

WBN2Public Resource

From: Boyd, Desiree L [dlboyd@tva.gov]
Sent: Wednesday, October 17, 2012 6:43 AM
To: Epperson, Dan; Wilson, George; Poole, Justin
Cc: Arent, Gordon; Hamill, Carol L; Boyd, Desiree L
Subject: TVA letter to NRC_10-16-2012_10 CFR 50.46 U2 Submittal
Attachments: 10-16-2012_10 CFR 50.46 U2 Submittal_Final.pdf

Please see attached TVA letter that was sent to the NRC today.

Thank You,

~*~*~*~*~*~*~*~*~*~

Desiree L. Boyd

WBN Unit 2 Licensing

dlboyd@tva.gov

423-365-8764

Hearing Identifier: Watts_Bar_2_Operating_LA_Public
Email Number: 754

Mail Envelope Properties (7AB41F650F76BD44B5BCAB7C0CCABFAF346C4D85)

Subject: TVA letter to NRC_10-16-2012_10 CFR 50.46 U2 Submittal
Sent Date: 10/17/2012 6:42:31 AM
Received Date: 10/17/2012 6:42:34 AM
From: Boyd, Desiree L

Created By: dlboyd@tva.gov

Recipients:

"Arent, Gordon" <garent@tva.gov>
Tracking Status: None
"Hamill, Carol L" <clhamill@tva.gov>
Tracking Status: None
"Boyd, Desiree L" <dlboyd@tva.gov>
Tracking Status: None
"Epperson, Dan" <Dan.Epperson@nrc.gov>
Tracking Status: None
"Wilson, George" <George.Wilson@nrc.gov>
Tracking Status: None
"Poole, Justin" <Justin.Poole@nrc.gov>
Tracking Status: None

Post Office: TVANUCXVS2.main.tva.gov

Files	Size	Date & Time
MESSAGE	264	10/17/2012 6:42:34 AM
10-16-2012_10 CFR 50.46 U2 Submittal_Final.pdf		151045

Options

Priority: Standard
Return Notification: No
Reply Requested: Yes
Sensitivity: Normal
Expiration Date:
Recipients Received:



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

October 16, 2012

10 CFR 50.46

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

Watts Bar Nuclear Plant, Unit 2
NRC Docket No. 50-391

Subject: WATTS BAR NUCLEAR PLANT (WBN) UNIT 2 - 10 CFR 50.46 - ESTIMATED INCREASE IN PEAK CLAD TEMPERATURE (PCT) DUE TO THE EFFECT OF FUEL PELLETT THERMAL CONDUCTIVITY DEGRADATION AND PEAKING FACTOR BURNDOWN NOT BEING CONSIDERED - 30 DAY REPORT

Reference 1: Supplemental Safety Evaluation Report (SSER) 24, "Safety Evaluation Report Related to the Operation of Watts Bar Nuclear Plant, Unit 2, Docket No. 50-391, Tennessee Valley Authority," published September 2011

The purpose of this letter is to report, in accordance with 10 CFR 50.46, a significant change in PCT of greater than 50 degrees (i.e., 175°F increase). TVA was recently notified by Westinghouse letter, LTR-LIS-12-413, dated September 20, 2012, that fuel pellet thermal conductivity degradation (TCD) and peaking factor burndown were not explicitly considered in the Watts Bar Unit 2 Best Estimate Large Break Loss-of-Coolant Accident (BE LBLOCA) Analysis of Record (AOR). Taking TCD and peaking factor burndown into account resulted in the 175°F increase in PCT. This results in a new PCT of 1,727°F, replacing the 1,552°F value previously accepted by NRC in Reference 1.

Enclosure 1 provides an evaluation of this estimated effect. Since the estimated increase of 175°F PCT is based on the generic Westinghouse Owner's Group analysis, a specific WBN Unit 2 analysis will be performed to provide a unit-specific AOR PCT value prior to Unit 2 licensing. This action is captured as SSER open item No. 61; therefore, this action does not represent a new commitment. Enclosure 2 provides the Unit 2 Westinghouse Rackup Sheet.

U.S. Nuclear Regulatory Commission
Page 2
October 16, 2012

There are no new commitments made in this letter.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 16th day of October, 2012.

If you have any questions, please contact me at (423) 365-2004.

