10 CFR 50.46(a)(3)(ii)

A subsidiary of Pinnacle West Capital Corporation

Palo Verde Nuclear Generating Station

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102-06022-TNW/RKR
June 18, 2009

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

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Units 1, 2, and 3
Docket Nos. STN 50-528/529/530
Emergency Core Cooling System (ECCS) Performance Evaluation Models, 10 CFR 50.46(a)(3)(ii) Annual Report For Calendar Year 2008

Pursuant to 10 CFR 50.46(a)(3)(ii), Arizona Public Service Company (APS) is providing a summary of the cumulative effects on calculated peak clad temperature (PCT) for PVNGS due to changes or errors in ECCS performance evaluation models (see Enclosure 1). As shown in Enclosure 1, for 2008, there were two changes that affected the PVNGS large break loss of coolant accident (LOCA) peak clad temperature (PCT) calculation by as much as 26°F for Unit 1 and one change that affected the PVNGS large break LOCA PCT calculation by as much as 22°F for Units 2 and 3. These are not significant changes. There were no known errors or changes that affected the small break LOCA PCT calculation. Additionally, because PCT is not calculated as part of the post LOCA long-term cooling (LTC) analysis, there are no changes or errors in the LTC models that affect PCT.

Enclosures 2 and 3 provide a more detailed discussion of the changes and errors during this reporting period. Enclosure 2 is Westinghouse Electric Company report, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 for an Evaluation for the Insertion of 8 AREVA LTAs [lead test assemblies] and the Correction of an Error in the Steam Generator Economizer Input" (letter number LTR-OA-08-106, dated December 10, 2008). Enclosure 3 is Westinghouse Electric Company report, "Palo Verde Nuclear Generating Station Units 1, 2, and 3, 10 CFR 50.46 Annual Notification and Reporting for 2008" (letter number LTR-LAM-09-13, dated January 29, 2009). These reports describe the changes and errors in Westinghouse (formerly Combustion Engineering)

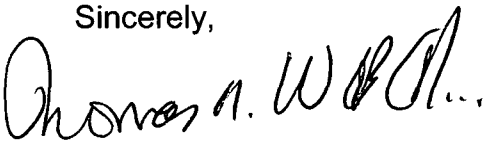
A002
NRR

models for Pressurized Water Reactors (PWRs) ECCS performance analysis in calendar year 2008. As stated above, there were no significant changes or errors in 2008.

No commitments are being made to the NRC by this letter.

Should you need further information regarding this submittal please contact Russell A. Stroud, Licensing Section Leader, at (623)393-5111.

Sincerely,



TNW/RAS/RKR/gat

Enclosures
1. Summary of Cumulative Effects on Calculated Peak Clad Temperature (PCT) for PVNGS Due to Changes/Errors in ECCS Performance Evaluation Models
2. Westinghouse Electric Company Report, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 for an Evaluation for the Insertion of 8 AREVA LTAs and the Correction of an Error in the Steam Generator Economizer Input," letter number LTR-OA-08-106, dated December 10, 2008
3. Westinghouse Electric Company Report, "Palo Verde Nuclear Generating Station Units 1, 2, and 3, 10 CFR 50.46 Annual Notification and Reporting for 2008," letter number LTR-LAM-09-13, dated January 29, 2009

cc:

E. E. Collins Jr.	NRC Region IV Regional Administrator
J. R. Hall	NRC NRR Project Manager
R. I. Treadway	NRC Senior Resident Inspector for PVNGS

ENCLOSURE 1

Summary of Cumulative Effects on Calculated Peak Clad Temperature (PCT) for PVNGS Due to Changes/Errors in ECCS Performance Evaluation Models

Table 1: Large Break LOCA Margin Summary Sheet for 2008

Plant Name: Palo Verde Nuclear Generating Station Units 1, 2, and 3

Utility Name: Arizona Public Service Company

Evaluation Model: Westinghouse (formerly Combustion Engineering) 1999 EM

Peak Clad Temperature: 2110°F (Analysis-of-Record reported in PVNGS UFSAR Section 6.3)

			Net PCT Effect	Absolute PCT Effect
A.	Cumulative 10 CFR 50.46 Changes and Error Corrections – Previously Reported for CY 2007			
	1. ECCS Model Assessment; STRIKIN-II Steam Cooling Model Error	ΔPCT =	+ 2°F	+ 2°F
	2. Planned Plant Modification; Revised Containment Passive Heat Sinks (e.g., Containment Sump Strainers Plant Modification)	ΔPCT =	+ 4°F	+ 4°F
	3. Planned Plant Modification; Revised Containment Passive Heat Sinks (Additional Changes Made Since Item A.2. ΔPCT Assessment)	ΔPCT =	+ 10°F	+ 10°F
B.	10 CFR 50.46 Changes and Error Corrections – New for CY 2008			
	1. ECCS Model Assessment; Steam Generator Economizer Error Correction	ΔPCT =	+ 22°F	+ 22°F
	2. Planned Plant Modification; Insertion of 8 AREVA Lead Test Assemblies (LTAs) Into PVNGS Unit 1 Core	ΔPCT =	+ 4°F (Unit 1 Only)	+ 4°F (Unit 1 Only)
C.	Absolute Sum of Cumulative 10 CFR 50.46 Changes and Error Corrections	ΔPCT =		+ 42°F (Unit 1) + 38°F (Unit 2) + 38°F (Unit 3)
D.	Licensing Basis PCT (Reported in UFSAR) + Cumulative PCT Assessments (Changes and Error Corrections)			2152°F (Unit 1) 2148°F (Unit 2) 2148°F (Unit 3)

The sum of the PCT from the most recent Analysis-of-Record (AOR) using an acceptable evaluation model, and the estimated cumulative effects of PCT impacts for changes and error corrections made since that AOR, remains less than 2200°F.

