April 19, 2001

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, (PVNGS) UNITS 1, 2, AND 3 - ISSUANCE OF AMENDMENTS ON RESPONSE TIME TESTING FOR ENGINEERED SAFETY FEATURE (ESF) AND REACTOR PRESSURE SYSTEM (RPS) PRESSURE SENSORS (TAC NOS. MB1324, MB1325, AND MB1326)

Dear Mr. Overbeck:

The Commission has issued the enclosed Amendment No. 135 to Facility Operating License No. NPF-41, Amendment No. 135 to Facility Operating License No. NPF-51, and Amendment No. 135 to Facility Operating License No. NPF-74 for the PVNGS, Units 1, 2, and 3, respectively. The amendments consist of changes to the Technical Specifications (TSs) in response to your application dated February 28, 2001 (102-04539), as supplemented April 4, 2001 (102-04556).

The amendments revise the definitions of ESF and RPS response times in Section 1.1 of the TSs to allow either an allocated or measured response time for RPS and ESF pressure sensors in accordance with the Nuclear Regulatory Commission approved topical report NPSD-1167, Revision 2, “Elimination of Pressure Sensor Response Time Testing Requirements,” dated January 2001.

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 N. Donohew, Senior Project Manager, Section 2
Project Directorate IV & Decommissioning
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. 135 to NPF-41
2. Amendment No. 135 to NPF-51
3. Amendment No. 135 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. 135
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 February 28, 2001, as supplemented April 4, 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. 135, 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 45 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

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

Attachment: Changes to the Technical Specifications

Date of Issuance: April 19, 2001

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. 135
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 February 28, 2001, as supplemented April 4, 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. 135, 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 45 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

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

Attachment: Changes to the Technical Specifications

Date of Issuance: April 19, 2001

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. 135
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 February 28, 2001, as supplemented April 4, 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. 135, 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 45 days of the date of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

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

Attachment: Changes to the Technical Specifications

Date of Issuance: April 19, 2001

ATTACHMENT TO LICENSE AMENDMENT NOS. 135, 135, AND 135

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 pages of the Appendix A Technical Specifications with the attached revised pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

REMOVE	INSERT
1.1-4	1.1-4
1.1-5	1.1-5
1.1-6	1.1-6

SAFETY EVALUATION (SE) BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 135 TO FACILITY OPERATING LICENSE NO. NPF-41,

AMENDMENT NO. 135 TO FACILITY OPERATING LICENSE NO. NPF-51,

AND AMENDMENT NO. 135 TO FACILITY OPERATING LICENSE NO. NPF-74

ARIZONA PUBLIC SERVICE COMPANY, (APS) ET AL.

PALO VERDE NUCLEAR GENERATING STATION, (PVNGS) UNITS 1, 2, AND 3

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

1.0 INTRODUCTION

By application dated February 28, 2001, as supplemented April 4, 2001, the APS (the licensee) requested changes to the Technical Specifications (TSs) for the PVNGS (Palo Verde), Units 1, 2, and 3. The APS 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 the definitions of engineered safety feature (ESF) response time and reactor protection system (RPS) response time in TS 1.1, "Definitions," to add the following statement: "In lieu of measurement, response time may be verified for selected components provided that the components and methodology for verification have been previously reviewed and approved by the [Nuclear Regulatory Commission] NRC."

Approval of the amendments will allow either an allocated sensor response time or a measured sensor response time for the identified ESF and RPS pressure sensors when performing response time testing (RTT). The licensee has requested that the NRC staff expedite its review of the proposed amendments so that the amendments may be issued during the upcoming Palo Verde Unit 1 refueling outage in April 2001. The amendments would reduce the occupational exposure for required surveillance of these pressure sensors during refueling outages.

The additional information in the supplemental letter of April 4, 2001, does not expand the scope of the application as noticed and does not change the staff's original proposed no significant hazards consideration determination published in the *Federal Register* on March 20, 2001 (66 FR 15766).

