

March 9, 1988

Docket Nos.: STN 50-529  
and STN 50-530

Mr. E. E. Van Brunt, Jr.  
Executive Vice President  
Arizona Nuclear Power Project  
Post Office Box 52034  
Phoenix, Arizona 85072-2034

Dear Mr. Van Brunt:

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SUBJECT: ISSUANCE OF AMENDMENT NO. 18 TO FACILITY OPERATING LICENSE NO. NPF-51  
AND AMENDMENT NO. 6 TO FACILITY OPERATING LICENSE NO. NPF-74, FOR  
THE PALO VERDE NUCLEAR GENERATING STATION, UNITS 2 AND 3, RESPECTIVELY  
(TAC NOS. 66182 AND 66183)

The Commission has issued the subject Amendments, which are enclosed, to the  
Facility Operating Licenses for the Palo Verde Nuclear Generating Station, Units  
2 and 3. The Amendments consist of a change to the Technical Specifications  
(Appendix A to each license) in response to your application transmitted by  
letter dated September 14, 1987, as revised by letter dated October 1, 1987.

The Amendments revise Section 5.3.1 of the Technical Specifications by increasing  
the maximum enrichment for reload fuel from 4.0 to 4.05 weight percent U-235.

A copy of the related Safety Evaluation is also enclosed. A Notice of  
Issuance will be included in the Commission's next regular bi-weekly Federal  
Register notice.

Sincerely,

original signed by

E. A. Licitra, Senior Project Manager  
Project Directorate V  
Division of Reactor Projects - III,  
IV, V and Special Projects

Enclosures:

1. Amendment No. 18 to NPF-51
2. Amendment No. 6 to NPF-74
3. Safety Evaluation

cc: See next page

\*See previous concurrence

*DRSP/PDV	*DRSP/PDV
EALicitra:dr	JLee
02/09/88	02/18/88

*caz*  
*3/9/88*

\*OGC- *Beth*  
02/24/88

\*DRSP/PDV  
*[Signature]*  
GWK/ton  
02/9/88

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P PDR

Mr. E. E. Van Brunt, Jr.  
Arizona Nuclear Power Project

Palo Verde

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Phoenix, Arizona 85003



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-529

PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No.  
License No. NPF-51

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment, dated September 14, 1987, as revised by letter dated October 1, 1987, by the Arizona Public Service Company (APS) on behalf of itself and the Salt River Project Agricultural Improvement and Power District, El Paso Electric Company, Southern California Edison Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority (licensees), complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of Act, and the regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public;
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

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PDR

2. Accordingly, the license is amended by a change to the Technical Specifications as indicated in the enclosure to this license amendment, and paragraph 2.C(2) of Facility Operating License No. NPF-51 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 18, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this license. APS shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

  
George W. Knighton, Director  
Project Directorate V  
Division of Reactor Projects - III,  
IV, V and Special Projects

Enclosure:  
Change to the Technical  
Specifications

Date of Issuance: March 9, 1988

March 9, 1988

ENCLOSURE TO LICENSE AMENDMENT

AMENDMENT NO. 18 TO FACILITY OPERATING LICENSE NO. NPF-51

DOCKET NO. STN 50-529

Replace the following page of the Appendix A Technical Specifications with the enclosed page. The revised page is identified by Amendment number and contains a vertical line indicating the area of change. Also to be replaced is the following overleaf page to the amended page.

Amendment Page

5-5

Overleaf Page

5-6

## DESIGN FEATURES

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### 5.3 REACTOR CORE

#### FUEL ASSEMBLIES

5.3.1 The reactor core shall contain 241 fuel assemblies with each fuel assembly containing 236 fuel rods or burnable poison rods clad with Zircaloy-4. Each fuel rod shall have a nominal active fuel length of 150 inches and contain a maximum total weight of approximately 1950 grams uranium. Each burnable poison rod shall have a nominal active poison length of 136 inches. The initial core loading shall have a maximum enrichment of 3.35 weight percent U-235. Reload fuel shall be similar in physical design to the initial core loading and shall have a maximum enrichment of 4.05 weight percent U-235.\*

#### CONTROL ELEMENT ASSEMBLIES

5.3.2 The reactor core shall contain 76 full-length and 13 part-length control element assemblies.

### 5.4 REACTOR COOLANT SYSTEM

#### DESIGN PRESSURE AND TEMPERATURE

5.4.1 The Reactor Coolant System is designed and shall be maintained:

- a. In accordance with the code requirements specified in Section 5.2 of the FSAR with allowance for normal degradation pursuant of the applicable surveillance requirements,
- b. For a pressure of 2500 psia, and
- c. For a temperature of 650°F, except for the pressurizer which is 700°F.

