

May 20, 1988

Docket Nos.: STN 50-528, 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

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Dear Mr. Van Brunt:

SUBJECT: ISSUANCE OF AMENDMENT NO. 34 TO FACILITY OPERATING LICENSE NO. NPF-41, AMENDMENT NO. 21 TO FACILITY OPERATING LICENSE NO. NPF-51, AND AMENDMENT NO. 8 TO FACILITY OPERATING LICENSE NO. NPF-74, FOR THE PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3, RESPECTIVELY (TAC NOS. 67816, 67817 AND 67818)

The Commission has issued the subject Amendments, which are enclosed, to the Facility Operating Licenses for Palo Verde Nuclear Generating Station, Units 1, 2, and 3. The Amendments consist of a change to the Technical Specifications in response to your application dated April 8, 1988.

The Amendments revise Technical Specification 5.3.1, "Fuel Assemblies," for each unit to provide for limited substitution of fuel rods by filler rods consisting of Zircaloy-4 or stainless steel, or by vacancies, if justified by a cycle specific reload analysis. Specification 5.3.1 for Unit 1 is further revised to reflect a limitation on fuel storage which was established in Amendment No. 24 to NPF-41, dated October 21, 1987. This letter change also makes the Unit 1 Specification consistent with Units 2 and 3.

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

8806020200 880520
PDR ADOCK 0500052B
P PDR

Enclosures:

1. Amendment No. 34 to NPF-41
2. Amendment No. 21 to NPF-51
3. Amendment No. 8 to NPF-74
4. Safety Evaluation

cc: See next page

DRSP/PDV *EAL*
EALicitra
4/18/88

DRSP/PDV
JLee
4/18/88

OGC-WF *ML*
ML
4/22/88

DRSP/D:PDV *GW*
GWKnighton
5/3/88



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

May 20, 1988

Docket Nos.: STN 50-528, 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

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SUBJECT: ISSUANCE OF AMENDMENT NO. 34 TO FACILITY OPERATING LICENSE NO. NPF-41, AMENDMENT NO. 21 TO FACILITY OPERATING LICENSE NO. NPF-51, AND AMENDMENT NO. 8 TO FACILITY OPERATING LICENSE NO. NPF-74, FOR THE PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3, RESPECTIVELY (TAC NOS. 67816, 67817 AND 67818)

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Sincerely,

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

Enclosures:

1. Amendment No. 34 to NPF-41
2. Amendment No. 21 to NPF-51
3. Amendment No. 8 to NPF-74
4. Safety Evaluation

cc: See next page

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

Palo Verde

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Chairman
Arizona Corporation Commission
Post Office-Box 6019
Phoenix, Arizona 85003

Arizona Radiation Regulatory Agency
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Phoenix, Arizona 85040

Mr. Charles Tedford, Director
Arizona Radiation Regulatory Agency
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Phoenix, Arizona 85040

Chairman
Maricopa County Board of Supervisors
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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 50-528

PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 34
License No. NPF-41

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment, dated April 8, 1988, 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 the 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; and
 - 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-41 is hereby amended to read as follows:

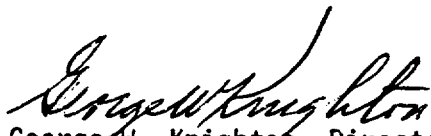
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PDR ADOCK 0500052B
P PDR

(2) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 34, 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: May 20, 1988

ENCLOSURE TO LICENSE AMENDMENT

AMENDMENT NO. 34 TO FACILITY OPERATING LICENSE NO. NPF-41

DOCKET NO. STN 50-528

Replace the following page of the Appendix A Technical Specifications with the enclosed page. The revised page is identified by Amendment number and contains vertical lines 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 normally containing 236 fuel rods or burnable poison rods clad with Zircaloy-4 except that limited substitution of fuel rods by filler rods consisting of Zircaloy-4 or stainless steel or by vacancies may be made if justified by a cycle specific reload analysis. 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:
- 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,
 - For a pressure of 2500 psia, and
 - 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.

*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

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 50-529

PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 21
License No. NPF-51

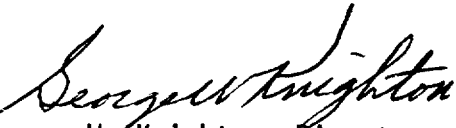
1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment, dated April 8, 1988, by the Arizona Public Service Company (APS) on behalf of itself and the Salt River Project Agricultural Improvement and Power District, El Paso Electric Company, Southern California 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 the 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; and
 - 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-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. 21, 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: May 20, 1988

May 20, 1988

ENCLOSURE TO LICENSE AMENDMENT

AMENDMENT NO. 21 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 vertical lines 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 normally containing 236 fuel rods or burnable poison rods clad with Zircaloy-4 except that limited substitution of fuel rods by filler rods consisting of Zircaloy-4 or stainless steel or by vacancies may be made if justified by a cycle specific reload analysis. 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.

