May 15, 1996

Mr. William L. Stewart
Executive Vice President, Nuclear
Arizona Public Service Company
Post Office Box 53999
Phoenix, Arizona 85072-3999

SUBJECT: ISSUANCE OF EMERGENCY AMENDMENTS FOR THE PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 1 (TAC NO. M95375), UNIT NO. 2 (TAC NO. M95376), AND UNIT NO. 3 (TAC NO. M95377)

Dear Mr. Stewart:

The Commission has issued the enclosed Amendment No. 107 to Facility Operating License No. NPF-41, Amendment No. 99 to Facility Operating License No. NPF-51, and Amendment No. 79 to Facility Operating License No. NPF-74 for the Palo Verde Nuclear Generating Station, Unit Nos. 1, 2, and 3, respectively. The amendments consist of changes to the Technical Specifications in response to your application dated May 15, 1996.

The amendment would revise Surveilance Requirement (SR) 4.5.2.d.2 in TS 3/4 5.2 to state that the trisodium phosphate (TSP) contained in the storage baskets in containment is in the form of anhydrous TSP, rather than dodecahydrate TSP, as currently specified.

A copy of the related Safety Evaluation is also enclosed. A Notice of Issuance and Final Determination of No Significant Hazards Consideration and Opportunity for Hearing will be included in the Commission's next biweekly Federal Register notice.

Sincerely,
Original signed by:
Charles R. Thomas, Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

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

Enclosures: 1. Amendment No. 107 to NPF-41
2. Amendment No. 99 to NPF-51
3. Amendment No. 79 to NPF-74
4. Safety Evaluation

cc w/encls: See next page

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Docket File	KPerkins, WCFO
PUBLIC	RHuey, RIV
PDIV-2 Reading	GHill (6), T5C3
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WBateman	JBianchi, WCFO (2)
CGrimes, O11E22	ACRS, T2E26
JClifford	CThomas
EPeyton	CVM (SE)
JKilcrease, RIV	

*For previous concurrences see attached ORC

DOCUMENT NAME: PV95375.AMD

OFC	LA:PDIV-2	PDIV-2	ECGB*	OGC	PDIV-2/DIR
NAME	EPeyton	CThomas	DTerao		WBateman
DATE	5/15/96	5/15/96	5/15/96	5/15/96	5/15/96

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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 15, 1996

Mr. William L. Stewart
Executive Vice President, Nuclear
Arizona Public Service Company
Post Office Box 53999
Phoenix, Arizona 85072-3999

SUBJECT: ISSUANCE OF EMERGENCY AMENDMENTS FOR THE PALO VERDE NUCLEAR GENERATING STATION, UNIT NO. 1 (TAC NO. M95375), UNIT NO. 2 (TAC NO. M95376), AND UNIT NO. 3 (TAC NO. M95377)

Dear Mr. Stewart:

The Commission has issued the enclosed Amendment No. 107 to Facility Operating License No. NPF-41, Amendment No. 99 to Facility Operating License No. NPF-51, and Amendment No. 79 to Facility Operating License No. NPF-74 for the Palo Verde Nuclear Generating Station, Unit Nos. 1, 2, and 3, respectively. The amendments consist of changes to the Technical Specifications in response to your application dated May 15, 1996.

The amendment would revise Surveilance Requirement (SR) 4.5.2.d.2 in TS 3/4 5.2 to state that the trisodium phosphate (TSP) contained in the storage baskets in containment is in the form of anhydrous TSP, rather than dodecahydrate TSP, as currently specified.

A copy of the related Safety Evaluation is also enclosed. A Notice of Issuance and Final Determination of No Significant Hazards Consideration and Opportunity for Hearing will be included in the Commission's next biweekly Federal Register notice.

Sincerely,

Charles R. Thomas, Project Manager
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

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

Enclosures: 1. Amendment No. 107 to NPF-41
2. Amendment No. 99 to NPF-51
3. Amendment No. 79 to NPF-74
4. Safety Evaluation

cc w/encls: See next page

cc w/encls:
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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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. 107
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 May 15, 1996, 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. 107, 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.

FOR THE NUCLEAR REGULATORY COMMISSION

James C. Stone

For William H. Bateman, Director
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: May 15, 1996

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 107 TO FACILITY OPERATING LICENSE NO. NPF-41

DOCKET NO. STN 50-528

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised pages are identified by Amendment number and contain marginal lines indicating the areas of change. The corresponding overleaf pages are also provided to maintain document completeness.

