June 18, 2002

Mr. Gregg R. Overbeck
Senior Vice President, Nuclear
Arizona Public Service Company
P. O. Box 52034
Phoenix, AZ 85072-2034

SUBJECT: PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3 - ISSUANCE OF AMENDMENTS ON VENTILATION FILTER TESTING PROGRAM (TAC NOS. MB3693, MB3694, AND MB3695)

Dear Mr. Overbeck:

The Commission has issued the enclosed Amendment No. 142 to Facility Operating License No. NPF-41, Amendment No. 142 to Facility Operating License No. NPF-51, and Amendment No. 142 to Facility Operating License No. NPF-74 for the Palo Verde Nuclear Generating Station, Units 1, 2, and 3, respectively. The amendments consist of changes to the Technical Specifications (TSs) in response to your application dated December 13, 2001 (102-04632).

The amendments lower the maximum allowable differential pressure across the engineered safety feature ventilation system units in item d of TS 5.5.11, "Ventilation Filter Testing Program (VFTP)," when the units are tested at the specified system flow rates.

A copy of the related Safety Evaluation is also enclosed. The Notice of Issuance will be included in the Commission's next biweekly *Federal Register* notice.

Sincerely,

/RA/

Jack Donohew, Senior Project Manager, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. STN 50-528, STN 50-529,
and STN 50-530

Enclosures: 1. Amendment No. 142 to NPF-41
2. Amendment No. 142 to NPF-51
3. Amendment No. 142 to NPF-74
4. Safety Evaluation

cc w/encls: See next page

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cc w/encls: See next page

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ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-528

PALO VERDE NUCLEAR GENERATING STATION, UNIT 1

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 142
License No. NPF-41

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by the Arizona Public Service Company (APS or the licensee) 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 dated December 13, 2001, 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 rules and 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 changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C(2) of Facility Operating License No. NPF-41 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. 142, 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, except where otherwise stated in specific license conditions.

3. This license amendment is effective as of the date of issuance and shall be implemented within 60 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Stephen Dembek, Chief, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: June 18, 2002

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-529

PALO VERDE NUCLEAR GENERATING STATION, UNIT 2

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 142
License No. NPF-51

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by the Arizona Public Service Company (APS or the licensee) 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 dated December 13, 2001, 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 rules and 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 changes to the Technical Specifications as indicated in the attachment 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. 142 , 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, except where otherwise stated in specific license conditions.

3. This license amendment is effective as of the date of issuance and shall be implemented within 60 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Stephen Dembek, Chief, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: June 18, 2002

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

DOCKET NO. STN 50-530

PALO VERDE NUCLEAR GENERATING STATION, UNIT 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 142
License No. NPF-74

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by the Arizona Public Service Company (APS or the licensee) 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 dated December 13, 2001, 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 rules and 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 changes to the Technical Specifications as indicated in the attachment 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. 142, 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, except where otherwise stated in specific license conditions.

3. This license amendment is effective as of the date of issuance and shall be implemented within 60 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

Stephen Dembek, Chief, Section 2
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: June 18, 2002

ATTACHMENT TO LICENSE AMENDMENT NOS. 142, 142, AND 142

FACILITY OPERATING LICENSE NOS. NPF-41, NPF-51, AND NPF-74

DOCKET NOS. STN 50-528, STN 50-529, AND STN 50-530

Replace the following page of the Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

REMOVE	INSERT
5.5-19	5.5-19

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 142 TO FACILITY OPERATING LICENSE NO. NPF-41,

AMENDMENT NO. 142 TO FACILITY OPERATING LICENSE NO. NPF-51,

AND AMENDMENT NO. 142 TO FACILITY OPERATING LICENSE NO. NPF-74

ARIZONA PUBLIC SERVICE COMPANY, ET AL.

