



Tennessee Valley Authority, Post Office Box 2000, Spring City, Tennessee 37381-2000

AUG 16 2005

10 CFR 50.46

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

In the Matter of the) Docket No. 50-390
Tennessee Valley Authority)

WATTS BAR NUCLEAR PLANT (WBN) UNIT 1 - EMERGENCY CORE
COOLING SYSTEM (ECCS) EVALUATION MODEL CHANGES - 30 DAY
REPORT - 10 CFR 50.46 NOTIFICATION

References:

1. TVA Letter to NRC, February 21, 2003, "WBN Unit 1 -
Emergency Core Cooling System (ECCS) Evaluation Model
changes - 30 Day Report.
2. TVA Letter to NRC, April 19, 2005, "WBN Unit 1 -
Emergency Core Cooling System (ECCS) Evaluation Model
Changes - Annual Notification and Reporting for 2004"
3. Westinghouse letter to TVA (WAT-D-11364), August 4,
2005, "Watts Bar Nuclear Plant, "LOCA Peak Clad
temperature Summary for Small Break"

The purpose of this letter is notify the NRC of a change in the WBN ECCS evaluation models for peak cladding temperature (PCT) in accordance with 10 CFR 50.46 related to a temporary change of more than 50 degrees F in calculated PCT. As reported by Westinghouse in Reference 3, this temporary change to WBN's ECCS evaluation model affects the small break LOCA (SBLOCA) analysis, and is described in Enclosure 1. The PCT margin allocation resulting from this change is summarized in Enclosure 2.

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As discussed in Enclosure 1, TVA has experienced a repeat condition (Reference 1) involving apparent leakage when running the Watts Bar Unit 1 Safety Injection (SI) pumps which could result in diverting some SI flow to the pressurizer relief tank (PRT). TVA had previously taken measures to identify and correct this situation, including evaluation and replacement/refurbishment of SIS piping relief valves during the Unit 1 Cycle 5 refueling outage. Following this valve replacement, no leakage was identified until a repeat occurrence on July 17, 2005. TVA has decided to conservatively treat this event as a recurrence of the condition and is performing additional cause determinations. TVA requested Westinghouse to evaluate the impact of this condition. Their evaluation results, Reference 3, were received by TVA on August 4, 2005, and concluded that there will be sufficient flow to meet the requirements of the safety analyses. Westinghouse evaluated the SI flow reduction for its impact on SBLOCA and BELOCA. As a result, a temporary PCT penalty of 120 degrees F has been assessed on SBLOCA for the reduction in SI flow. This penalty has been added to the PCT Summary Sheet in Enclosure 2 and is expected to remain in place for the duration of the current operating cycle (Cycle 7). As shown in the summary sheet, the inclusion of this penalty results in a PCT of 1305 degrees F which is considerably less than the 2200 degrees F regulatory limit. There was no impact associated with the limiting PCT for BELOCA.

The temporary PCT assessment of 120°F for SBLOCA exceeds the threshold defined in 10 CFR 50.46(a)(3)(i) for a change of more than 50°F in calculated PCT. Therefore, TVA is reporting this change within the 30-day time limit specified in 10 CFR 50.46. In accordance with 10 CFR 50.46(a)(3)(ii), TVA is required to provide a proposed schedule for providing a reanalysis or taking other actions needed to show compliance with 50.46 requirements for the changes or errors discussed above. As a result of the temporary nature of the PCT assessment due to a hardware condition, and based on the acceptable evaluation results described herein, the WBN SBLOCA ECCS Model for the current cycle satisfies and complies with the 10 CFR 50.46 acceptance criteria.

Accordingly, TVA has completed the analysis required of 10 CFR 50.46 for changes or errors in an ECCS model and no further action is currently required. Because the SBLOCA change is a temporary condition which will be moot after the correction of the safety injection flow deficiency, TVA does not consider it will be necessary to make a 30-day report regarding the negative 120°F PCT change (increasing margin) that will occur when WBN reverts back to the previous SBLOCA model.

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There are no regulatory commitments in this letter. Should there be questions regarding the information provided in this letter, please call me at (423) 365-1824.

Sincerely,



P. E. Pace
Manager, Site Licensing
and Industry Affairs

Enclosures

1. Description of Change which affects WBN's Emergency Core Cooling System Evaluation Model(s) and its Calculation of Peak Cladding Temperature
2. Summary of Peak Cladding Temperature Margin Allocations Resulting from Change to the Emergency Core Cooling System Evaluation Model

cc: See Page 4

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PLP:

Enclosures

cc (Enclosures)

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ENCLOSURE 1

DESCRIPTION OF CHANGE WHICH AFFECTS WBN'S EMERGENCY CORE COOLING SYSTEM EVALUATION MODEL(S) AND ITS CALCULATION OF PEAK CLADDING TEMPERATURE

1. Evaluation of Temporary Safety Injection Leakage to Pressurizer Relief Tank (PRT)

Background

Westinghouse was informed by TVA of an apparent leak when running the Safety Injection (SI) pumps in Watts Bar Unit 1 which could result in a loss of up to 30 gpm SI flow to the pressurizer relief tank (PRT). TVA requested Westinghouse to evaluate the impact of this condition. Based on the following evaluations, Westinghouse concluded that the SI shortfall can be accommodated by the amount of margin available and/or the lack of sensitivity to the SI flow volume in the various design basis analyses, and the pump performance will not be degraded and there will be sufficient flow to meet the requirements of the safety analyses. This conclusion is valid for the duration of the current operating cycle (Cycle 7) and is not intended to support a permanent reduction in SI flow. In particular, the evaluations did account for the presence of Tritium Producing Burnable Absorber Rods in current cycle.