Table 2: Small Break LOCA Margin Summary Sheet for 2008

Plant Name: Palo Verde Nuclear Generating Station Units 1, 2, and 3

Utility Name: Arizona Public Service Company

Evaluation Model: Westinghouse (formerly Combustion Engineering) S2M

Peak Clad Temperature: 1618°F (Analysis-of-Record reported in PVNGS UFSAR Section 6.3)

			Net PCT Effect	Absolute PCT Effect
A.	Cumulative 10 CFR 50.46 Changes and Error Corrections – Previously Reported for CY 2007			
	1. None Identified	ΔPCT =	+ 0°F	+ 0°F
B.	10 CFR 50.46 Changes and Error Corrections – New for CY 2008			
	1. None Identified	ΔPCT =	+ 0°F	+ 0°F
C.	Absolute Sum of Cumulative 10 CFR 50.46 Changes and Error Corrections	ΔPCT =		+ 0°F
D.	Licensing Basis PCT (Reported in UFSAR) + Cumulative PCT Assessments (Changes and Error Corrections)			1618°F

The sum of the PCT from the most recent Analysis-of-Record (AOR) using an acceptable evaluation model, and the estimated cumulative effects of PCT impacts for changes and error corrections made since that AOR, remains less than 2200°F.

ENCLOSURE 2

Westinghouse Electric Company Report, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 for an Evaluation for the Insertion of 8 AREVA LTAs and the Correction of an Error in the Steam Generator Economizer Input," letter number LTR-OA-08-106, dated December 10, 2008

Westinghouse Electric Company
Nuclear Services
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Direct tel: (860) 731-1651
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E-mail: manganev@westinghouse.com

Our ref: LTR-OA-08-106, Revision 0

Date: December 10, 2008

10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 for an Evaluation for the Insertion of 8 AREVA LTAs and the Correction of an Error in the Steam Generator Economizer Input

Dear Sir or Madam:

The attachment to this letter documents the 10 CFR 50.46 Report for the AREVA LTA Insertion Evaluation on the Palo Verde Nuclear Generating Station (PVNGS) Unit 1 Large Break Loss of Coolant Accident (LBLOCA) Emergency Core Cooling System (ECCS) performance analysis and the Small Break LOCA (SBLOCA) ECCS performance analysis. In addition, the 10 CFR 50.46 Report has been updated to include an error correction in the Steam Generator (SG) economizer input to the 1999 EM (PVNGS Units 1, 2, and 3 LBLOCA ECCS performance analysis). Please contact your Plant Cognizant Engineer, Elizabeth Mangan, if there are any questions concerning this information.

Author: *Electronically Approved**
E.V. Mangan
Operations Analysis

Verifier: *Electronically Approved**
E.J. Rogers
Operations Analysis

Approved: *Electronically Approved**
S.P. Rigby, Manager
Operations Analysis

Attachment - 2 pages (Background, Evaluation and Estimated Effect, References)
6 pages (Updated LOCA PCT Rackup Sheets)

**Electronically approved records are authenticated in the electronic document management system.*

Evaluation for the Insertion of 8 AREVA LTAs into Palo Verde
(Discretionary Change)

Background

Arizona Public Service (APS) has requested that an evaluation be performed for Palo Verde Nuclear Generating Station (PVNGS) to evaluate the impact of inserting 8 AREVA LTAs into the Palo Verde Unit 1 core.

Evaluation and Estimated Effect

The insertion of 8 AREVA LTAs into the Palo Verde Unit 1 core is evaluated in Reference 1. The evaluation resulted in a 4°F increase in PCT for LBLOCA and no impact for SBLOCA.

References

1) LTR-OA-08-50, "ECCS Performance Evaluation of Westinghouse Fuel for the Addition of AREVA LTAs into Palo Verde," 9/12/2008.

Steam Generator Economizer Error Correction
(Non-Dicretionary Change)

Background

An error was identified in the Steam Generator (SG) Economizer input. The error is in the F4ACML input file. The F4ACML input file is a 1999 EM input file that provides plant design data inputs to the CEFLASH-4A and COMPERC-II codes. The F4ACML input file consists of line entries in free format. Most lines contain two entries. The first is the input parameter variable name and the second is the numeric value for the input parameter. The error involved two input parameters for the 1999 EM COMPERC-II steam generator heat transfer model. Specifically, it was intended that a value of 9 be assigned to variable SG_NSEC (the number of sectionalized layers in the steam generator, excluding the economizer) and a value of 3 be assigned to variable SG_IECON (the number of sectionalized layers in the steam generator economizer). The two lines in the input file should have looked like the following:

SG_NSEC 9.0

SG_IECON 3.0

Instead, the following two lines were in the file:

SG_NSEC 9.0

SG_NSEC 3.0

The file defined a value of 3 for SG_NSEC, instead of a value of 9; and a zero value for SG_IECON (default value), instead of a value of 3. This resulted in the file defining the incorrect number of layers in the steam generators and treating the steam generators as non-economizer steam generators. The F4ACML file with this error was used in the AOR cases that produced the PCT.

