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Our ref: LTR-OA-06-94

October 19, 2006

# 10 CFR 50.46 Report for PVNGS Units 1, 2, and 3 Changes in Containment Passive Heat Sink Data

Dear Sir or Madam:

The attachment documents the 10 CFR 50.46 Report for the evaluation of the impact of revised containment passive heat sinks on the Palo Verde Nuclear Generating Station (PVNGS) Units 1, 2, and 3 Large Break Loss-of-Coolant Accident (LBLOCA) Emergency Core Cooling System (ECCS) performance analysis. Additionally, it documents the current PCT Rackup for the PVNGS Units 1, 2, and 3 Small Break LOCA ECCS performance analysis.

Please contact your LOCA Plant Cognizant Engineer if there are any questions concerning this information.

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\*Electronically Approved Records Are Authenticated in the Electronic Document Management System

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#### 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
<b>Revision Date:</b>	10/16/06

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 Ten	np (°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>B. PLANNED PLANT MODIFICATION EVALUATIONS</b>				
1 . Revised Containment Passive Heat Sinks		4	3	
C. 2006 ECCS MODEL ASSESSMENTS				
1 . None		0		
D. OTHER*				
1 . None		0		
	DOT	0110		
LICENSING BASIS PCT + PCT ASSESSMENTS	PCT =	2116		

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.

Notes:

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## Westinghouse LOCA Peak Clad Temperature Summary for Appendix K Small Break

Plant Na Utility Na Revision	ame:	Palo Verde Arizona Put 10/16/06	Nuclear Generati Ilic Service	ng Station Un	it 1			
<u>Analysis</u> EM: Fuel: Notes:	S2M 16x16 1. Pla	System 80 nt Configuratio		10 13.5 ver = 3990 MWt,	Limiting Break Siz	nera	tors.	
LICENSI		_	6 System 80 with 2	LIRLU™ claddir	ng, value-added pellets, a Clad Temp (			Notes
A	nalysis	-Of-Record F ENTS (Delta			10	618	1	
<b>A.</b>		ECCS MOD	EL ASSESSMEN	ITS		0		
В.		NED PLANT I None		EVALUATION	IS	0		
C.		CCS MODEL	ASSESSMENT	S		0		
D.	OTHE	<b>R*</b> None				0		
			T + PCT ASSES		<b>PCT =</b> 1	618		<b>D</b> 50 40

\* 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:

## Westinghouse LOCA Peak Clad Temperature Summary for Appendix K Large Break

Plant Name:Palo Verde Nuclear Generating Station Unit 2Utility Name:Arizona Public ServiceRevision Date:10/16/06

Analysis InformationEM:1999 EMAnalysis Date:3/18/02Limiting Break Size:0.6 DEG/PDFuel:16x16 System 80SGTP (%):10PLHGR (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 Ten	וp (°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>B. PLANNED PLANT MODIFICATION EVALUATIONS</b>				
1 . Revised Containment Passive Heat Sinks		4	3	
C. 2006 ECCS MODEL ASSESSMENTS				
1 . None		0		
D. OTHER*				
1 . None		0		
LICENSING BASIS PCT + PCT ASSESSMENTS	PCT =	2116		
		2.10		

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.

#### Notes:

# Westinghouse LOCA Peak Clad Temperature Summary for Appendix K Small Break

Plant Na Utility N Revisio	lame:	Palo Verde Arizona Pul 10/11/06	Nuclear Generati olic Service	ing Station Un	it 2			
Analysis	Informa	<u>tion</u>						
EM: Fuel:	S2M	System 80	Analysis Date: SGTP (%):	3/22/02 10	Limiting Break Si	<b>ze:</b> 0.	.05 sq ft/	PD
uc	10/10	, cycloin cc	PLHGR (kW/ft):					
Notes:	1. Pla	nt Configuratio	· · ·		, Replacement Steam G	enerat	ors.	
	,2. Fu	el Design: 16x1	6 System 80 with 2	ZIRLO™ claddir	ng, value-added pellets,	and er	bia burna	able absorbers.
					Clad Temp	(°F)	Ref.	Notes
LICENS	ING BA	SIS						
	-	-Of-Record I ENTS (Delta				1618	1	
	. PRIOR	•		ITS		0		
						Ū		
В		NED PLANT	MODIFICATION	EVALUATION	IS .	0		
С		CCS MODE	ASSESSMENT	S		0		
D	. OTHE	<b>R*</b> None				0.		
L	ICENSI	NG BASIS PO	CT + PCT ASSES	SMENTS	PCT =	1618		
*	It is reco	mmended that t	he licensee determine	e if these PCT allo	ocations be considered with	respec	t to 10 CF	R 50.46

 It is recommended that the licensee determine if these PCT allocations be considered with respect to 10 CFR 50.4 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:

#### 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
<b>Revision Date:</b>	10/16/06

## **Analysis Information**

EM:	1999 EM	Analysis Date:	3/18/02	Limiting Break Size:	0.6 DEG/PD
Fuel:	16x16 System 80	SGTP (%):	15.9		
		PLHGR (kW/ft):	13.1		

Notes: 1. Plant Configuration: Rated Core Power = 3876 MWt, Original Steam Generators.

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

3. SGTP value is the maximum total percentage of plugged tubes for both steam generators (versus maximum percentage per steam generator).

	Clad Ten	וp (°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>B. PLANNED PLANT MODIFICATION EVALUATIONS</b>				
1 . Revised Containment Passive Heat Sinks		4	3	
C. 2006 ECCS MODEL ASSESSMENTS				
1 . None		0		
D. OTHER*				
1 . None		0		
LICENSING BASIS PCT + PCT ASSESSMENTS	DOT -	2116		
LICENSING DASIS PCT + PCT ASSESSMENTS	PCT =	2110		

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.
- 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.

#### Notes:

## 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
<b>Revision Date:</b>	10/11/06

**Analysis Information** 

EM: Analysis Date: 3/22/02 Limiting Break Size: 0.05 sq ft/PD S2M Fuel: 16x16 System 80 SGTP (%): 25 PLHGR (kW/ft): 13.5 1. Plant Configuration: Rated Core Power = 3876 MWt, Original Steam Generators.

Notes:

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 PCT ASSESSMENTS (Delta PCT)		1618	1		
A. PRIOR ECCS MODEL ASSESSMENTS 1 . None		0			
B. PLANNED PLANT MODIFICATION EVALUATIONS 1 None		0			
C. 2006 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:

# **ENCLOSURE 3**

Westinghouse Electric Company's, "10 CFR 50.46 Annual Notification and Reporting for 2006," letter number LTR-LIS-07-159, dated March 14, 2007