Affected Evaluation Models

1. 1985 Westinghouse Small Break LOCA Evaluation Model with NOTRUMP
2. 1996 Westinghouse Best Estimate Large Break LOCA Evaluation Model

Estimated Effect

SBLOCA

The 30 gpm SI flow reduction was evaluated for its impact on small break LOCA (SBLOCA). The impact was evaluated based on the SBLOCA analysis of record (References 1 and 2). The most recent small break LOCA PCT summary sheet was transmitted via Reference 3. A PCT penalty of 120 degrees F has been assessed for the reduction in SI flow. This penalty, which has been added to the PCT Summary Sheet provided in Enclosure 2, is expected to remain in place for the duration of the current operating cycle (Cycle 7). As shown in the summary sheet, the inclusion of this penalty results in a PCT of 1305 degrees F which is considerably less than the 2200 degrees F regulatory limit.

Best Estimate LBLOCA (BELOCA)

The BELOCA analysis for Watts Bar was evaluated for the impact of the reduction in SI flow. It was determined that the 30 gpm reduction results in a total integrated SI flow reduction of 3.36 percent. Based on a calculation documented in Reference 4, which reduced overall SI flow by 10 percent, it is concluded that the 30 gpm SI flow reduction has no effect on the limiting PCT for the BELOCA.

References

1. WAT-D-10337, "Tennessee Valley Authority, Watts Bar Nuclear Plant, Final Safety Evaluation to Support Technical Specification Changes," March 5, 1997.
2. WAT-D-10356, "Tennessee Valley Authority, Watts Bar Nuclear Plant Units 1 & 2, Final Report and Safety Evaluation for 10% SGTP Program," June 2, 1997.
3. Westinghouse letter to TVA (WAT-D-11364), August 4, 2005, "Watts Bar Nuclear Plant, "LOCA Peak Clad temperature Summary for Small Break."
4. WCAP-14839, "Best Estimate Analysis of the Large Break Loss of Coolant Accident for the Watts Bar Nuclear Plant," July 1997.

ENCLOSURE 2

SUMMARY OF PEAK CLADDING TEMPERATURE MARGIN ALLOCATIONS
RESULTING FROM CHANGE TO THE EMERGENCY CORE COOLING SYSTEM
EVALUATION MODEL

Westinghouse LOCA Peak Clad Temperature Summary for Small Break

Plant Name: Watts Bar Unit 1
 Utility Name: Tennessee Valley Authority
 Revision Date: 7/26/05

Analysis Information

EM: NOTRUMP Analysis Date: 11/1/96 Limiting Break Size: 4 inch
 FQ: 2.5 FdH: 1.65
 Fuel: Vantage + SGTP (%): 10
 Notes: Mixed Core - Vantage + / Performance - / RFA-2

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	1126	1,2	
MARGIN ALLOCATIONS (Delta PCT)			
A. PRIOR PERMANENT ECCS MODEL ASSESSMENTS			
1 . NOTRUMP Mixture Level Tracking / Region Depletion Errors	13	4	
2 . NOTRUMP Bubble Rise / Drift Flux Model Inconsistency Corrections	35	5	
B. PLANNED PLANT CHANGE EVALUATIONS			
1 . Annular Blankets	10	3	
2 . Increased Stroke Time for the ECCS Valves	0	6	
C. 2005 PERMANENT ECCS MODEL ASSESSMENTS			
1 . None	0		
D. TEMPORARY ECCS MODEL ISSUES*			
1 . Leaking SIS Relief Valve	120	7	
E. OTHER			
1 . Avg Uncertainty of 6 °F	1		
LICENSING BASIS PCT + MARGIN ALLOCATIONS	PCT =	1305	

* It is recommended that these temporary PCT allocations which address current LOCA model issues not be considered with respect to 10 CFR 50.46 reporting requirements.

References:

- 1 . WAT-D-10337. "Tennessee Valley Authority, Watts Bar Nuclear Plant, Final Safety Evaluation to Support Technical Specification Changes," March 5, 1997.
- 2 . WAT-D-10356, "Tennessee Valley Authority, Watts Bar Nuclear Plant Units 1 & 2, Final Report and Safety Evaluation for the 10% SGTP Program," June 2, 1997.
- 3 . WAT-D-10618. "Tennessee Valley Authority, Watts Bar Nuclear Plant Unit 1, 10 CFR 50.46 Annual Notification and Reporting for 1998," March 5, 1999.
- 4 . WAT-D-10810. "Tennessee Valley Authority, Watts Bar Nuclear Plant Unit 1, 10 CFR 50.46 Appendix K (BART/BASH/NOTRUMP) Evaluation Model Mid-Year Notification and Reporting for 2000," June 30, 2000.
- 5 . WAT-D-11195. "10 CFR 50.46 Mid-Year Notification and Reporting for 2003," November 2003.
- 6 . WAT-D-11285. "Evaluation of Proposed Changes to the Stroke Time for the ECCS Valves," November 2004.
- 7 . WAT-D-11360. "Safety Injection Pump Discharge Relief Valve Leakage Evaluation," July 2005.

Westinghouse LOCA Peak Clad Temperature Summary for Small Break

Plant Name: Watts Bar Unit 1
Utility Name: Tennessee Valley Authority
Revision Date: 7/26/05

Notes:

None