Affected Evaluation Models

1999 EM

Estimated Effect

The effect of correcting this error results in a 22 °F increase in the PCT for Palo Verde Units 1, 2, and 3 LBLOCA analysis.

Westinghouse LOCA Peak Clad Temperature Summary for Appendix K Large Break

Plant Name: Palo Verde Nuclear Generating Station Unit 1
Utility Name: Arizona Public Service
Revision Date: 12/8/2008

Analysis Information

EM:	1999 EM	**Analysis Date:**	3/18/2002	**Limiting Break Size:**	0.6 DEG/PD
Fuel:	16x16 System 80	**SGTP (%):**	10		
		PLHGR (kW/ft):	13.1		

Notes: 1. Plant Configuration: Rated Core Power = 3990 MWt, Replacement Steam Generators.

2. Fuel Design: 16x16 System 80 with ZIRLO™ cladding, value-added pellets, and erbia burnable absorbers.

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	**2110**	**1**	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1 . STRIKIN-II Steam Cooling Model Error	2	2	
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1 . Revised Containment Passive Heat Sinks	4	3	
2 . Reference 4 Containment Passive Heat Sinks	10	5	
3 . Evaluation for the Insertion of 8 AREVA LTAs into Palo Verde	4	6	
C. 2008 ECCS MODEL ASSESSMENTS			
1 . Steam Generator Economizer Error Correction	22	6	
D. OTHER*			
1 . None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT =** 2152		

* It is recommended that the licensee determine if these PCT allocations be considered with respect to 10 CFR 50.46 reporting requirements.

Reference

1 . A-PV-FE-0148, Rev. 002, "PVNGS LBLOCA ECCS Performance Analysis with Revised Containment Heat Sinks Data and ZIRLO™ Using 1999 EM," March 2002.

2 . LTR-LIS-06-117, "10 CFR 50.46 Annual Notification and Reporting for 2005," March 2006.

3 . LTR-OA-06-94, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 Changes in Containment Passive Heat Sink Data," October 2006.

4 . 13-NC-ZC-0237, Rev. 4, "Maximum Passive Heat Sink For Hydrogen Generation & ECCS Evaluation," April 2007.

5 . LTR-OA-07-109, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 for 13-NC-ZC-0237, Rev. 4 Changes in Containment Passive Heat Sink Data," December 2007.

6 . LTR-OA-08-106, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 for an Evaluation for the Insertion of 8 AREVA LTAs and the Correction of an Error in the Steam Generator Economizer Input," December, 2008.

Notes

None

Westinghouse LOCA Peak Clad Temperature Summary for Appendix K Small Break

Plant Name: Palo Verde Nuclear Generating Station Unit 1
Utility Name: Arizona Public Service
Revision Date: 12/8/2008

Analysis Information

EM:	S2M	**Analysis Date:**	3/22/2002	**Limiting Break Size:**	0.05 sq ft/PD
Fuel:	16x16 System 80	**SGTP (%):**	10		
		PLHGR (kW/ft):	13.5		

Notes: 1. Plant Configuration: Rated Core Power = 3990 MWt, Replacement Steam Generators.

2. Fuel Design: 16x16 System 80 with ZIRLO™ cladding, value-added pellets, and erbia burnable absorbers.

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	**1618**	**1**	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1 . None	0		
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1 . Evaluation for the Insertion of 8 AREVA LTAs Into Palo Verde	0	2	
C. 2008 ECCS MODEL ASSESSMENTS			
1 . None	0		
D. OTHER*			
1 . None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT =** 1618		

* It is recommended that the licensee determine if these PCT allocations be considered with respect to 10 CFR 50.46 reporting requirements.

Reference

1 . A-PV-FE-0149, Rev. 001, "Palo Verde Units 1, 2 and 3 S2M Bounding SBLOCA ECCS Performance Analysis," March 2002.
2 . LTR-OA-08-106, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 for an Evaluation for the Insertion of 8 AREVA LTAs and the Correction of an Error in the Steam Generator Economizer Input," December, 2008.

Notes

None

Westinghouse LOCA Peak Clad Temperature Summary for Appendix K Large Break

Plant Name: Palo Verde Nuclear Generating Station Unit 2
Utility Name: Arizona Public Service
Revision Date: 12/8/2008

Analysis Information

EM:	1999 EM	**Analysis Date:**	3/18/2002	**Limiting Break Size:**	0.6 DEG/PD
Fuel:	16x16 System 80	**SGTP (%):**	10		
		PLHGR (kW/ft):	13.1		

Notes: 1. Plant Configuration: Rated Core Power = 3990 MWt, Replacement Steam Generators.

