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**10 CFR 50.90**

Palo Verde Nuclear  
Generating Station

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**102-05967-JHH/DFS**  
**March 05, 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, 50-529, and 50-530**  
**Supplemental Information for Request for Amendment to Technical**  
**Specification 5.6.5b, Core Operating Limits Report (COLR)**

Arizona Public Service Company (APS) in letter No. 102-05889, dated August 29, 2008, requested to amend Operating Licenses NPF-41, NPF-51, and NPF-74 for Palo Verde Nuclear Generating Station (PVNGS) Units 1, 2, and 3, respectively. Specifically, the proposed amendment would modify Technical Specification (TS) 5.6.5, Core Operating Limits Report (COLR), by updating TS 5.6.5b to reflect the current analytical methods used to determine the core operating limits in PVNGS Units 1, 2, and 3. The original submittal included a reference to the NRC Safety Evaluation for the Unit 2 Replacement of Steam Generators and Up-rated Power Operation. In this supplement to the proposed TS amendment, APS is providing an additional reference to the NRC Safety Evaluation for the Units 1 and 3 Replacement of Steam Generators and Up-rated Power Operation. The enclosure includes changes to Sections 2, 3 and 6 of the proposed amendment, and replacement marked up and retyped TS pages.

This change provides additional information that clarifies the August 29, 2008 submittal, does not expand the scope of that submittal as originally noticed, and does not change the U.S. Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published in the Federal Register on November 4, 2008 (73 FR 65685).

There are no commitments 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.

A member of the **STARS** (Strategic Teaming and Resource Sharing) Alliance

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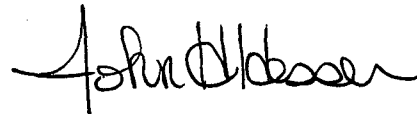
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I declare under penalty of perjury that the foregoing is true and correct.

Executed on 3/5/09  
(Date)

Sincerely,



DCM/TNW/DFS/

Enclosure: Supplemental Information for Proposed Amendment to TS 5.6.5.b

cc:	E. E. Collins Jr.	NRC Region IV Regional Administrator
	R. Hall	NRC NRR Project Manager
	R. I. Treadway	NRC Senior Resident Inspector for PVNGS
	A. V. Godwin	Arizona Radiation Regulatory Agency (ARRA)
	T. Morales	Arizona Radiation Regulatory Agency (ARRA)

**ENCLOSURE**

**Supplemental Information for the Proposed Amendment to TS 5.6.5.b**

In Section 2 of the August 29, 2008 submittal, the following underlined change has been added:

- d. "Safety Evaluation related to Palo Verde Nuclear Generating Station, Unit 2 (PVNGS-2) Issuance of Amendment on Replacement of Steam Generators and Up-rated Power Operation, (September 29, 2003)" and "Safety Evaluation related to Palo Verde Nuclear Generating Station, Units 1, 2, and 3 - Issuance of Amendments Re: Replacement of Steam Generators and Up-rated Power Operations and Associated Administrative Changes, (November 16, 2005)."  
[Methodology for Specifications 3.1.1, Shutdown Margin – Reactor Trip Breakers Open; 3.1.2, Shutdown Margin-Reactor Trip Breakers Closed; 3.1.4, Moderator Temperature Coefficient; 3.1.5, CEA Alignment; 3.1.7, Regulating CEA Insertion Limits; 3.1.8, Part Length or Part Strength CEA Insertion Limits; 3.2.1, Linear Heat Rate; 3.2.3, Azimuthal Power Tilt; 3.2.4, DNBR; 3.2.5; Axial Shape Index; 3.3.12; Boron Dilution Alarm System (BDAS); and 3.9.1, Boron Concentration (Mode 6).]

In Section 3 of the August 29, 2008 submittal, the following underlined changes have been added:

- d. "Safety Evaluation related to Palo Verde Nuclear Generating Station, Unit 2 (PVNGS-2) Issuance of Amendment on Replacement of Steam Generators and Up-rated Power Operation," (September 29, 2003) and "Safety Evaluation related to Palo Verde Nuclear Generating Station, Units 1, 2, and 3 - Issuance of Amendments Re: Replacement of Steam Generators and Up-rated Power Operations and Associated Administrative Changes, (November 16, 2005)."

