



Palo Verde Nuclear  
Generating Station

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**10 CFR 50.90**

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102-04623-CDM/TNW/JAP  
November 9, 2001

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Mail Station P1-37  
Washington, DC 20555-0001

**Subject: Palo Verde Nuclear Generating Station (PVNGS)  
Units 1, 2 and 3  
Docket Nos. STN 50-528/529/530  
Request for Amendment to Technical Specification 5.6.5b,  
Core Operating Limits Report (COLR)**

Dear Sirs:

Pursuant to 10 CFR 50.90, Arizona Public Service Company (APS) hereby requests an amendment to Technical Specification (TS) Section 5.0 for Palo Verde Nuclear Generating Station (PVNGS) Units 1, 2, and 3. This proposed amendment would revise TS 5.6.5b, Core Operating Limits Report (COLR) to add topical report CENPD-404-P-A, "Implementation of ZIRLO™ Cladding Material in CE Nuclear Power Fuel Assembly Designs," to the list of analytical methods used to determine core operating limits.

Based on the evaluation contained within this license amendment request (LAR), APS concludes that this change presents no significant hazards consideration under the standards set forth in 10 CFR 50.92 and accordingly, a finding by the Nuclear Regulatory Commission (NRC) of no significant hazards consideration is justified.

A list of commitments associated with this proposed amendment is provided in Attachment 3.

In accordance with the PVNGS Quality Assurance Program, the Plant Review Board and Offsite Safety Review Committee have reviewed and concurred with this proposed amendment. By copy of this letter, this request is being forwarded to the Arizona Radiation Regulatory Agency (ARRA) pursuant to 10 CFR 50.91(b)(1).

*Aool*

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Request for Amendment to Section 5.0 of Technical  
Specification 5.6.5b, Core Operating Limits Report (COLR)  
Page 2

APS requests that the enclosed LAR be reviewed and approved by February 15, 2002 to support APS plans to introduce ZIRLO™ clad fuel rods in PVNGS core reloads beginning in Spring 2002. Specifically, the first implementation of a ZIRLO™ core reload is planned for Unit 2, Cycle 11. APS requests to implement the proposed amendment within 60 days of its issuance.

Should you have any questions, please contact Thomas N. Weber at (623) 393-5764.

Sincerely,

*Angela Krainovich for David Mauldin*

CDM/TNW/JAP/kg

Enclosures:

- Notarized affidavit
- Arizona Public Service Company's Evaluation of the LAR

Attachments:

1. Proposed Technical Specification Changes (mark-up)
2. Proposed Technical Specification Changes (retyped)
3. List of Regulatory Commitments

cc: E. W. Merschoff  
L. R. Wharton  
J. H. Moorman  
A. V. Godwin (ARRA)

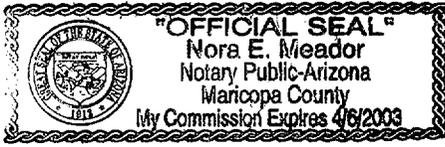
STATE OF ARIZONA        )  
  ) ss.  
COUNTY OF MARICOPA    )

I, Angela K. Krainik, represent that I am Director, Emergency Services, Arizona Public Service Company (APS), that the foregoing document has been signed by me on behalf of APS with full authority to do so, and that to the best of my knowledge and belief, the statements made therein are true and correct.

  
Angela K. Krainik

Sworn To Before Me This 9<sup>th</sup> Day Of November, 2001.

  
Notary Public



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Notary Commission Stamp

# **Arizona Public Service Company's Evaluation**

**Subject: Request for Amendment to Technical Specification  
5.6.5b, Core Operating Limits Report (COLR)**

1. DESCRIPTION
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## 1.0 DESCRIPTION

This letter is a request to amend Operating Licenses NPF-41, NPF-51, and NPF-74 for Palo Verde Nuclear Generating Station (PVNGS) Units 1, 2, and 3, respectively.