2. Fuel Design: 16x16 System 80 with ZIRLO™ cladding, value-added pellets, and erbia burnable absorbers.

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	2110	1	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1 . STRIKIN-II Steam Cooling Model Error	2	2	
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1 . Revised Containment Passive Heat Sinks	4	3	
2 . Reference 4 Containment Passive Heat Sinks	10	5	
C. 2008 ECCS MODEL ASSESSMENTS			
1 . Steam Generator Economizer Error Correction	22	6	
D. OTHER*			
1 . None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT =** 2148		

* It is recommended that the licensee determine if these PCT allocations be considered with respect to 10 CFR 50.46 reporting requirements.

Reference

1 . A-PV-FE-0148, Rev. 002, "PVNGS LBLOCA ECCS Performance Analysis with Revised Containment Heat Sinks Data and ZIRLO™ Using 1999 EM," March 2002.

2 . LTR-LIS-06-117, "10 CFR 50.46 Annual Notification and Reporting for 2005," March 2006.

3 . LTR-OA-06-94, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 Changes in Containment Passive Heat Sink Data," October 2006.

4 . 13-NC-ZC-0237, Rev. 4, "Maximum Passive Heat Sink For Hydrogen Generation & ECCS Evaluation," April 2007.

5 . LTR-OA-07-109, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 for 13-NC-ZC-0237, Rev. 4 Changes in Containment Passive Heat Sink Data," December 2007.

6 . LTR-OA-08-106, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 for an Evaluation for the Insertion of 8 AREVA LTAs and the Correction of an Error in the Steam Generator Economizer Input," December, 2008.

Notes

None

Westinghouse LOCA Peak Clad Temperature Summary for Appendix K Small Break

Plant Name: Palo Verde Nuclear Generating Station Unit 2
Utility Name: Arizona Public Service
Revision Date: 10/11/2006

Analysis Information

EM:	S2M	**Analysis Date:**	3/22/2002	**Limiting Break Size:**	0.05 sq ft/PD
Fuel:	16x16 System 80	**SGTP (%):**	10		
		PLHGR (kW/ft):	13.5		

Notes: 1. Plant Configuration: Rated Core Power = 3990 MWt, Replacement Steam Generators.

2. Fuel Design: 16x16 System 80 with ZIRLO™ cladding, value-added pellets, and erbia burnable absorbers.

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	**1618**	**1**	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1 . None	0		
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1 . None	0		
C. 2008 ECCS MODEL ASSESSMENTS			
1 . None	0		
D. OTHER*			
1 . None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT =** 1618		

* It is recommended that the licensee determine if these PCT allocations be considered with respect to 10 CFR 50.46 reporting requirements.

Reference

1 . A-PV-FE-0149, Rev. 001, "Palo Verde Units 1, 2 and 3 S2M Bounding SBLOCA ECCS Performance Analysis," March 2002.

Notes

None

Westinghouse LOCA Peak Clad Temperature Summary for Appendix K Large Break

Plant Name: Palo Verde Nuclear Generating Station Unit 3
Utility Name: Arizona Public Service
Revision Date: 12/8/2008

Analysis Information

EM:	1999 EM	**Analysis Date:**	3/18/2002	**Limiting Break Size:**	0.6 DEG/PD
Fuel:	16x16 System 80	**SGTP (%):**	10		
		PLHGR (kW/ft):	13.1		

Notes: 1. Plant Configuration: Rated Core Power = 3990 MWt, Replacement Steam Generators.

2. Fuel Design: 16x16 System 80 with ZIRLO™ cladding, value-added pellets, and erbia burnable absorbers.

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	2110	1	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1 . STRIKIN-II Steam Cooling Model Error	2	2	
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1 . Revised Containment Passive Heat Sinks	4	3	
2 . Reference 4 Containment Passive Heat Sinks	10	5	
C. 2008 ECCS MODEL ASSESSMENTS			
1 . Steam Generator Economizer Error Correction	22	6	
D. OTHER*			
1 . None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT =** 2148		

* It is recommended that the licensee determine if these PCT allocations be considered with respect to 10 CFR 50.46 reporting requirements.

Reference

1 . A-PV-FE-0148, Rev. 002, "PVNGS LBLOCA ECCS Performance Analysis with Revised Containment Heat Sinks Data and ZIRLO™ Using 1999 EM," March 2002.

2 . LTR-LIS-06-117, "10 CFR 50.46 Annual Notification and Reporting for 2005," March 2006.

3 . LTR-OA-06-94, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 Changes in Containment Passive Heat Sink Data," October 2006.

4 . 13-NC-ZC-0237, Rev. 4, "Maximum Passive Heat Sink For Hydrogen Generation & ECCS Evaluation," April 2007.

5 . LTR-OA-07-109, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 for 13-NC-ZC-0237, Rev. 4 Changes in Containment Passive Heat Sink Data," December 2007.

6 . LTR-OA-08-106, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 for an Evaluation for the Insertion of 8 AREVA LTAs and the Correction of an Error in the Steam Generator Economizer Input," December, 2008.

Notes

None

Westinghouse LOCA Peak Clad Temperature Summary for Appendix K Small Break

Plant Name: Palo Verde Nuclear Generating Station Unit 3
Utility Name: Arizona Public Service
Revision Date: 12/20/2007

Analysis Information

EM:	S2M	**Analysis Date:**	3/22/2002	**Limiting Break Size:**	0.05 sq ft/PD
Fuel:	16x16 System 80	**SGTP (%):**	10		
		PLHGR (kW/ft):	13.5		

Notes: 1. Plant Configuration: Rated Core Power = 3990 MWt, Replacement Steam Generators.