Various methodologies were provided in the PVNGS Unit 2 license amendment request on the replacement of steam generators and up-rated power operations submitted on December 21, 2001, and as supplemented by letters to the NRC dated March 13, August 27, August 29, September 4, September 6, October 11, November 21, December 10, December 23, 2002, and March 11, June 10, July 25, and August 22, 2003. These various methodologies were approved with the issuance of that license amendment identified above.

These methodologies are used in the determination of shutdown margin with reactor trip breakers open, shutdown margin with reactor trip breakers closed, moderator temperature coefficient, CEA alignment, regulating CEA insertion limits, part length or part strength CEA insertion limits, linear heat rate, azimuthal power tilt, DNBR, axial shape index, boron dilution alarm setpoints, and boron

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**Proposed Amendment to TS 5.6.5**

concentration limits in Mode 6. (ADAMS Accession No. ML032720538). The Unit 2 listed methodologies were also approved for Units 1 and 3 in license Amendment Number 157, dated November 16, 2005. (ADAMS Accession No. ML053130275)

In Section 6 of the August 29, 2008 submittal, the following underlined change has been added:

6.10 NRC letter dated November 16, 2005, "Palo Verde Nuclear Generating Station, Units 1, 2, and 3 - Issuance of Amendments Re: Replacement of Steam Generators and Upgraded Power Operations and Associated Administrative Changes" (ADAMS Accession No. ML053130275)

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**ENCLOSURE, ATTACHMENT 1**

**Replacement Technical Specification  
Page Markups**

**Pages:**

**5.6-5A**

**5.6-5B**

## 5.6 Reporting Requirements

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- Rate; 3.2.3, Azimuthal Power Tilt; 3.2.4, DNBR; and 3.2.5, Axial Shape Index.]
16. CEN-191-P, "CETOP-D Code Structures and Modeling Methods for Calvert Cliffs 1 and 2." NRC approval in "Safety Evaluation Report related to Palo Verde Nuclear Generating Station, Unit 2 (PVNGS-2) Issuance of Amendment on Replacement of Steam Generators and Up-rated Power Operation, (September 29, 2003)." [Methodology for Specifications 3.1.1, Shutdown Margin - Reactor Trip Breakers Open; 3.1.2, Shutdown Margin-Reactor Trip Breakers Closed; 3.1.4, Moderator Temperature Coefficient; 3.2.1, Linear Heat Rate; 3.2.3, Azimuthal Power Tilt; 3.2.4, DNBR; and 3.2.5, Axial Shape Index.]
17. "Safety Evaluation related to Palo Verde Nuclear Generating Station, Unit 2 (PVNGS-2) Issuance of Amendment on Replacement of Steam Generators and Up-rated Power Operation, (September 29, 2003)" and **"Safety Evaluation related to Palo Verde Nuclear Generating Station, Units 1, 2, and 3 - Issuance of Amendments Re: Replacement of Steam Generators and Up-rated Power Operations and Associated Administrative Changes, (November 16, 2005)."** [Methodology for Specifications 3.1.1, Shutdown Margin - Reactor Trip Breakers Open; 3.1.2, Shutdown Margin-Reactor Trip Breakers Closed; 3.1.4, Moderator Temperature Coefficient; 3.1.5, CEA Alignment; 3.1.7, Regulating CEA Insertion Limits; 3.1.8, Part Length or Part Strength CEA Insertion Limits; 3.2.1, Linear Heat Rate; 3.2.3, Azimuthal Power Tilt; 3.2.4, DNBR; 3.2.5, Axial Shape Index; 3.3.12, Boron Dilution Alarm System (BDAS); and 3.9.1, Boron Concentration (Mode 6).]
18. CEN-310-P-A, "CPC Methodology Changes for the CPC Improvement Program." [Methodology for Specifications 3.2.1, Linear Heat Rate; 3.2.3, Azimuthal Power Tilt; 3.2.4, DNBR; and 3.2.5, Axial Shape Index.]
19. CENPD-183-A, "Loss of Flow, C-E Methods for Loss of Flow Analysis." [Methodology for Specifications 3.2.1, Linear Heat Rate; 3.2.3, Azimuthal Power Tilt; 3.2.4, DNBR; and 3.2.5, Axial Shape Index.]
20. CENPD-382-P-A, "Methodology for Core Designs Containing Erbium Burnable Absorbers." [Methodology for Specifications 3.1.1, Shutdown Margin - Reactor Trip Breakers Open; 3.1.2, Shutdown Margin-Reactor Trip Breakers Closed; and 3.1.4, Moderator Temperature Coefficient.]