The proposed change would revise Operating Licenses NPF-41, NPF-51, and NPF-74 by amending the following specification in section 5.0 of the Technical Specifications (TS) for PVNGS Units 1, 2, and 3:

### TS 5.6.5b – “Core Operating Limits Report (COLR)”

The following reference will be added to the list of analytical methods used to determine the core operating limits:

13. CENPD-404-P-A, “Implementation of ZIRLO™ Cladding Material in CE Nuclear Power Fuel Assembly Designs”

This change is necessary to implement ZIRLO™ fuel rod cladding material into the fuel design for the PVNGS units. The first PVNGS unit fuel design to use ZIRLO™ cladding material will be Unit 2, Cycle 11 in March of 2002.

## 2.0 PROPOSED CHANGE

Core operating limits are established prior to each reload cycle, or prior to any remaining portion of a reload cycle, and are documented in the Core Operating Limits Report (COLR). TS 5.6.5b lists those analytical methods used to determine the core operating limits. The analytical methods have been previously reviewed and approved by the NRC. Topical report CENPD-404-P-A, “Implementation of ZIRLO™ Cladding Material in CE Nuclear Power Fuel Assembly Designs”, (Reference 1), will be added to the list contained in TS 5.6.5b. This topical report is necessary for the performance of design and safety analyses associated with the implementation of ZIRLO™ cladding material.

## 3.0 BACKGROUND

In a continuing effort to improve fuel performance, Westinghouse Electric Company (formerly Combustion Engineering (CE) Nuclear Power) is implementing ZIRLO™ cladding material into its fuel design for CE designed pressurized water reactors (PWRs). The use of ZIRLO™ clad fuel rods will substantially reduce waterside corrosion and, in particular, the spalling experienced by current Zircaloy-4 clad fuel rods as they reach higher burnup levels and duty cycles. Arizona Public Service Company (APS) plans to use ZIRLO™ clad fuel rods in the reactor cores for PVNGS 1, 2, and 3. TS 5.6.5b, Core Operating Limits Report (COLR), currently does not include a

methodology reference for the use of ZIRLO™ clad fuel rods in the core. The proposed Technical Specification change provides this reference.

Topical report CENPD-404-P-A (Reference 1) summarizes the material properties as they pertain to fuel rod cladding and provides an evaluation of these properties and the correlations for use in design and licensing analysis activities. CENPD-404-P-A also identifies the other CENP topical reports that are impacted by the implementation of ZIRLO™ cladding. Providing the information within CENPD-404-P-A that is needed to implement ZIRLO™ precluded the need to revise and have the NRC review each of these other individual topical reports. Nothing in any of the previously approved NRC topical reports has been changed. CENPD-404-P-A provides the direction necessary for applying the other topical reports to ZIRLO™ clad fuel. CENPD-404-P-A was generically accepted by the NRC for application to CENP designed Nuclear Power Plants and fuel on September 12, 2001 (Reference 2). PVNGS Units 1, 2, and 3 are CE designed Nuclear Power Plants and are supplied with CE designed nuclear fuel. As such, CENPD-404-P-A (Reference 1) and its NRC acceptance (Reference 2) are wholly applicable without exception to PVNGS Units 1, 2, and 3.

Topical report CENPD-404-P-A (Reference 1), requires the use of specific versions of the Westinghouse Emergency Core Cooling System (ECCS) performance evaluation models for Combustion Engineering (CE) designed Pressurized Water Reactors (PWRs). The evaluation models include CENPD-132, Supplement 4-P, "Calculative Methods for the CE Nuclear Power Large Break LOCA Evaluation Model" and CENPD-137, Supplement 2-P, "Calculative Methods for the CE Small Break LOCA Evaluation Model." These evaluation models have been generically accepted by the NRC for the analysis of ECCS performance of CE designed PWRs. These Topical Reports are currently listed in PVNGS TS 5.6.5b without a specific reference to the supplement number or date. The supplement number and date of these Topical Reports were removed in accordance with the PVNGS TS Amendment No. 137, dated October 15, 2001. The specific supplement number and date for the evaluation models referenced in CENPD-404-P-A (Reference 1) will be incorporated into the PVNGS Core Operating Limits Report (COLR) as specified in PVNGS TS 5.6.5b.