2. Fuel Design: 16x16 System 80 with ZIRLO™ cladding, value-added pellets, and erbia burnable absorbers.

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	**1618**	**1**	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1 . None	0		
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1 . None	0		
C. 2008 ECCS MODEL ASSESSMENTS			
1 . None	0		
D. OTHER*			
1 . None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT =** 1618		

* It is recommended that the licensee determine if these PCT allocations be considered with respect to 10 CFR 50.46 reporting requirements.

Reference

1 . A-PV-FE-0149, Rev. 001, "Palo Verde Units 1, 2 and 3 S2M Bounding SBLOCA ECCS Performance Analysis," March 2002.

Notes

None

ENCLOSURE 3

Westinghouse Electric Company Report, "Palo Verde Nuclear Generating Station Units 1, 2, and 3, 10 CFR 50.46 Annual Notification and Reporting for 2008," letter number LTR-LAM-09-13, dated January 29, 2009

Westinghouse Electric Company
Nuclear Services
P. O. Box 355
Pittsburgh, Pennsylvania 15230-0355
USA

Direct tel: (412) 374-4469
Direct fax: (860) 731-6439
e-mail: saundese@westinghouse.com
Our ref: LTR-LAM-09-13
January 29, 2009

Palo Verde Nuclear Generating Station Unit 1, 2 and 3
10 CFR 50.46 Annual Notification and Reporting for 2008

Dear Sir or Madam:

This letter provides 10 CFR 50.46 reporting information pertaining to changes and errors in the Westinghouse Electric Company Emergency Core Cooling System (ECCS) performance Evaluation Models (EMs) and their application to your plant(s) for calendar year 2008.

Descriptions of all calendar year 2008 changes that were made to the 1999 EM are enclosed in the Attachment. The 1999 EM is the EM used in your plant's Large Break Loss-of-Coolant Accident (LBLOCA) ECCS performance analysis. There were no error corrections to the 1999 EM in calendar year 2008. In addition, there were no changes or error corrections in calendar year 2008 to the Supplement 2 Evaluation Model (S2M), which is the EM used in your plant's Small Break Loss-of-Coolant Accident (SBLOCA) ECCS performance analysis. The descriptions of the calendar year 2008 changes to the 1999 EM in the Attachment will be provided to the NRC via a Westinghouse letter.

The Peak Cladding Temperature (PCT) Rackup sheets for your plant are also enclosed in the Attachment. The rackup sheets, which were obtained from the Westinghouse 10 CFR 50.46 Rackup eRoom, identify the PCTs of the ECCS performance Analyses of Record (AORs) for your plant(s) and the PCT assessments associated with the AORs through the end of calendar year 2008. Note that changes and errors in the EMs that have a PCT assessment of 0°F are generally not listed in Section C of the rackup sheet.

This letter is provided for your use in making a determination relative to the reporting requirements of 10 CFR 50.46. The information provided in this letter was prepared in accordance with Westinghouse's Quality Management System (QMS).

S. E. Saunders (Electronically Approved)*
Author, LOCA Integrated Services II

E. V. Mangan (PCE) (Electronically Approved)*
Verifier, LOCA Analysis & Methods

J. Ghergurovich (Electronically Approved)*
Manager, LOCA Analysis & Methods

Attachment

**Electronically approved records are authenticated in the electronic document management system.*

IMPLEMENTATION OF OPTIONAL MODELS FOR A MIXED CORE ANALYSIS AND DEFORMED GRID COOLABILITY ANALYSIS
(Discretionary Change)

Background
The Appendix K ECCS Performance Analysis for LBLOCA for CE plants is performed with the 1999 Evaluation Model (1999 EM).

A new User-Controlled Interface (UCI) parameter ('mixed_core') is added to the UCI File Parameter List to facilitate the selection of optional model features for use in performing a non-licensing mixed core analysis. The mixed core analysis is used to analyze the effects of co-resident, thermal-hydraulically dissimilar, fuel assembly design types. This new UCI option is not intended for licensing applications of the 1999 EM, which must use a uniform core representation of one fuel assembly type for conformance to the 1999 EM licensed methodology. As required by the NRC in Limitations and Conditions for WCAP-16500, the Core Reference Report for the Implementation of the CE 16x16 Next Generation Fuel (NGF) assembly design, mixed core effects must be dispositioned. The mixed core UCI file parameter is designed to automate base deck input vector changes needed to perform analyses to disposition transition core configurations.

Also, a new UCI parameter ('deformed_grid') is added to the UCI File Parameter List to facilitate the selection of optional model features for use in performing a non-licensing Deformed Grid Coolability Analysis (DGCA) as part of the Seismic/LOCA fuel design qualification process. This new UCI option is not intended for licensing application of the 1999 EM, which is constrained by NRC imposed limitations/constraints to applications for ECCS Performance Analysis only. However, the DGCA analysis is permissible under NUREG 0800, SRP 4.2, Appendix A, Section D, where cases of deformed grids are acceptable for fuel assembly designs provided an ECCS Performance analysis confirms that 10 CFR 50.46 peak cladding temperature and maximum local cladding oxidation criteria are satisfied with the assumption of maximum credible grid deformation.