PALO VERDE NUCLEAR GENERATING STATION, UNITS 1, 2, AND 3

DOCKET NOS. STN 50-528, STN 50-529, AND STN 50-530

1.0 INTRODUCTION

By application dated December 13, 2001, the Arizona Public Service Company (the licensee) requested changes to the Technical Specifications (TSs) for the Palo Verde Nuclear Generating Station (PVNGS), Units 1, 2, and 3. The licensee submitted this request 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. The proposed changes would revise Item d of TS 5.5.11, "Ventilation Filter Testing Program (VFTP)," to lower the maximum allowable differential pressure across the engineered safety features (ESF) ventilation system filter units when tested at the specified system flow rates (± 10 percent).

Supplemental information was provided in an e-mail dated April 24, 2002 (ADAMS Accession No. ML021220025). In the supplemental information, the licensee stated that the calculations were based on a combination of final air balance reports, and surveillance and start-up test data of the air filtration units, and explained that the 100 percent maximum dirty filter condition was the maximum allowable differential pressure for the filters. The supplemental information clarified the licensee's application, did not expand the scope of the application as originally noticed, and did not change the Nuclear Regulatory Commission (NRC) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on February 5, 2002 (67 FR 5325).

2.0 BACKGROUND

The proposed amendments involve the control room essential filtration system (CREFS) and the pump room exhaust air cleanup system (PREACS). Both are ESF ventilation filter systems, and are listed in Item d of TS 5.5.11 with the maximum allowed pressure drop (i.e., delta P) across the combined prefilters, high efficiency particulate air (HEPA) filters, and charcoal adsorbers for the specified ventilation system flowrate. Each PVNGS unit has two CREFS and two PREACS air filtration trains, or filter units.

As discussed in the licensee's application, the CREFS includes two identical 100 percent capacity, physically separated high efficiency filtration trains with prefilters, HEPA filters, and charcoal adsorbers that are provided to process both the intake air flow and recirculated air flow in the main control room. In the event of a specified emergency signal, the CREFS units will automatically actuate and operate during an emergency condition to ensure that control room habitability is maintained. The CREFS system is described in Section 6.4 of the PVNGS Updated Final Safety Analysis Report (UFSAR).

The fuel building heating, ventilation, and air-conditioning system consists of two 100 percent capacity exhaust filtration units with prefilters, HEPA filters, and charcoal adsorbers. Each unit exhausts air from the fuel building to the fuel building vent to minimize the release of airborne radioactivity to the environment in the event of a fuel handling accident. These exhaust units are also connected to the auxiliary building ESF equipment rooms and operate to prevent release of unfiltered air from the auxiliary building due to ESF system leakages following a loss-of-coolant accident. These units are designated as the PREACS, but the same units are also identified as the fuel building essential ventilation system (FBEVS). The PREACS/FBEVS system is described in UFSAR Section 9.4.

The CREFS and the PREACS/FBEVS air filtration units were initially sized to deliver a design airflow rate of 28,600 cubic feet per minute (cfm) and 6,000 cfm respectively, at a postulated maximum differential pressure across the filter of 8.4 inches of water gauge. The manufacturer initially set the fan blades to normally clean filter conditions and thus delivered higher airflow rates with corresponding higher air velocities. The higher air velocities did not meet the .25 second residence time for the charcoal filters as specified in Regulatory Guide (RG) 1.52, "Design Inspection and Testing Criteria for Air Filtration and Adsorption Units of Post-Accident Engineered-Safety-Feature Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants," Revision 2. The .25 second residence time is based on a 2-inch charcoal adsorber bed depth.

The licensee explained that, during startup testing of PVNGS, the fan pitch blade settings were adjusted to reduce the airflow rate. The startup test lowering of the airflow rate was not well documented in the site startup test reports. The reduction in airflow capacity was considered necessary because operating with a residence time of less than .25 seconds would result in a lower than 95 percent adsorption efficiency for the charcoal filters. The lower corresponding adsorption efficiency of the charcoal filter (for inorganic and organic iodine) would result in a higher dose consequence than accounted for in the site radiation dose analysis.

The licensee stated that, due to the lack of documentation after the fans were adjusted during startup testing, it could not be concluded that the flow conditions met the required residence times. Therefore, in order to adequately determine air flows, the licensee performed calculations to document the design basis of the air filtration units. These calculations established a new lower design differential pressure to ensure:

- Air filtration units are capable of delivering the design flows at a full maximum (i.e., a 100 percent maximum dirty filter) differential pressure condition.