#### VOLUME

5.4.2 The total water and steam volume of the Reactor Coolant System is 13,900 + 300/-0 cubic feet at a nominal  $T_{avg}$  of 593°F.

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\*No fuel with an enrichment greater than 4.0 weight percent U-235 shall be stored in a high density mode in the spent fuel storage facility.

## DESIGN FEATURES

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### 5.5 METEOROLOGICAL TOWER LOCATION

5.5.1 The meteorological tower shall be located as shown on Figure 5.1-1.

### 5.6 FUEL STORAGE

#### 5.6.1 CRITICALITY

5.6.1.1 The spent fuel storage racks are designed and shall be maintained with:

- a. A  $k_{eff}$  equivalent to less than or equal to 0.95 when flooded with unborated water, which includes a conservative allowance of 2.6%  $\Delta k/k$  for uncertainties as described in Section 9.1 of the FSAR.
- b. A nominal 9.5 inch center-to-center distance between fuel assemblies placed in the storage racks in a high density configuration.

5.6.1.2 The  $k_{eff}$  for new fuel for the first core loading stored dry in the spent fuel storage racks shall not exceed 0.98 when aqueous foam moderation is assumed.

#### DRAINAGE

5.6.2 The spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 137 feet - 6 inches.

#### CAPACITY

5.6.3 The spent fuel storage pool is designed and shall be maintained with a storage capacity limited to no more than 1329 fuel assemblies.

### 5.7 COMPONENT CYCLIC OR TRANSIENT LIMITS

5.7.1 The components identified in Table 5.7-1 are designed and shall be maintained within the cyclic or transient limits of Tables 5.7-1 and 5.7-2.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-530

PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 6  
License No. NPF-74

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment, dated September 14, 1987, as revised by letter dated October 1, 1987, by the Arizona Public Service Company (APS) on behalf of itself and the Salt River Project Agricultural Improvement and Power District, El Paso Electric Company, Southern California Edison Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority (licensees), complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's regulations set forth in 10 CFR Chapter I;
  - B. The facility will operate in conformity with the application, the provisions of Act, and the regulations of the Commission;
  - C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
  - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public;
  - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by a change to the Technical Specifications as indicated in the enclosure to this license amendment, and paragraph 2.C(2) of Facility Operating License No. NPF-74 is hereby amended to read as follows:

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 6, and the Environmental Protection Plan contained in Appendix B, are hereby incorporated into this license. APS shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

  
George W. Knighton, Director  
Project Directorate V  
Division of Reactor Projects - III,  
IV, V and Special Projects

Enclosure:  
Change to the Technical  
Specifications

Date of Issuance: March 9, 1988

March 9, 1988

ENCLOSURE TO LICENSE AMENDMENT

AMENDMENT NO. 6 TO FACILITY OPERATING LICENSE NO. NPF-74

DOCKET NO. STN 50-530

Replace the following page of the Appendix A Technical Specifications with the enclosed page. The revised page is identified by Amendment number and contains a vertical line indicating the area of change. Also to be replaced is the following overleaf page to the amended page.

Amendment Page

5-5

Overleaf Page

5-6

## DESIGN FEATURES

---

### 5.3 REACTOR CORE

#### FUEL ASSEMBLIES

5.3.1 The reactor core shall contain 241 fuel assemblies with each fuel assembly containing 236 fuel rods or burnable poison rods clad with Zircaloy-4. Each fuel rod shall have a nominal active fuel length of 150 inches and contain a maximum total weight of approximately 1950 grams uranium. Each burnable poison rod shall have a nominal active poison length of 136 inches. The initial core loading shall have a maximum enrichment of 3.35 weight percent U-235. Reload fuel shall be similar in physical design to the initial core loading and shall have a maximum enrichment of 4.05 weight percent U-235.\*

#### CONTROL ELEMENT ASSEMBLIES

5.3.2 The reactor core shall contain 76 full-length and 13 part-length control element assemblies.

### 5.4 REACTOR COOLANT SYSTEM

#### DESIGN PRESSURE AND TEMPERATURE

5.4.1 The Reactor Coolant System is designed and shall be maintained:

- a. In accordance with the code requirements specified in Section 5.2 of the FSAR with allowance for normal degradation pursuant of the applicable surveillance requirements,
- b. For a pressure of 2500 psia, and
- c. For a temperature of 650°F, except for the pressurizer which is 700°F.

#### VOLUME

5.4.2 The total water and steam volume of the Reactor Coolant System is 13,900 + 300/-0 cubic feet at a nominal  $T_{avg}$  of 593°F.

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\*No fuel with an enrichment greater than 4.0 weight percent U-235 shall be stored in a high density mode in the spent fuel storage facility.

## DESIGN FEATURES

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5.5.1 The meteorological tower shall be located as shown on Figure 5.1-1.