Affected Evaluation Model(s)
Non-Licensing Applications using the Appendix K LBLOCA Evaluation Model, 1999 EM

Estimated Effect
This process improvement is for non-licensing applications. Therefore, this change has no impact on the licensed methodology for the 1999 EM and does not conflict with the SER limitation/constraints imposed on the methodology by NRC for licensing applications. For licensing applications, there is no impact on PCT for 10 CFR 50.46 reporting purposes since these changes are intended only for use in non-licensing calculations.

UPDATE TO THE OXIDATION MODEL USER-CONTROL PARAMETER OPTION TO PERFORM EMBRITTLEMENT ANALYSIS
(Discretionary Change)

Background
An update to the Oxidation Model UCI parameter ('oxidation_model') has been added to activate the calculation of the new NRC Embrittlement Model as described in the NRC's Research Information Letter (RIL) 0801. RIL 0801 is the NRC's announcement to the industry of planned regulatory modifications to the cladding embrittlement criteria of 10 CFR 50.46. The details of the ECCS Acceptance Criteria change have not been finalized by the NRC, but the essential elements of NRC's planned change are known. The purpose of this update to the STRIKIN-II computer code is to modify the code logic to implement the preliminary capabilities that are necessary to calculate the new embrittlement model. This update to the Oxidation Model UCI parameter is a non-licensing option that is added to the 1999 EM to facilitate scoping studies and various advanced model calculations.

Affected Evaluation Model(s)
Non-Licensing Applications using the Appendix K LBLOCA Evaluation Model, 1999 EM

Estimated Effect
This process improvement is for non-licensing applications. Therefore, this change has no impact on the licensed methodology for the 1999 EM and does not conflict with the SER limitation/constraints imposed on the methodology by NRC for licensing applications. For licensing applications, there is no impact on PCT for 10 CFR 50.46 reporting purposes since these changes are intended only for use in non-licensing calculations.

EVALUATION FOR THE INSERTION OF 8 AREVA LTAS INTO PALO VERDE (Discretionary Change)

Background

Arizona Public Service (APS) has requested that an evaluation be performed for Palo Verde Nuclear Generating Station (PVNGS) to evaluate the impact of inserting 8 AREVA LTAs into the Palo Verde Unit 1 core.

Evaluation and Estimated Effect

The insertion of 8 AREVA LTAs into the Palo Verde Unit 1 core is evaluated in Reference 1. The evaluation resulted in a 4°F increase in PCT for LBLOCA and no impact for SBLOCA.

Reference(s)

1. LTR-OA-08-50, "ECCS Performance Evaluation of Westinghouse Fuel for the Addition of AREVA LTAs into Palo Verde," 9/12/2008.

STEAM GENERATOR ECONOMIZER ERROR CORRECTION
(Non-Discretionary Change)

Background
An error was identified in the Steam Generator (SG) Economizer input. The error is in the F4ACML input file. The F4ACML input file is a 1999 EM input file that provides plant design data inputs to the CEFLASH-4A and COMPERC-II codes. The F4ACML input file consists of line entries in free format. Most lines contain two entries. The first is the input parameter variable name and the second is the numeric value for the input parameter. The error involved two input parameters for the 1999 EM COMPERC-II steam generator heat transfer model. Specifically, it was intended that a value of 9 be assigned to variable SG_NSEC (the number of sectionalized layers in the steam generator, excluding the economizer) and a value of 3 be assigned to variable SG_IECON (the number of sectionalized layers in the steam generator economizer). The two lines in the input file should have looked like the following:

SG_NSEC 9.0
SG_IECON3.0

Instead, the following two lines were in the file:

SG_NSEC 9.0
SG_NSEC 3.0

The file defined a value of 3 for SG_NSEC, instead of a value of 9; and a zero value for SG_IECON (default value), instead of a value of 3. This resulted in the file defining the incorrect number of layers in the steam generators and treating the steam generators as non-economizer steam generators. The F4ACML file with this error was used in the AOR cases that produced the PCT.

Affected Evaluation Model(s)
Appendix K LBLOCA Evaluation Model, 1999 EM

Estimated Effect
The effect of correcting this error results in a 22 °F increase in the PCT for Palo Verde Units 1, 2, and 3 LBLOCA analysis.

Westinghouse LOCA Peak Clad Temperature Summary for Appendix K Large Break

Plant Name: Palo Verde Nuclear Generating Station Unit 1
Utility Name: Arizona Public Service
Revision Date: 1 /27/09

Analysis Information

EM:	1999 EM	**Analysis Date:**	3/18/02	**Limiting Break Size:**	0.6 DEG/PD
Fuel:	16x16 System 80	**SGTP (%):**	10		
		PLHGR (kW/ft):	13.1		

Notes: 1. Plant Configuration: Rated Core Power = 3990 MWt, Replacement Steam Generators.

2. Fuel Design: 16x16 System 80 with ZIRLO™ cladding, value-added pellets, and erbia burnable absorbers.

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	**2110**	**1**	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1 . STRIKIN-II Steam Cooling Model Error	2	2	
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1 . Revised Containment Passive Heat Sinks	4	3	
2 . Reference 4 Containment Passive Heat Sinks	10	5	
3 . Evaluation for the Insertion of 8 AREVA LTAs into Palo Verde	4	6	
C. 2008 ECCS MODEL ASSESSMENTS			
1 . Steam Generator Economizer Error Correction	22	6	
D. OTHER*			
1 . None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT =** 2152		

* It is recommended that the licensee determine if these PCT allocations be considered with respect to 10 CFR 50.46 reporting requirements.