REMOVE	INSERT
3/4 5-5	3/4 5-5
B 3/4 5-2	B 3/4 5-2

1. A visual inspection of the containment sump and verifying that the subsystem suction inlets are not restricted by debris and that the sump components (trash racks, screens, etc.) show no evidence of structural distress or corrosion.

2. Verifying that a minimum total of 464 cubic feet of solid granular anhydrous trisodium phosphate (TSP) is contained within the TSP storage baskets.

3. Verifying that when a representative sample of 0.055 ± 0.001 lb of TSP from a TSP storage basket is submerged, without agitation, in 1.0 ± 0.05 gallons of 77 ± 9 °F borated water from the RWT, the pH of the mixed solution is raised to greater than or equal to 7 within 4 hours.

e. At least once per 18 months, during shutdown, by:

1. Verifying that each automatic valve in the flow path actuates to its correct position on (SIAS and RAS) test signal(s).

2. Verifying that each of the following pumps start automatically upon receipt of a safety injection actuation test signal:

a. High pressure safety injection pump.

b. Low pressure safety injection pump.

3. Verifying that on a recirculation actuation test signal, the containment sump isolation valves open, the HPSI, LPSI and CS pump minimum bypass recirculation flow line isolation valves and combined SI mini-flow valve close, and the LPSI pumps stop.

4. Conducting an inspection of all ECCS piping outside of containment, which is in contact with recirculation sump inventory during LOCA conditions, and verifying that the total measured leakage from piping and components is less than 1 gpm when pressurized to at least 40 psig.

f. By verifying that each of the following pumps develops the indicated differential pressure at or greater than their respective minimum allowable recirculation flow when tested pursuant to Specification 4.0.5:

1. High pressure safety injection pump greater than or equal to 1761 psid.

2. Low pressure safety injection pump greater than or equal to 165 psid.

3/4.5.1 SAFETY INJECTION TANKS

The OPERABILITY of each of the Safety Injection System (SIS) safety injection tanks ensures that a sufficient volume of borated water will be immediately forced into the reactor core through each of the cold legs in the event the RCS pressure falls below the pressure of the safety injection tanks. This initial surge of water into the RCS provides the initial cooling mechanism during large RCS pipe ruptures.

The limits on safety injection tank volume, boron concentration, and pressure ensure that the safety injection tanks will adequately perform their function in the event of a LOCA in MODE 1, 2, 3, or 4.

A minimum of 25% narrow range corresponding to 1790 cubic feet and a maximum of 75% narrow range corresponding to 1927 cubic feet of borated water are used in the safety analysis as the volume in the SITs. To allow for instrument accuracy, 28% narrow range corresponding to 1802 cubic feet and 72% narrow range corresponding to 1914 cubic feet, are specified in the Technical Specification.

A minimum of 593 psig and a maximum pressure of 632 psig are used in the safety analysis. To allow for instrument accuracy 600 psig minimum and 625 psig maximum are specified in the Technical Specification.

A boron concentration of 2000 ppm minimum and 4400 ppm maximum are used in the safety analysis. The Technical Specification lower limit of 2300 ppm in the SIT assures that the backleakage from RCS will not dilute the SITs below the 2000 ppm limit assumed in the safety analysis prior to the time when draining of the SIT is necessary.

The SIT isolation valves are not single failure proof; therefore, whenever the valves are open power shall be removed from these valves and the switch keylocked open. These precautions ensure that the SITs are available during a Limiting Fault.

The SIT nitrogen vent valves are not single failure proof against depressurizing the SITs by spurious opening. Therefore, power to the valves is removed while they are closed to ensure the safety analysis assumption of four pressurized SITs.

All of the SIT nitrogen vent valves are required to be operable so that, given a single failure, all four SITs may still be vented during post-LOCA long-term cooling. Venting the SITs provides for SIT depressurization capability which ensures the timely establishment of shutdown cooling entry conditions as assumed by the safety analysis for small break LOCAs.

The limits for operation with a safety injection tank inoperable for any reason except an isolation valve closed minimizes the time exposure of the plant to a LOCA event occurring concurrent with failure of an additional safety injection tank which may result in unacceptable peak cladding temperatures. If a closed isolation valve cannot be immediately opened, the full capability of one safety injection tank is not available and prompt action is required to place the reactor in a MODE where this capability is not required.