The Updated Final Safety Analysis (UFSAR) Section 4.2 will be revised under the 50.59 process to reflect the manufacturing and implementation of ZIRLO™ clad fuel rods. Additionally, the applicable sections of UFSAR Chapter 6 and Chapter 15 will be revised under the 50.59 process to reflect the re-analyses performed for the ZIRLO™ cladding material.

#### **4.0 TECHNICAL ANALYSIS**

TS 5.6.5b, Core Operating Limits Report (COLR), will be changed to add the analytical method, CENPD-404-P-A. The new methodology will provide the capability for the safety analyses to analyze ZIRLO™ clad fuel rods. In addition, it will allow the use of Westinghouse's Emergency Core Cooling System (ECCS) performance methodology

for CE designed PWRs, CENPD-132, Supplement 4-P, "Calculative Methods for the CE Nuclear Power Large Break LOCA Evaluation Model" and CENPD-137, Supplement 2-P, "Calculative Methods for the CE Small Break LOCA Evaluation Model." The subject methodologies have been reviewed and generically accepted by the NRC for application to CE designed PWRs. Since the affected methodologies will be used for safety analyses for which they were accepted, the proposed change does not impact the safety of the facility.

## 5.0 REGULATORY SAFETY ANALYSIS

### 5.1 No Significant Hazards Consideration

Arizona Public Service Company (APS) has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The proposed change allows the use of methods required for the implementation of ZIRLO™ clad fuel rods in PVNGS Units 1, 2, and 3. The use of this methodology will not increase the probability of an accident because the plant systems will not be operated outside of design limits, no different equipment will be operated, and system interfaces will not change.

As ZIRLO™ material is introduced to the reactor, transition cores will exist in which ZIRLO™ and Zircaloy-4 clad fuel assemblies are co-resident. Fuel assemblies clad with each material will be evaluated based on the approved topical reports.

The use of this additional methodology will not increase the consequences of an accident because Limiting Conditions of Operation (LCOs) will continue to restrict operation to within the regions that provide acceptable results, and Reactor Protection System (RPS) trip setpoints will restrict plant transients so that the consequences of accidents will be acceptable. In addition, the consequences of the accidents will be calculated using NRC accepted methodologies.

The transition cores that will exist as ZIRLO™ clad fuel is introduced to the reactor will not increase the consequences of an accident. Operation within the LCOs and RPS setpoints will continue to restrict plant transients so that the consequences of accidents will be acceptable.

Therefore, the proposed change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed change does not add any new equipment, modify any interfaces with any existing equipment, alter the equipment's function, or change the method of operating the equipment. The proposed change does not alter plant conditions in a manner that could affect other plant components. The proposed change does not cause any existing equipment to become an accident initiator. The ZIRLO™ clad fuel rod design does not introduce features that could initiate an accident.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

Safety Limits ensure that Specified Acceptable Fuel Design Limits (SAFDLs) are not exceeded during steady state operation, normal operational transients and anticipated operational occurrences. All fuel limits and design criteria shall be met based on the approved methodologies defined in the topical reports. The RPS in combination with the LCOs will continue to prevent any anticipated combination of transient conditions for reactor coolant system temperature, pressure, and thermal power level that would result in a violation of the Safety Limits. Therefore, the proposed changes will have no impact on the margins as defined in the Technical Specification bases.

The safety analyses determine the LCO settings and RPS setpoints that establish the initial conditions and trip setpoints, which ensure that the Design Basis Events (Postulated Accidents and Anticipated Operational Occurrences) analyzed in the Updated Final Safety Analysis Report (UFSAR) produce acceptable results. In addition, all fuel limits and design criteria shall be satisfied. The Design Basis Events that are impacted by the implementation of ZIRLO™ cladding will be analyzed using the NRC accepted methodology described in CENPD-404-P-A.