References:

1 . A-PV-FE-0148, Rev. 002, "PVNGS LBLOCA ECCS Performance Analysis with Revised Containment Heat Sinks Data and ZIRLO™ Using 1999 EM," March 2002.

2 . LTR-LIS-06-117, "10 CFR 50.46 Annual Notification and Reporting for 2005," March 2006.

3 . LTR-OA-06-94, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 Changes in Containment Passive Heat Sink Data," October 2006.

4 . 13-NC-ZC-0237, Rev. 4, "Maximum Passive Heat Sink For Hydrogen Generation & ECCS Evaluation," April 2007.

5 . LTR-OA-07-109, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 for 13-NC-ZC-0237, Rev. 4 Changes in Containment Passive Heat Sink Data," December 2007.

6 . LTR-OA-08-106, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 for an Evaluation for the Insertion of 8 AREVA LTAs and the Correction of an Error in the Steam Generator Economizer Input," December, 2008.

Notes:

None

Westinghouse LOCA Peak Clad Temperature Summary for Appendix K Small Break

Plant Name: Palo Verde Nuclear Generating Station Unit 1
Utility Name: Arizona Public Service
Revision Date: 1 /27/09

Analysis Information

EM:	S2M	**Analysis Date:**	3/22/02	**Limiting Break Size:**	0.05 sq ft/PD
Fuel:	16x16 System 80	**SGTP (%):**	10		
		PLHGR (kW/ft):	13.5		

Notes: 1. Plant Configuration: Rated Core Power = 3990 MWt, Replacement Steam Generators.

2. Fuel Design: 16x16 System 80 with ZIRLO™ cladding, value-added pellets, and erbia burnable absorbers.

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	**1618**	**1**	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1 . None	0		
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1 . Evaluation for the Insertion of 8 AREVA LTAs Into Palo Verde	0	2	
C. 2008 ECCS MODEL ASSESSMENTS			
1 . None	0		
D. OTHER*			
1 . None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT =** 1618		

* It is recommended that the licensee determine if these PCT allocations be considered with respect to 10 CFR 50.46 reporting requirements.

References:

1 . A-PV-FE-0149, Rev. 001, "Palo Verde Units 1, 2 and 3 S2M Bounding SBLOCA ECCS Performance Analysis," March 2002.

2 . LTR-OA-08-106, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 for an Evaluation for the Insertion of 8 AREVA LTAs and the Correction of an Error in the Steam Generator Economizer Input," December, 2008.

Notes:

None

Westinghouse LOCA Peak Clad Temperature Summary for Appendix K Large Break

Plant Name: Palo Verde Nuclear Generating Station Unit 2
Utility Name: Arizona Public Service
Revision Date: 1 /27/09

Analysis Information

EM:	1999 EM	**Analysis Date:**	3/18/02	**Limiting Break Size:**	0.6 DEG/PD
Fuel:	16x16 System 80	**SGTP (%):**	10		
		PLHGR (kW/ft):	13.1		

Notes: 1. Plant Configuration: Rated Core Power = 3990 MWt, Replacement Steam Generators.

2. Fuel Design: 16x16 System 80 with ZIRLO™ cladding, value-added pellets, and erbia burnable absorbers.

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	**2110**	**1**	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1 . STRIKIN-II Steam Cooling Model Error	2	2	
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1 . Revised Containment Passive Heat Sinks	4	3	
2 . Reference 4 Containment Passive Heat Sinks	10	5	
C. 2008 ECCS MODEL ASSESSMENTS			
1 . Steam Generator Economizer Error Correction	22	6	
D. OTHER*			
1 . None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT =** 2148		

* It is recommended that the licensee determine if these PCT allocations be considered with respect to 10 CFR 50.46 reporting requirements.

References:

1 . A-PV-FE-0148, Rev. 002, "PVNGS LBLOCA ECCS Performance Analysis with Revised Containment Heat Sinks Data and ZIRLO™ Using 1999 EM," March 2002.

2 . LTR-LIS-06-117, "10 CFR 50.46 Annual Notification and Reporting for 2005," March 2006.

3 . LTR-OA-06-94, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 Changes in Containment Passive Heat Sink Data," October 2006.

4 . 13-NC-ZC-0237, Rev. 4, "Maximum Passive Heat Sink For Hydrogen Generation & ECCS Evaluation," April 2007.

5 . LTR-OA-07-109, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 for 13-NC-ZC-0237, Rev. 4 Changes in Containment Passive Heat Sink Data," December 2007.

6 . LTR-OA-08-106, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 for an Evaluation for the Insertion of 8 AREVA LTAs and the Correction of an Error in the Steam Generator Economizer Input," December, 2008.