For MODES 3 and 4 operation with pressurizer pressure less than 1837 psia the Technical Specifications require a minimum of 57% wide range corresponding

SAFETY INJECTION TANKS (Continued)

to 1361 cubic feet and a maximum of 75% narrow range corresponding to 1927 cubic feet of borated water per tank, when three safety injection tanks are operable and a minimum of 36% wide range corresponding to 908 cubic feet and a maximum of 75% narrow range corresponding to 1927 cubic feet per tank, when four safety injection tanks are operable at a minimum pressure of 235 psig and a maximum pressure of 625 psig. To allow for instrument inaccuracy, 60% wide range instrument corresponding to 1415 cubic feet, and 72% narrow range instrument corresponding to 1914 cubic feet, when three safety injection tanks are operable, and 39% wide range instrument corresponding to 962 cubic feet, and 72% narrow range instrument corresponding to 1914 cubic feet, when four SITs are operable, are specified in the Technical Specifications. To allow for instrument inaccuracy 254 psig is specified in the Technical Specifications.

The instrumentation vs. volume correlation for the SITs is as follows:

Volume	Narrow Range	Wide Range
962 ft^3	<0%	39%
1415 ft^3	<0%	60%
1802 ft^3	28%	78%
1914 ft^3	72%	83%

3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS

The OPERABILITY of two separate and independent ECCS subsystems with the indicated RCS pressure greater than or equal to 1837 psia, or with the indicated RCS cold leg temperature greater than or equal to 485 degrees F ensures that sufficient emergency core cooling capability will be available in the event of a LOCA assuming the loss of one subsystem through any single failure consideration. These indicated values include allowances for uncertainties. Either subsystem operating in conjunction with the safety injection tanks is capable of supplying sufficient core cooling to limit the peak cladding temperatures within acceptable limits for all postulated break sizes ranging from the double-ended break of the largest RCS cold leg pipe downward. In addition, each ECCS subsystem provides long-term core cooling capability in the recirculation mode during the accident recovery period.

The Mode 3 safety analysis credits one HPSI pump to provide negative reactivity insertion to protect the core and RCS following a steam line break when RCS cold leg temperature is 485 degrees F or greater. Requiring two operable ECCS subsystems in the situation will ensure one HPSI pump is available assuming single failure of the other HPSI pump.

With the RCS cold leg temperature below 485 degrees F, one OPERABLE ECCS subsystem is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the limited core cooling requirements.

The anhydrous trisodium phosphate (TSP) stored in dissolving baskets located in the containment basement is provided to minimize the possibility of corrosion cracking of certain metal components during operation of the ECCS following a LOCA. The TSP provides this protection by dissolving in the sump water and causing its final pH to be raised to greater than or equal to 7.0.

The surveillance requirements provided to ensure OPERABILITY of each component ensure that at a minimum, the assumptions used in the safety analyses are met and that subsystem OPERABILITY is maintained. Surveillance requirements for throttle valve position stops and flow balance testing provide

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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. 99
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 May 15, 1996, 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. 99, 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.

FOR THE NUCLEAR REGULATORY COMMISSION

For William H. Bateman, Director
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: May 15, 1996

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 99 TO FACILITY OPERATING LICENSE NO. NPF-51

DOCKET NO. STN 50-529

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change. The corresponding overleaf pages are also provided to maintain document completeness.

REMOVE	INSERT
3/4 5-5	3/4 5-5
B 3/4 5-2	B 3/4 5-2

SURVEILLANCE REQUIREMENTS (Continued)

g. By verifying the correct position of each electrical and/or mechanical position stop for the following ECCS throttle valves:

1. Within 4 hours following completion of each valve stroking operation or maintenance on the valve when the ECCS subsystems are required to be OPERABLE.

2. At least once per 18 months.

LPSI System Valve Number	Hot Leg Injection Valve Number
1. SIB-UV 615, SIA-HV 306	1. SIC-HV 321
2. SIB-UV 625, SIB-HV 307	2. SID-HV 331
3. SIA-UV 635	
4. SIA-UV 645	

h. By performing a flow balance test, during shutdown, following completion of modifications to the ECCS subsystems that alter the subsystem flow characteristics and verifying the following flow rates:

HPSI System - Single Pump

The sum of the injection line flow rates, excluding the highest flow rate, is greater than or equal to 816 gpm.

LPSI System - Single Pump

1. Injection Loop 1, total flow equal to 4800 $\pm$ 200 gpm
2. Injection Legs 1A and 1B when tested individually, with the other leg isolated, shall be within 200 gpm of each other.
3. Injection Loop 2, total flow equal to 4800 $\pm$ 200 gpm
4. Injection Legs 2A and 2B when tested individually, with the other leg isolated, shall be within 200 gpm of each other.