The change in the fuel rod cladding material and the use of the ECCS performance evaluation models, CENPD-132, Supplement 4-P, "Calculative Methods for the CE Nuclear Power Large Break LOCA Evaluation Model" and CENPD-137, Supplement 2-P, "Calculative Methods for the CE Small Break LOCA Evaluation Model" will not involve a reduction in the margin of safety because LCOs and Limiting Safety System Settings (LSSS) will be adjusted, if necessary, to maintain acceptable results for the impacted Design Basis Events.

Therefore, this change does not involve a significant reduction in a margin of safety.

Based on the above, Arizona Public Service Company (APS) concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

#### Applicable Regulatory Requirements/Criteria

The regulatory basis for TS 5.6.5b, "Core Operating Limits Report (COLR)," is to ensure that the analytical methods used to determine the core operating limits have been previously reviewed and approved by the NRC. NRC Safety Evaluation of Topical Report CENPD-404-P, Revision 0, "Implementation of ZIRLO Material Cladding in CE Nuclear Power Fuel Assembly Designs", (Reference 2), reviewed and approved the use of ZIRLO™ cladding material for Combustion Engineering (CE) designed plants.

The regulatory basis for TS 4.2.1, "Reactor Core – Fuel Assemblies," is to describe the fuel assembly cladding material that is allowed to be used within the reactor core. TS 4.2.1 currently allows for ZIRLO™ clad fuel rods to be used for the fuel assemblies.

10 CFR 50.44, "Standards for combustible gas control system in light-water-cooled power reactors," allows for zircaloy or ZIRLO™ cladding material.

10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," allows for zircaloy or ZIRLO™ cladding material.

10 CFR 50, Appendix K, "ECCS (Emergency Core Cooling System) Evaluation Models," describes the required and acceptable features of the evaluation models used for Loss of Coolant Accidents (LOCA). APS will use evaluation models that have already been generically approved by the

NRC for large and small break LOCAs. These evaluation models incorporated the use of ZIRLO™ cladding materials in the LOCA analysis. The specific supplement number and date for these evaluation models referenced in CENPD-404-P-A (Reference 1) will be incorporated into the PVNGS Core Operating Limits Report (COLR) as specified in PVNGS TS 5.6.5b.

## 5.2 APS Response to NRC Conditions in the Safety Evaluation for CENPD-404-P

Topical report CENPD-404-P-A (Reference 1) describes the implementation of ZIRLO™ fuel rod cladding material properties and correlations in Westinghouse Electric Company (WEC) design and safety analysis methodologies for CE designed PWRs and fuel. It was generically accepted by the Nuclear Regulatory Commission (NRC) for application to CE designed PWRs and fuel on September 12, 2001 (Reference 2). The NRC safety evaluation (Reference 2) stated that it is acceptable for WEC to use ZIRLO™ as the cladding material for CENP-designed plants subject to conditions. The conditions and APS response to each condition are as follows:

### Condition 1

The corrosion limit as predicted by the best-estimate model will remain below 100 microns for all locations of the fuel.

#### APS Response:

The maximum allowable corrosion limit of 100 microns will be added to the PVNGS Updated Final Safety Analysis (UFSAR). APS will calculate the corrosion thickness using the best estimate models and methods described in Reference 1. Contained in reference 1 is a letter from P. W. Richardson (WEC) to J. S. Cushing (NRC), "Response to Requests for Additional Information on Topical Report CENPD-404-P, Rev. 0", LD-2001-0045, Rev. 0, August 10, 2001. This letter specifically addresses the best estimate models for predicting corrosion limits.

### Condition 2

All the conditions listed in the SEs for all the CENPD methodologies used for ZIRLO fuel analysis will continue to be met, except that the use of ZIRLO cladding in addition to Zircaloy-4 cladding is now approved.

APS Response:

APS will continue to abide by the conditions listed in the safety evaluations for all CENPD methodologies used for the analysis of ZIRLO™ fuel. This will be accomplished through APS' Quality Assurance (QA) process that is employed for use of methodologies.

Condition 3

All CENP methodologies will be used only within the range for which ZIRLO data was acceptable and for which the verifications discussed in CENPD-404-P and responses to requests for additional information were performed.