2.0 BACKGROUND

The requirement for periodic testing of reactor trip systems is established in 10 CFR 50.55a, "Codes and Standards." Section 50.55a(h)(2) states the following: "For nuclear power plants

with construction permits issued after January 1, 1971, but before May 13, 1999, protection systems must meet the requirements stated in either [Institute of Electrical and Electronics Engineers] (IEEE) Std. 279, "Criteria for Protection Systems for Nuclear Power Generating Stations," or IEEE Std. 603-1991, "Criteria for Safety Systems for Nuclear Power Generating Stations," and the correction sheet dated January 30, 1995. For nuclear power plants with construction permits issued before January 1, 1971, protection systems must be consistent with their licensing basis or may meet the requirements of IEEE Std. 603-1991 and the correction sheet dated January 30,1995."

In addition, 10 CFR 50.36(c)(2)(ii)(A) requires a TS limiting condition for operation for "installed instrumentation that is used to detect, and indicate in the control room, a significant abnormal degradation of the reactor coolant pressure boundary." Section 50.36(c)(3) also states that "Surveillance requirements are requirements related to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within the safety limits, and that the limiting conditions for operation will be met."

Because the times for equipment operation in an accident analysis are the summation of all response times of components within the protective function, a value for the sensor response time must be included. The sensor response time can be an actual measured value or it can be an assumed value that is allocated to the sensor based on NRC-approved methodology. Combustion Engineering Owners Group (CEOG) topical report (TR) CE NPSD-1167, "Elimination of Pressure Sensor Response Time Testing Requirements," Revision 2, is such a methodology.

In letters dated May 12 and June 6, 2000, the CEOG submitted CE NPSD-1167, Revision 2, which proposed eliminating the requirements for RTT of selected pressure sensors in the RPS and ESF actuation systems (i.e., the emergency core cooling system and the isolation actuation system), and incorporated NRC and utility comments on Revision 1 and corrected Appendices A and C. The methodology in Revision 2 is that the sensor response time is derived from the original manufacturer or from a statistical analysis of the results of previous RTTs, where the statistical analysis is sufficiently conservative to ensure that the allocated response time assigned to the sensor will be valid for 95 percent of the population with a 95 percent confidence level.

The TR modifies pressure transmitter allocated response times from values that were based on historical data collected at plants to values that are based on vendor data of expected response times of properly operating instruments. The TR includes plant-specific information from 5 licensees with a total of 11 nuclear power plants, including Palo Verde Units 1, 2, and 3. The following are the pressure sensors for which the CEOG requested elimination of RTT:

- Rosemount Differential Pressure or Pressure Transmitters Model 1152 DP, HP, AP, and GP, range codes 3, 4, 5, 6, 7, 8, 9, and 0.
- Rosemount 1153 Differential Pressure or Pressure Transmitters Models 1153 D, H, A, and G, range codes 3, 4, 5, 6. 7, 8, and 9.
- Rosemount 1154 Differential Pressure or Pressure Transmitters Models DP, HP, and GP, range codes 4, 5, 6. 7, 8, 9, and 0.
- Rosemount 1154H Differential Pressure or Pressure Transmitters Models D, H, S, range codes 4, 5, 6. 7, 8, and 9.
- Barton 763 and 763A Pressure Transmitter and 764 Differential Pressure Transmitter.

- Foxboro Models N-E11DM, N-E13DM, and E13DM.
- Weed Model N-E11GM.

The TR includes the following recommendations for actions to ensure sensors are operating correctly and that calibration or other surveillance will provide an accurate indication that the dynamic characteristics of the instrument will be accurately reflected in a static calibration.

1. Perform a hydraulic RTT prior to installation of a new transmitter/switch or following refurbishment of the transmitter/switch (e.g., sensor cell or variable damping components) to determine an initial sensor-specific response time value. The power interrupt test is an alternate method to use on force-balance transmitters; the purpose of the test is to verify sensor response time is within the limits of the allocated value for the transmitter function.

2. For transmitters and switches that use capillary tubes, RTT should be performed after initial installation and after any maintenance of modification activity that could damage the capillary tubes.