- Air filtration units are able to meet the charcoal adsorber residence time when the filters are clean.

- The establishment of new design differential pressures across the filters and charcoal adsorbers at the technical specification specified system flow rates. The new design differential pressures are more conservative than those currently allowed.

- The validation of the design margin by analysis performed in the above referenced calculations are substantiated by field and surveillance tests.

3.0 EVALUATION

TS 5.5.11 established the site VFTP for testing ESF filter ventilation systems in accordance with the following appropriate NRC regulatory guidance:

- NRC Generic Letter 99-02, "Laboratory Testing of Nuclear-Grade Activated Charcoal" allows a 10 percent tolerance in airflow, to envelop the maximum design airflow conditions. This results in a bounding air flow velocity value of 44 feet per minute at the charcoal adsorber. This face velocity corresponds to a two-inch charcoal adsorber bed depth and provides the .25 second nominal residence time in the charcoal.

- RG 1.52, Revision 2, Regulatory Position C.3.i recommends an adsorber system component design criteria for an impregnated activated carbon (charcoal) adsorber system. The adsorber system should be designed for an average residence time of .25 seconds per 2 inches of adsorber bed. The design criteria ensure an adsorption efficiency for the removal of airborne radioactivity. The adsorption efficiency of the charcoal bed and residence time is a direct input into the plant radiological dose calculations.

According to the licensee, calculations were developed to document the design basis and testing standards applied to the CREFS and PREACS/FBEVS air filtration units. The calculations established a new lower filter design differential pressure to ensure that the air filtration units are capable of delivering the design flows at the maximum filter design differential pressure condition (i.e., at the 100 percent maximum dirty filter condition when the filters would be replaced) and are also able to meet the adsorber residence time when the filters are clean. The design margin of the air filtration units is validated by calculations and confirmed by surveillance tests.

In addition, the calculations considered the effects that the emergency diesel generator (EDG) frequency and voltage variations could have on the airflow and residence time. The variations in voltage and frequency from the EDG were found to be minimal with no impact to the air filtration units required flow and residence time design bases. The air filtration unit's performance is still evaluated through the licensee's current surveillance testing that is performed in accordance with the VFTP.

The licensee stated that the analyses documented in the calculations establish a more restrictive design criterion than that which is currently listed in TS 5.5.11.d, and the corresponding VFTP. The design margin of the air filtration systems are validated by analysis performed in the calculations recently developed to document the design basis of the air filtration units, and confirmed by station surveillance tests.

The proposed amendments are to revise the differential pressure (measured in inches of water gauge) across the air filtration units to the more restrictive design criterion. The new differential pressure limit for the CREFS air filtration units is less than or equal to 4.8 inches of water gauge. The new differential pressure limit for the PREACS/FBEVS air filtration units is less than or equal to 5.2 inches of water gauge. These new differential pressure design criteria are more restrictive than the current TS value of less than 8.4 inches of water gauge. The licensee is also proposing to change the "less than" for the differential pressure of the current TS 5.5.11.d to "less than or equal to." The new differential pressure design criterion applies to all three of the PVNGS units.

The NRC staff finds the proposed changes are acceptable because the new design criteria are based on actual system performance. Based on this, the NRC staff concludes that the proposed amendments are acceptable. The licensee has not proposed any changes in the ventilation flow rates, filter efficiencies, or air residence time of the charcoal adsorbers for the CREFS and PREACS. Because the proposed differential pressures for the filters and charcoal adsorbers maintains the .25 second residence time in the charcoal adsorbers, the amendments maintain the iodine filter efficiency of the charcoal adsorbers assumed in the accident analyses for the CREFS and the PREACS, and, therefore, there is no change to any accident analysis.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Arizona State official was notified of the proposed issuance of the amendments. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC 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 a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on such finding (67 FR 5325 dated February 5, 2002). 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 need be prepared in connection with the issuance of the amendments.

6.0 CONCLUSION

The Commission 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 the amendments will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: Vincent Klco
Jay Lee

Date: June 18, 2002

cc:

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