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## 5.6 Reporting Requirements

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21. CEN-386-P-A, "Verification of the Acceptability of a 1-Pin Burnup Limit of 60 MWD/kgU for Combustion Engineering 16 x 16 PWR Fuel." [Methodology for Specifications 3.1.1, Shutdown Margin - Reactor Trip Breakers Open; 3.1.2, Shutdown Margin-Reactor Trip Breakers Closed; and 3.1.4, Moderator Temperature Coefficient.]

- c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling Systems (ECCS) limits, nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analysis are met.
- d. The COLR, including any mid cycle revisions or supplements, shall be provided upon issuance for each reload cycle to the NRC.

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(continued)

**Enclosure  
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**ENCLOSURE, ATTACHMENT 2**

**Replacement Retyped Technical Specification Pages**

**Pages:**

**5.6-6**

**5.6-7**



## 5.6 Reporting Requirements

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### 5.6.5 Core Operating Limits Report (COLR) (continued)

- Rate; 3.2.3, Azimuthal Power Tilt; 3.2.4, DNBR; and 3.2.5, Axial Shape Index.]
16. CEN-191-P, "CETOP-D Code Structures and Modeling Methods for Calvert Cliffs 1 and 2." NRC approval in "Safety Evaluation Report related to Palo Verde Nuclear Generating Station, Unit 2 (PVNGS-2) Issuance of Amendment on Replacement of Steam Generators and Upgraded Power Operation, (September 29, 2003)." [Methodology for Specifications 3.1.1, Shutdown Margin-Reactor Trip Breakers Open; 3.1.2, Shutdown Margin-Reactor Trip Breakers Closed; 3.1.4, Moderator Temperature Coefficient; 3.2.1, Linear Heat Rate; 3.2.3, Azimuthal Power Tilt; 3.2.4, DNBR; and 3.2.5, Axial Shape Index.]
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  18. CEN-310-P-A, "CPC Methodology Changes for the CPC Improvement Program." [Methodology for Specifications 3.2.1, Linear Heat Rate; 3.2.3, Azimuthal Power Tilt; 3.2.4, DNBR; and 3.2.5, Axial Shape Index.]
  19. CENPD-183-A, "Loss of Flow, C-E Methods for Loss of Flow Analysis." [Methodology for Specifications 3.2.1, Linear Heat Rate; 3.2.3, Azimuthal Power Tilt; 3.2.4, DNBR; and 3.2.5, Axial Shape Index.]
  20. CENPD-382-P-A, "Methodology for Core Designs Containing Erbium Burnable Absorbers." [Methodology for Specifications 3.1.1, Shutdown Margin-Reactor Trip Breakers Open; 3.1.2, Shutdown Margin-Reactor Trip Breakers Closed; and 3.1.4, Moderator Temperature Coefficient.]

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## 5.6 Reporting Requirements

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### 5.6.5 Core Operating Limits Report (COLR) (continued)

21. CEN-386-P-A, "Verification of the Acceptability of a 1-Pin Burnup Limit of 60 MWD/kgU for Combustion Engineering 16 x 16 PWR Fuel." [Methodology for Specifications  
3.1.1, Shutdown Margin-Reactor Trip Breakers Open;  
3.1.2, Shutdown Margin-Reactor Trip Breakers Closed; and  
3.1.4, Moderator Temperature Coefficient.]
- c. The core operating limits shall be determined such that all applicable limits (e.g., fuel thermal mechanical limits, core thermal hydraulic limits, Emergency Core Cooling Systems (ECCS) limits, nuclear limits such as SDM, transient analysis limits, and accident analysis limits) of the safety analysis are met.
- d. The COLR, including any mid cycle revisions or supplements, shall be provided upon issuance for each reload cycle to the NRC.

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