3. Perform periodic drift monitoring on all Rosemount pressure and differential pressure transmitters, models 1151, 1152, 1153, and 1154. Guidance on drift monitoring can be found in EPRI NP-7121 and Rosemount Technical Bulletins. Drift monitoring intervals should be based on utility response to NRC Bulletin 90-01.

4. If variable damping is used, implement a method to ensure that the potentiometer is at the required setting and cannot be inadvertently changed. This approach should eliminate the need for RTT to detect a variable damping failure mode. Otherwise, RTT each transmitter by hydraulic or electronic white noise analysis methods, at a minimum, following each transmitter calibration.

In letter dated December 5, 2000, the NRC staff issued its SE on CE NPSD-1167, Revision 2. In that evaluation, the NRC staff stated (1) that, based on Revision 2 of the TR and the above recommendations in the TR, RTT is not required for sensors and systems specified in the report to demonstrate satisfactory sensor performance, and that other routine surveillances, such as calibrations and drift monitoring, are sufficient to demonstrate satisfactory sensor performance, and (2) that Revision 2 to CE NPSD-1167 (as modified by the CEOG letter dated June 6, 2000) is acceptable as a basis for eliminating RTT from TSs for the sensors and systems identified in the report.

An acceptable set of TSs to implement the elimination of RTT based on Revision 2 of CE NPSD-1167 is given in NRC/Nuclear Energy Institute (NEI) Technical Specification Task Force (TSTF) traveler TSTF-368, which was approved by the NRC in its letter to NEI of January 25, 2001. TSTF-368 approves changes to the improved Standard Technical Specifications, (STSs) NUREG-1432, “Standard Technical Specifications Combustion Engineering,” Revision 1, dated April 1995, based on NPSD-1167.

3.0 EVALUATION

The proposed amendments would revise the definition of RTT for ESF systems and the RPS in that the following statement would be added to TS Section 1.1: "In lieu of measurement,

response time may be verified for selected components provided that the components and methodology for verification have been previously reviewed and approved by the NRC."

In its application, the licensee stated that in addition to the current method of determining response time, in which a measured sensor response time is obtained, the proposed amendments would allow substitution of an allocated sensor response time either obtained from manufacturer's data or developed from data collected on-site using NRC-approved methodology. The NRC-approved methodology is CE NPSD-1167, Revision 2. The methodology would be applied to the components listed in the TR.

In its application, the licensee addressed the recommendations listed above. The licensee's responses to the recommendations are given below:

1. Perform a hydraulic RTT prior to installation of a new transmitter/switch or following refurbishment of the transmitter/switch (e.g., sensor cell or variable damping components) to determine an initial sensor-specific response time value. The power interrupt test is an alternate method to use on force-balance transmitters; the purpose of the test is to verify sensor response time is within the limits of the allocated value for the transmitter function.

   Licensee's Response: Palo Verde procedures for replacement of transmitters contain the information necessary to establish initial response times for replacement transmitters.

2. For transmitters and switches that use capillary tubes, RTT should be performed after initial installation and after any maintenance of modification activity that could damage the capillary tubes.

   Licensee's Response: Because the transmitters associated with the proposed amendment do not use capillary tubes, this recommendation is not applicable to the proposed amendments.

3. Perform periodic drift monitoring on all Rosemount pressure and differential pressure transmitters, models 1151, 1152, 1153, and 1154. Guidance on drift monitoring can be found in EPRI NP-7121 and Rosemount Technical Bulletins. Drift monitoring intervals should be based on utility response to NRC Bulletin 90-01.

   Licensee's Response: In its application, the licensee addressed this recommendation by discussing its response to NRC Bulletin 90-01. The licensee described its enhanced monitoring program for Rosemount transmitters in its letters of July 20, 1990, March 12, 1993, and October 3, 1995, that were in response to NRC Bulletin 90-01, "Loss of Fill-oil in Transmitters Manufactured by Rosemount," dated March 9, 1990. The Rosemount transmitters are monitored at least once every refueling cycle. This is the program to perform the periodic drift monitoring of Rosemount pressure and differential pressure transmitters, models 1151, 1152, 1153, and 1154. In its letter of October 12, 1995, the staff concluded that the licensee had satisfied the required actions of the bulletin.