Respectfully,



Raymond A. Hruby, Jr.
General Manager, Technical Services
Watts Bar Unit 2

Enclosures:

1. Evaluation of Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown
2. Westinghouse Rackup Sheet

cc (Enclosures):

U. S. Nuclear Regulatory Commission
Region II
Marquis One Tower
245 Peachtree Center Ave., NE Suite 1200
Atlanta, Georgia 30303-1257

NRC Resident Inspector Unit 2
Watts Bar Nuclear Plant
1260 Nuclear Plant Road
Spring City, Tennessee 37381

U.S. Nuclear Regulatory Commission
Page 3
October 16, 2012

bcc (Enclosures):

Jessie Quichocho
U.S. Nuclear Regulatory Commission
MS 08G9A
One White Flint North
11555 Rockville Pike
Rockville, Maryland 20852-2738

Fred Brown, Deputy Regional Administrator for Construction
U. S. Nuclear Regulatory Commission
Region II
Marquis One Tower
245 Peachtree Center Ave., NE Suite 1200
Atlanta, Georgia 30303-1257

Enclosure 1

Evaluation of Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown

Background

Fuel pellet thermal conductivity degradation (TCD) and peaking factor burndown were not explicitly considered in the Watts Bar Unit 2 Best Estimate Large Break Loss-of-Coolant Accident (BE LBLOCA) Analysis of Record (AOR). NRC Information Notice 2011-21 (Reference 1) notified addressees of recent information obtained concerning the impact of irradiation on fuel thermal conductivity and its potential to cause significantly higher predicted peak cladding temperature (PCT) results in realistic emergency core cooling system (ECCS) evaluation models. This evaluation provides an estimated effect of fuel pellet TCD and peaking factor burndown on the PCT calculation for the WBN Unit 2 BE LBLOCA AOR. This change represents a Non-Discretionary Change in accordance with Section 4.1.2 of WCAP-13451 (Reference 2).

Affected Evaluation Model

2004 Westinghouse Realistic Large Break LOCA Evaluation Model Using ASTRUM

Estimated Effect

A quantitative evaluation, as discussed in Reference 3, was performed to assess the PCT effect of fuel pellet TCD and peaking factor burndown on the WBN Unit 2 BE LBLOCA analysis and concluded that the estimated PCT impact is 175°F for 10 CFR 50.46 reporting purposes. The peaking factor burndown included in the evaluation is provided in Table 1 and is conservative for the first cycle. Tennessee Valley Authority and its vendor, Westinghouse Electric Company LLC, utilize processes which ensure the LOCA analysis input values conservatively bound the as-operated plant values for those parameters and will be validated as part of the reload design process.

Table 1: Peaking Factors Assumed in the Evaluation of TCD

Rod Burnup (MWd/MTU)	FdH ^{(1), (2)}	FQ Transient ⁽¹⁾	FQ Steady-State
0	1.650	2.500	2.000
30,000	1.650	2.500	2.000
60,000	1.400	1.875	1.500
62,000	1.400	1.875	1.500

(1) Includes uncertainties.

(2) Hot assembly average power follows the same burndown, since it is a function of FdH.

Enclosure 1

References

1. NRC Information Notice 2011-21, McGinty, T. J., and Dudes, L. A., "Realistic Emergency Core Cooling System Evaluation Model Effects Resulting From Nuclear Fuel Thermal Conductivity Degradation," December 13, 2011. (NRC ADAMS # ML113430785)
2. WCAP-13451, "Westinghouse Methodology for Implementation of 10 CFR 50.46 Reporting," October 1992.
3. OG-12-386, "For Information Only – Input Supporting the PWROG LBLOCA Program Regarding Nuclear Fuel Thermal Conductivity Degradation (PA-ASC-1073, Revision 0) (Proprietary/Non-Proprietary)," September 18, 2012.

Enclosure 2 Westinghouse Rackup Sheet

Westinghouse LOCA Peak Clad Temperature Summary for ASTRUM Best Estimate Large Break

Future

Plant Name: Watts Bar Unit 2
Utility Name: Tennessee Valley Authority
Revision Date: 9/20/2012

Analysis Information

EM: ASTRUM (2004) **Analysis Date:** 10/14/2009 **Limiting Break Size:** Split
FQ: 2.5 **FdH:** 1.65
Fuel: RFA-2 **SGTP (%):** 10

Notes:

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	1552	1	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1 . None	0		
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1 . None	0		
C. 2012 ECCS MODEL ASSESSMENTS			
1 . Evaluation of Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown	175	2	(a)
D. OTHER*			
1 . None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	PCT = 1727		
* It is recommended that the licensee determine if these PCT allocations should be considered with respect to 10 CFR 50.46 reporting requirements.			

References:

- 1 . WCAP-17093-P, Revision 0, "Best-Estimate Analysis of the Large-Break Loss-of-Coolant Accident for Watts Bar Unit 2 Nuclear Power Plant Using the ASTRUM Methodology," December 2009.
- 2 . LTR-LIS-12-413, "Watts Bar Units 1 and 2, 10 CFR 50.46 Notification and Reporting for Fuel Pellet Thermal Conductivity Degradation and Peaking Factor Burndown," September 20, 2012.

Notes:

- (a) This evaluation credits peaking factor burndown, see Reference 2.