APS Response:

ZIRLO™ data ranges for the methodologies in which they are used will be verified through APS' Quality Assurance (QA) process that is employed for use of methodologies.

Condition 4

Until data is available demonstrating the performance of ZIRLO cladding in CENP designed plants, the fuel duty will be limited for each CENP designed plant with some provision for adequate margin to account for variations in core design (e.g., cycle length, plant operating conditions, etc). Details of this condition will be addressed on a plant specific basis during the approval to use ZIRLO in a specific plant.

APS Response:

APS will limit the fuel duty for PVNGS with a provision for adequate margin to account for variations in core design (e.g., cycle length, plant operating conditions, etc). This limit will be applicable until data is available demonstrating the performance of ZIRLO™ cladding at PVNGS.

APS will restrict the modified Fuel Duty Index (FDIm) of each ZIRLO™ clad fuel pin to 110% of the maximum fuel pin value previously experienced at PVNGS plants in the aggregate. For a fraction of the fuel pins in a limited number of assemblies (4 or 8), APS will restrict the fuel duty of ZIRLO™ clad fuel pins to 120% of the maximum fuel pin value previously experienced at PVNGS plants in the aggregate.

The maximum fuel pin value of the FDIm previously experienced at PVNGS (not including any current reactor designs), is approximately 600. This value will be confirmed in a qualified analysis and used to establish

the baseline FDI<sub>m</sub> and the exact FDI<sub>m</sub> limits prior to the first use of ZIRLO™ fuel. This baseline FDI<sub>m</sub> will remain unchanged during the process of obtaining data.

If the modified Fuel Duty Index and measured oxide thickness correlate as expected or is conservative relative to predictions, APS would no longer restrict the FDI<sub>m</sub> except as required to meet the 100 micron oxide limit. The results from these inspections and measurements would be provided to the NRC. Alternatively, if the measured oxide is significantly greater than predicted, APS will provide the data and justification to the NRC prior to an increase to the limits on FDI<sub>m</sub>.

#### Condition 5

The burnup limit for this approval is 60 GWD/MTU.

#### APS Response:

The maximum radial integrated rod burnup limit for ZIRLO™ clad fuel assemblies of 60 GWD/MTU will be added to the PVNGS UFSAR.

## **6.0 ENVIRONMENTAL CONSIDERATION**

The proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environment impact statement or environmental assessment need be prepared in connection with the proposed amendment.

## **7.0 REFERENCES**

#### Reference:

1. CENPD-404-P-A, Revision 0, "Implementation of ZIRLO™ Cladding Material in CE Nuclear Power Fuel Designs," dated November 2001
2. Safety Evaluation of Topical Report CENPD-404-P, Revision 0, "Implementation of ZIRLO Material Cladding in CE Nuclear Power Fuel Assembly Designs," dated September 12, 2001 and Correction To Safety Evaluation on Topical Report CENPD-404-P, Revision 0, "Implementation of ZIRLO Material Cladding in CE Nuclear Power Fuel Assembly Designs," dated October 17, 2001

3. Letter from Phillip W. Richardson, Westinghouse Electric Company LLC to NRC Document Control Desk, August 27, 2001.

Precedent:

1. Calvert Cliffs Nuclear Power Plant, License Amendment Request (LAR):  
"Incorporate Methodology References for the Implementation of ZIRLO™ Clad Fuel Rods into the Technical Specifications, dated July 27, 2001.

This request proposes to add CENPD-404-P, "Implementation of ZIRLO™ Cladding Material in CE Nuclear Power Fuel Designs," to the list of those analytical methods used to determine the core operating limits that are reviewed and approved by the NRC and are contained in the Technical Specifications (TS). This is similar to what APS is requesting. Additionally, the Calvert Cliffs Nuclear Power Plant LAR will incorporate into their TS the small and large break LOCA evaluation models. APS will incorporate the updated versions of these models in the PVNGS COLRs.

This request had not received NRC approval at the time of this APS request.