   In its application, the licensee stated that since its responses to the Bulletin 90-01 several transmitters were replaced with Rosemount transmitters with sensors that were

manufactured after July 11, 1989, and were removed from the program because they are exempted from the trending requirements of the bulletin.

The licensee stated that the calibration data for the transmitters in the monitoring program is trended and analyzed. Evaluation of the data is performed using the trending criteria provided by Rosemount in its Technical Bulletin No. 4 dated December 22, 1989. The licensee concluded that the evaluations performed to date have not indicated any degradation in performance that would be indicative of a fill-fluid loss.

The licensee also explained that the four transmitters that monitor the pressures of the atmospheric dump valve nitrogen accumulators, which were removed from the enhanced monitoring program because the transmitters do not perform a safety-related function (reported in licensee letter dated October 3, 1995), were still being monitored. The licensee stated that the evaluation of the data on these transmitters has also not indicated that these transmitters are experiencing any degradation in performance that would be indicative of a fill-fluid loss.

4. If variable damping is used, implement a method to ensure that the potentiometer is at the required setting and cannot be inadvertently changed. This approach should eliminate the need for RTT to detect a variable damping failure mode. Otherwise, RTT each transmitter by hydraulic or electronic white noise analysis methods, at a minimum, following each transmitter calibration.

   Licensee's Response: Because the transmitters associated with the proposed amendment do not use variable damping, this recommendation is not applicable to the proposed amendments.

Based on its review of the licensee's responses to the above recommendations, the NRC staff concludes that the licensee has acceptably addressed the recommendations.

In its supplemental letter, the licensee stated that the current RPS/ESF pressure transmitters at Palo Verde are those given in the table for Palo Verde in the NRC staff's SE dated December 5, 2000, except that the approved Barton Model 763A transmitter for the Unit 2 pressurizer pressure high instrument has been replaced by a Rosemount transmitter, Model 1154, Range Code 9. The Rosemount transmitter, Model 1154, Range Code 9 is the approved transmitter for Units 1 and 3 pressurizer pressure high instrument. The licensee went on to state that the replacement was performed in accordance with replacement criterion given in the NRC staff's SE dated December 5, 2000. This criterion states that if the replacement transmitter is one for which RTT elimination has been approved, "the licensee may modify the plant procedures using an allocated response time based upon a vendor-supplied response time value, or upon historical data for that transmitter type and model." The licensee stated that the allocated response time used in future testing will be based on a vendor-supplied response time value or upon historical data for that type and model using the criteria presented in the NRC staff's SE dated December 5, 2000. Therefore, the licensee is following the approved methodology for RTT of replaced pressure sensors in the NRC staff SE dated December 5, 2000.

Based on the above, the licensee has satisfied the conditions in the NRC staff's SE dated December 5, 2000, approving the use of CE NPSD-1167, Revision 2, in that the methodology in

the TR will only be applied to the list of acceptable instruments in the TR, which is the list given in Section 2.0 above, with replacements following the criteria given in the NRC staff's SE. The licensee has also acceptably addressed the recommendations in the NRC staff's SE. The licensee's proposed addition to the definitions of ESF and RSP response time is consistent with the conclusions of the NRC staff's SE in that the revised response time will be applied only to the selected components and in accordance with the methodology in CE NPSD-1167, Revision 2. The list of components and the methodology will be incorporated into the TS Bases for surveillance requirements on ESF and RPS response times. The proposed amendments are consistent with the NRC-approved TSTF-368 for the Combustion Engineering improved STSs in NUREG-1432 and the TSs for Palo Verde are based on NUREG-1432. Based on this, the licensee's proposed amendments to TS Section 1.1 for ESF and RPS response times are acceptable.

The NRC staff also reviewed the licensee's proposed changes to the Bases of the TSs. The proposed changes to the Bases shown in the application and supplemental letter are consistent with the NRC staff's SE for CE NPSD-1167, Revision 2, and TSTF-368.

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 (66 FR 15766). 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: Jack Donohew

Date: April 19, 2001