Notes:

None

Westinghouse LOCA Peak Clad Temperature Summary for Appendix K Small Break

Plant Name: Palo Verde Nuclear Generating Station Unit 2
Utility Name: Arizona Public Service
Revision Date: 1 /27/09

Analysis Information

EM:	S2M	**Analysis Date:**	3/22/02	**Limiting Break Size:**	0.05 sq ft/PD
Fuel:	16x16 System 80	**SGTP (%):**	10		
		PLHGR (kW/ft):	13.5		

Notes: 1. Plant Configuration: Rated Core Power = 3990 MWt, Replacement Steam Generators.

2. Fuel Design: 16x16 System 80 with ZIRLO™ cladding, value-added pellets, and erbia burnable absorbers.

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	**1618**	**1**	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1 . None	0		
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1 . None	0		
C. 2008 ECCS MODEL ASSESSMENTS			
1 . None	0		
D. OTHER*			
1 . None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT =** 1618		

* It is recommended that the licensee determine if these PCT allocations be considered with respect to 10 CFR 50.46 reporting requirements.

References:

1 . A-PV-FE-0149, Rev. 001, "Palo Verde Units 1, 2 and 3 S2M Bounding SBLOCA ECCS Performance Analysis," March 2002.

Notes:

None

Westinghouse LOCA Peak Clad Temperature Summary for Appendix K Large Break

Plant Name: Palo Verde Nuclear Generating Station Unit 3
Utility Name: Arizona Public Service
Revision Date: 1 /27/09

Analysis Information

EM:	1999 EM	**Analysis Date:**	3/18/02	**Limiting Break Size:**	0.6 DEG/PD
Fuel:	16x16 System 80	**SGTP (%):**	10		
		PLHGR (kW/ft):	13.1		

Notes: 1. Plant Configuration: Rated Core Power = 3990 MWt, Replacement Steam Generators.

2. Fuel Design: 16x16 System 80 with ZIRLO™ cladding, value-added pellets, and erbia burnable absorbers.

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	2110	1	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1 . STRIKIN-II Steam Cooling Model Error	2	2	
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1 . Revised Containment Passive Heat Sinks	4	3	
2 . Reference 4 Containment Passive Heat Sinks	10	5	
C. 2008 ECCS MODEL ASSESSMENTS			
1 . Steam Generator Economizer Error Correction	22	6	
D. OTHER*			
1 . None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT =** 2148		

* It is recommended that the licensee determine if these PCT allocations be considered with respect to 10 CFR 50.46 reporting requirements.

References:

1 . A-PV-FE-0148, Rev. 002, "PVNGS LBLOCA ECCS Performance Analysis with Revised Containment Heat Sinks Data and ZIRLO™ Using 1999 EM," March 2002.

2 . LTR-LIS-06-117, "10 CFR 50.46 Annual Notification and Reporting for 2005," March 2006.

3 . LTR-OA-06-94, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 Changes in Containment Passive Heat Sink Data," October 2006.

4 . 13-NC-ZC-0237, Rev. 4, "Maximum Passive Heat Sink For Hydrogen Generation & ECCS Evaluation," April 2007.

5 . LTR-OA-07-109, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 for 13-NC-ZC-0237, Rev. 4 Changes in Containment Passive Heat Sink Data," December 2007.

6 . LTR-OA-08-106, "10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 for an Evaluation for the Insertion of 8 AREVA LTAs and the Correction of an Error in the Steam Generator Economizer Input," December, 2008.

Notes:

None

Westinghouse LOCA Peak Clad Temperature Summary for Appendix K Small Break

Plant Name: Palo Verde Nuclear Generating Station Unit 3
Utility Name: Arizona Public Service
Revision Date: 1 /27/09

Analysis Information

EM:	S2M	**Analysis Date:**	3/22/02	**Limiting Break Size:**	0.05 sq ft/PD
Fuel:	16x16 System 80	**SGTP (%):**	10		
		PLHGR (kW/ft):	13.5		

Notes: 1. Plant Configuration: Rated Core Power = 3990 MWt, Replacement Steam Generators.

2. Fuel Design: 16x16 System 80 with ZIRLO™ cladding, value-added pellets, and erbia burnable absorbers.

	Clad Temp (°F)	Ref.	Notes
LICENSING BASIS			
Analysis-Of-Record PCT	**1618**	**1**	
PCT ASSESSMENTS (Delta PCT)			
A. PRIOR ECCS MODEL ASSESSMENTS			
1 . None	0		
B. PLANNED PLANT MODIFICATION EVALUATIONS			
1 . None	0		
C. 2008 ECCS MODEL ASSESSMENTS			
1 . None	0		
D. OTHER*			
1 . None	0		
LICENSING BASIS PCT + PCT ASSESSMENTS	**PCT =** 1618		

* It is recommended that the licensee determine if these PCT allocations be considered with respect to 10 CFR 50.46 reporting requirements.

References:

1 . A-PV-FE-0149, Rev. 001, "Palo Verde Units 1, 2 and 3 S2M Bounding SBLOCA ECCS Performance Analysis," March 2002.

Notes:

None

RACKUP eRoom Check:

EMs applicable to Palo Verde:
Appendix K LBLOCA Evaluation Model, 1999 EM
S2M Small Break LOCA Evaluation Model with CEFLASH-4AS

2008 Issues

Transmittal Letter	Issue Description
LTR-OA-08-106	PVNGS Units 1, 2, and 3 for an Evaluation for the Insertion of 8 AREVA LTAs and the Correction of an Error in the Steam Generator Economizer Input