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5.6.1.1 The spent fuel storage racks are designed and shall be maintained with:

- a. A  $k_{eff}$  equivalent to less than or equal to 0.95 when flooded with unborated water, which includes a conservative allowance of 2.6% delta  $k/k$  for uncertainties as described in Section 9.1 of the FSAR.
- b. A nominal 9.5 inch center-to-center distance between fuel assemblies placed in the storage racks in a high density configuration.

5.6.1.2 The  $k_{eff}$  for new fuel for the first core loading stored dry in the spent fuel storage racks shall not exceed 0.98 when aqueous foam moderation is assumed.

#### DRAINAGE

5.6.2 The spent fuel storage pool is designed and shall be maintained to prevent inadvertent draining of the pool below elevation 137 feet - 6 inches.

#### CAPACITY

5.6.3 The spent fuel storage pool is designed and shall be maintained with a storage capacity limited to no more than 1329 fuel assemblies.

### 5.7 COMPONENT CYCLIC OR TRANSIENT LIMITS

5.7.1 The components identified in Table 5.7-1 are designed and shall be maintained within the cyclic or transient limits of Tables 5.7-1 and 5.7-2.



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 18 TO FACILITY OPERATING LICENSE NO. NPF-51  
AND AMENDMENT NO. 6 TO FACILITY OPERATING LICENSE NO. NPF-74  
ARIZONA PUBLIC SERVICE COMPANY, ET AL.  
PALO VERDE NUCLEAR GENERATING STATION, UNIT NOS. 2 AND 3  
DOCKET NOS. STN 50-529 AND 50-530

1.0 INTRODUCTION

By letter dated September 14, 1987, as revised by letter dated October 1, 1987, the Arizona Public Service Company (APS) on behalf of itself, the Salt River Project Agricultural Improvement and Power District, Southern California Edison Company, El Paso Electric Company, Public Service Company of New Mexico, Los Angeles Department of Water and Power, and Southern California Public Power Authority (licensees), requested a change to the Technical Specifications for the Palo Verde Nuclear Generating Station, Units 2 and 3 (Appendix A to Facility Operating License Nos. NPF-51 and NPF-74, respectively). The proposed change would revise the maximum enrichment for reload fuel from 4.0 to 4.05 weight percent U-235.

2.0 EVALUATION

The licensees have requested that the maximum enrichment for reload fuel for Palo Verde, Units 2 and 3 be increased from 4.0 to 4.05 weight percent U-235 and that Technical Specification 5.3.1 be revised accordingly. The reason for the request is to allow the desired fuel management for future 18-month equilibrium cycles. In support of this proposed change, the licensees have provided the following information.

The accidents which are affected by increasing the fuel enrichment are those dealing with storage of new and spent fuel. The Palo Verde Final Safety Analysis Report (FSAR) provides the results of accident analyses for both storage facilities.

The licensees' submittal includes a letter by Combustion Engineering, dated May 27, 1987, which verifies that the original analyses of the new fuel, spent fuel (except as noted below) and intermediate racks, as well as the fuel elevator, fuel upender and transfer machine were all performed for 4.30 weight percent U-235 fuel. Since the  $k_{eff}$  values based on the storage of 4.30 weight percent U-235 fuel meet the NRC acceptance criteria of no greater than 0.95 for fully flooded (unborated) conditions and 0.98 for optimum moderation conditions, the Palo Verde fuel storage facilities are acceptable for the storage of 4.05 weight percent U-235 fuel.

One exception is the analysis of the spent fuel racks with neutron poison (boron) boxes in the cells. This high density mode was analyzed for a maximum enrichment of 4.0 weight percent U-235. Therefore, if a future decision is made to use this mode for storage of higher enriched fuel, an analysis will be required for this higher enrichment. A footnote has been added to the licensees' proposed Technical Specification 5.3.1 to make this point clear.

Therefore, on the basis of the above evaluation, the staff concludes that the proposed change to Technical Specification 5.3.1 is acceptable.

### 3.0 CONTACT WITH STATE OFFICIAL

The Arizona Radiation Regulatory Agency was advised of the proposed determination of no significant hazards consideration with regard to this change. No comments were received.

### 4.0 ENVIRONMENTAL CONSIDERATION

The amendments involves a change in the installation or use of facility components located within the restricted areas as defined in 10 CFR 20. The staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued proposed findings that the amendments involve no significant hazards consideration, and there has been no public comment on such findings. Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b) no environmental impact statement or environmental assessment needs to be prepared in connection with the issuance of these amendments.

### 5.0 CONCLUSION

The staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of these amendments will not be inimical to the common defense and security or to the health and safety of the public. We, therefore, conclude that the proposed change is acceptable.

Principal Contributor: E. A. Licitra

Dated: March 9, 1988