

9. WAT-D-11285, "Evaluation of Proposed Changes to the Stroke Time for the ECCS Valves," November 2004.

10. WTV-RSG-06-015, "LOCA & Non-LOCA Analysis Summary for Replacement Steam Generator," February 2006.

11. LTR-LIS-07-378, "10 CFR 50.46 Reporting Text for HOTSPOT Fuel Relocation Error and Revised PCT Rackup Sheets for Watts Bar Unit 1," June 2007.

12. LTR-LIS-11-212, "10 CFR 50.46 Report for the Watts Bar Unit 1 RSAC PBOT/PMID Violation Evaluation and Removal of Temporary Condition Penalties," March 2011.

Notes:

None

Westinghouse LOCA Peak Clad Temperature Summary for Best Estimate Large Break

Plant Name: Watts Bar Unit 1
Utility Name: Tennessee Valley Authority

Cycle 11, RSG Composite

Revision Date: 2/23/2012

Analysis Information

EM: CQD (1996) **Analysis Date:** 8/1/1998 **Limiting Break Size:** Guillotine
FQ: 2.5 **FdH:** 1.65
Fuel: Vantage + **SGTP (%):** 12

Notes: Mixed Core - Vantage+ / Performance+ / RFA-2

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	1892	1, 2	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1. Vessel Channel DX Error	-4	3	
2. MONTECF Decay Heat Uncertainty Error	4	6	
3. Input Error Resulting in Incomplete Solution Matrix	0	7	
4. Tavg Bias Error	8	7	
5. Revised Blowdown Heatup Uncertainty Distribution	5	8	
6. HOTSPOT Fuel Relocation Error	65	11	
7. Accumulator Line/Pressurizer Surge Line Data Evaluation	-131	4	
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1. Increased Accumulator Temperature Range Evaluation	4	5	
2. 1.4% Uprate Evaluation	12	5	
3. Increased Stroke Time for the ECCS Valves	0	9	
4. Replacement Steam Generators (D3 to 68AXP)	-10	10	
5. PMID Violation Evaluation	20	12	
C. 2010 ECCS MODEL ASSESSMENTS			
1. None	0		
D. OTHER			
1. None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT** = 1865		

References:

1. WCAP-14839, Rev. 1, "Best Estimate Analysis of the Large Break Loss of Coolant Accident for the Watts Bar Nuclear Plant," September 1998.

2. WAT-D-10499, "Tennessee Valley Authority Watts Bar Nuclear Plant Units 1 and 2, 10 CFR 50.46 Annual Notification and Reporting for 1997," February 27, 1998.

Plant Name: Watts Bar Unit 1
Utility Name: Tennessee Valley Authority

Revision Date: 2/23/2012

Cycle 11, RSG Composite

References (Continued):

3. WAT-D-10618,"Tennessee Valley Authority, Watts Bar Nuclear Plant Units 1 and 2, 10 CFR 50.46 Annual Notification and Reporting for 1998," March 5, 1999.
4. WAT-D-10725,"Tennessee Valley Authority, Watts Bar Nuclear Plant Unit 1, 10 CFR 50.46 Annual Notification and Reporting for 1999," February 23, 2000.
5. WAT-D-10840, "Tennessee Valley Authority, Watts Bar Nuclear Plant Unit 1, Final Deliverables for 1.4% Uprate Program," August 31, 2000.
6. WAT-D-10904, "10 CFR 50.46 Annual Notification and Reporting for 2000," March 2001.
7. WAT-D-11225, "10 CFR 50.46 Annual Notification and Reporting for 2003," March 2004.
8. WAT-D-11334, "10 CFR 50.46 Annual Notification and Reporting for 2004," April 2005.
9. WAT-D-11285, "Evaluation of Proposed Changes to the Stroke Time for the ECCS Valves," November 2004.
10. WTV-RSG-06-015, "LOCA & Non-LOCA Analysis Summary for Replacement Steam Generator," February 2006.
11. LTR-LIS-07-378, "10 CFR 50.46 Reporting Text for HOTSPOT Fuel Relocation Error and Revised PCT Rackup Sheets for Watts Bar Unit 1," June 2007.
12. LTR-LIS-11-212, "10 CFR 50.46 Report for Watts Bar Unit 1 RSAC PBOT/PMID Violation Evaluation and Removal of Temporary Condition Penalties," March 2011.

Notes:

None

Westinghouse LOCA Peak Clad Temperature Summary for Appendix K Small Break

Plant Name: Watts Bar Unit 1 **RSG**
Utility Name: Tennessee Valley Authority

Revision Date: 2/23/2012

Analysis Information

EM:	NOTRUMP	**Analysis Date:**	5/17/2004	**Limiting Break Size:**	4 inch
FQ:	2.5	**FdH:**	1.65		
Fuel:	RFA-2	**SGTP (%):**	12		

Notes: Mixed Core - Vantage + / Performance + / RFA-2

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	1132	1	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1. None	0		
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1. Increased Stroke Time for the ECCS Valves	0	2	
C. 2011 ECCS MODEL ASSESSMENTS			
1. None	0		
D. OTHER			
1. None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT** = 1132		

References:

1. WTV-RSG-06-015, "LOCA & Non-LOCA Analysis Summary for Replacement Steam Generator," February 2006.

2. WAT-D-11285, "Evaluation of Proposed Changes to the Stroke Time for the ECCS Valves," November 2004.

Notes:

None