*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

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. 8
License No. NPF-74

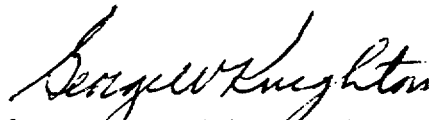
1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment, dated April 8, 1988, by the Arizona Public Service Company (APS) on behalf of itself and the Salt River Project Agricultural Improvement and Power District, El Paso Electric Company, Southern California 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 the 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; and
 - 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. 8, 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: May 20, 1988

May 20, 1988

ENCLOSURE TO LICENSE AMENDMENT

AMENDMENT NO. 8 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 vertical lines 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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DESIGN PRESSURE AND TEMPERATURE

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 34 TO FACILITY OPERATING LICENSE NO. NPF-41,
AMENDMENT NO. 21 TO FACILITY OPERATING LICENSE NO. NPF-51
AND AMENDMENT NO. 8 TO FACILITY OPERATING LICENSE NO. NPF-74
ARIZONA PUBLIC SERVICE COMPANY, ET AL.
PALO VERDE NUCLEAR GENERATING STATION, UNIT NOS. 1, 2 AND 3
DOCKET NOS. STN 50-528, STN 50-529 AND STN 50-530

1.0 INTRODUCTION

By letter dated April 8, 1988, 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 1, 2, and 3 (Appendix A to Facility Operating License Nos. NPF-41, NPF-51 and NPF-74, respectively). The proposed change would revise Technical Specification 5.3.1 for each unit to include in the design description of the fuel assemblies, assemblies containing a limited number of Zircaloy-4 or stainless steel filler rods, or vacancies, in lieu of fuel rods for use in reload cores.

2.0 EVALUATION

Technical Specification 5.3.1, "Fuel Assemblies," describes the design characteristics of the fuel assemblies to be included in the reactor core. The Specification states, in part, that the reactor core shall contain 241 fuel assemblies with each assembly containing 236 fuel rods or burnable poison rods clad with Zircaloy-4. In the April 8, 1988 amendment request, the licensees propose to modify the above statement by including the following exception:

"except that limited substitution of fuel rods by filler rods consisting of Zircaloy-4 or stainless steel, or by vacancies, may be made if justified by a cycle specific reload analysis."

The purpose of the proposed amendment is to allow the use of reconstituted fuel assemblies in which leaking fuel pins are removed and replaced with filler rods or the position is left vacant. In the case of Palo Verde, Unit 2, there is an immediate need for this change since the unit is currently in a refueling outage and eight fuel assemblies require reconstitution to replace leaking fuel pins. The change is also being requested

for Palo Verde, Units 1 and 3 in the event that reconstitution of fuel assemblies becomes necessary for these units in the future.

Palo Verde is a CESSAR System 80 plant and references the CESSAR FSAR (Docket No. STN 50-460) for the nuclear steam supply system design. Therefore, the Palo Verde fuel design is discussed in the CESSAR FSAR.

In support of the amendment request, the licensees provided the following information. Section 5.3.1 of Chapter 16 (dealing with Technical Specifications) in the CESSAR FSAR states that each fuel assembly shall contain a maximum of 236 fuel rods or burnable poison rods clad with Zircaloy-4. Therefore a lesser number of those rods can be used to accommodate reconstituted fuel assemblies. Sections 4.2.1.1.A.3 and 4.2.2.1 of the CESSAR FSAR discuss the use of reconstituted fuel assemblies in the reactor core. Furthermore, the methodology used during the reconstitution process was developed by Combustion Engineering (CE) and has been implemented in other CE plants (e.g., San Onofre Nuclear Generating Station, Units 2 and 3, Docket Nos. 50-361 and 50-362).

The proposed reconstituted fuel assemblies will meet the same mechanical, nuclear and thermal hydraulic limits as an original fuel assembly described in Chapter 4 of the CESSAR FSAR. Furthermore, the reload safety analysis performed for each cycle will confirm that the use of reconstituted fuel assemblies in the reactor core does not result in exceeding any existing design limit.

The staff has evaluated the proposed change to Specification 5.3.1. Based on that review, the staff has made the following determinations.

- (1) The use of less than a total of 236 fuel rods and burnable poison rods is permitted by the fuel assembly design.
- (2) The fuel assembly design permits reconstitution to replace leaking fuel pins.
- (3) The use of proposed reconstituted fuel assemblies in the reactor core is acceptable when such use is supported by a cycle specific reload analysis which demonstrates that no existing design limits are exceeded.

On the basis of the above evaluation, the staff concludes that the proposed change to 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 CONSIDERATIONS

The amendments involve a change in the installation or use of facility components located within the restricted area as defined in 10 CFR Part 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: May 20, 1988