**Proposed Technical Specification Pages (mark-up)**

**Units 1, 2, and 3;**

**Page 5.6-5**

## 5.6 Reporting Requirements (continued)

5.6.5 Core Operating Limits Report (COLR) (continued)

7. Letter: O.D. Parr (NRC) to F. M. Stern (CE), dated June 13, 1975 (NRC Staff Review of the Combustion Engineering ECCS Evaluation Model). NRC approval for: 5.6.5.b.6.
  8. Letter: K. Kniel (NRC) to A. E. Scherer (CE), dated September 27, 1977 (Evaluation of Topical Reports CENPD-133, Supplement 3-P and CENPD-137, Supplement 1-P). NRC approval for 5.6.5.b.6.
  9. "Fuel Rod Maximum Allowable Pressure," CEN-372-P-A, (Methodology for Specification 3.2.1, Linear Heat Rate).
  10. Letter: A. C. Thadani (NRC) to A. E. Scherer (CE), dated April 10, 1990, ("Acceptance for Reference CE Topical Report CEN-372-P"). NRC approval for 5.6.5.b.9.
  11. "Arizona Public Service Company PWR Reactor Physics Methodology Using CASMO-4/SIMULATE-3," [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; 3.1.7, Regulating CEA Insertion Limits and 3.9.1, Boron Concentration (Mode 6)].
  12. "Technical Manual for the CENTS Code," CE-NPD 282-P-A, Volumes 1-3, [Methodology for Specifications 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 CEA Insertion Limits and 3.2.3, Azimuthal Power Tilt-  $T_4$ ].
  13. CENPD-404-P-A, "Implementation of ZIRLO™ Cladding Material in CE Nuclear Power Fuel Assembly Designs.
- 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.

(continued)

**Proposed Technical Specification Pages (retyped)**

**Units 1, 2, and 3;**

**Page 5.6-5**

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## 5.6 Reporting Requirements (continued)

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

7. Letter: O.D. Parr (NRC) to F. M. Stern (CE), dated June 13, 1975 (NRC Staff Review of the Combustion Engineering ECCS Evaluation Model). NRC approval for: 5.6.5.b.6.
  8. Letter: K. Kniel (NRC) to A. E. Scherer (CE), dated September 27, 1977 (Evaluation of Topical Reports CENPD-133, Supplement 3-P and CENPD-137, Supplement 1-P). NRC approval for 5.6.5.b.6.
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  12. "Technical Manual for the CENTS Code," CE-NPD 282-P-A, Volumes 1-3, [Methodology for Specifications 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 CEA Insertion Limits and 3.2.3, Azimuthal Power Tilt-  $T_q$ ].
  13. CENPD-404-P-A, "Implementation of ZIRLO™ Cladding Material in CE Nuclear Power Fuel Assembly Designs.
- 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.

(continued)

## List of Regulatory Commitments

The following table identified those actions committed to by APS in this document. Any other statements in this submittal are provided for information purposes and are not considered to be regulatory commitments. Please direct questions regarding these commitments to Thomas N. Weber at (623) 393-5764.

REGULATORY COMMITMENT
<p>1. APS will limit the fuel duty for PVNGS with a provision for adequate margin to account for variations in core design (e.g., cycle length, plant operating conditions, etc). This limit will be applicable until data is available demonstrating the performance of ZIRLO™ cladding at PVNGS.</p>
<p>1. Revise the PVNGS UFSAR (complete an LDCR) as needed to reflect the changes contained with the TS change to allow the use of ZIRLO™ fuel cladding material. The change shall include, but not limited to, the following items:</p> <ul style="list-style-type: none"> <li>• The corrosion limit, as predicted by the best-estimate model, will remain below 100 microns for all locations of the fuel.</li> <li>• The maximum radial integrated rod burnup is limited to 60 GWD/MTU for ZIRLO™ clad fuel.</li> <li>• Section 4.2 will be revised to reflect the manufacturing and implementation of ZIRLO™ clad fuel rods.</li> <li>• The applicable sections of Chapter 6 and Chapter 15 will be revised to reflect the re-analyses performed using ZIRLO™ cladding material properties.</li> </ul>