Simultaneous Hot Leg and Cold Leg Injection - Single Pump

1. The hot leg flowrate is greater than or equal to 525 gpm;
2. The sum of the cold leg flowrates is greater than or equal to 525 gpm; and
3. The total pump flowrate does not exceed 1200 gpm.

SURVEILLANCE REQUIREMENTS (Continued)

1. A visual inspection of the containment sump and verifying that the subsystem suction inlets are not restricted by debris and that the sump components (trash racks, screens, etc.) show no evidence of structural distress or corrosion.

2. Verifying that a minimum total of 464 cubic feet of solid granular anhydrous trisodium phosphate (TSP) is contained within the TSP storage baskets.

3. Verifying that when a representative sample of 0.055 ± 0.001 lb of TSP from a TSP storage basket is submerged, without agitation, in 1.0 ± 0.05 gallons of 77 ± 9 °F borated water from the RWT, the pH of the mixed solution is raised to greater than or equal to 7 within 4 hours.

e. At least once per 18 months, during shutdown, by:

1. Verifying that each automatic valve in the flow path actuates to its correct position on (SIAS and RAS) test signal(s).

2. Verifying that each of the following pumps start automatically upon receipt of a safety injection actuation test signal:

a. High pressure safety injection pump.

b. Low pressure safety injection pump.

3. Verifying that on a recirculation actuation test signal, the containment sump isolation valves open, the HPSI, LPSI and CS pump minimum bypass recirculation flow line isolation valves and combined SI mini-flow valve close, and the LPSI pumps stop.

4. Conducting an inspection of all ECCS piping outside of containment, which is in contact with recirculation sump inventory during LOCA conditions, and verifying that the total measured leakage from piping and components is less than 1 gpm when pressurized to at least 40 psig.

f. By verifying that each of the following pumps develops the indicated differential pressure at or greater than their respective minimum allowable recirculation flow when tested pursuant to Specification 4.0.5:

1. High pressure safety injection pump greater than or equal to 1761 psid.

2. Low pressure safety injection pump greater than or equal to 165 psid.

3/4.5.1 SAFETY INJECTION TANKS

The OPERABILITY of each of the Safety Injection System (SIS) safety injection tanks ensures that a sufficient volume of borated water will be immediately forced into the reactor core through each of the cold legs in the event the RCS pressure falls below the pressure of the safety injection tanks. This initial surge of water into the RCS provides the initial cooling mechanism during large RCS pipe ruptures.

The limits on safety injection tank volume, boron concentration, and pressure ensure that the safety injection tanks will adequately perform their function in the event of a LOCA in MODE 1, 2, 3, or 4.

A minimum of 25% narrow range corresponding to 1790 cubic feet and a maximum of 75% narrow range corresponding to 1927 cubic feet of borated water are used in the safety analysis as the volume in the SITs. To allow for instrument accuracy, 28% narrow range corresponding to 1802 cubic feet and 72% narrow range corresponding to 1914 cubic feet, are specified in the Technical Specification.

A minimum of 593 psig and a maximum pressure of 632 psig are used in the safety analysis. To allow for instrument accuracy 600 psig minimum and 625 psig maximum are specified in the Technical Specification.

A boron concentration of 2000 ppm minimum and 4400 ppm maximum are used in the safety analysis. The Technical Specification lower limit of 2300 ppm in the SIT assures that the backleakage from RCS will not dilute the SITs below the 2000 ppm limit assumed in the safety analysis prior to the time when draining of the SIT is necessary

The SIT isolation valves are not single failure proof; therefore, whenever the valves are open power shall be removed from these valves and the switch keylocked open. These precautions ensure that the SITs are available during a Limiting Fault.

The SIT nitrogen vent valves are not single failure proof against depressurizing the SITs by spurious opening. Therefore, power to the valves is removed while they are closed to ensure the safety analysis assumption of four pressurized SITs.

All of the SIT nitrogen vent valves are required to be operable so that, given a single failure, all four SITs may still be vented during post-LOCA long-term cooling. Venting the SITs provides for SIT depressurization capability which ensures the timely establishment of shutdown cooling entry conditions as assumed by the safety analysis for small break LOCAs.

The limits for operation with a safety injection tank inoperable for any reason except an isolation valve closed minimizes the time exposure of the plant to a LOCA event occurring concurrent with failure of an additional safety injection tank which may result in unacceptable peak cladding temperatures. If a closed isolation valve cannot be immediately opened, the full capability of one safety injection tank is not available and prompt action is required to place the reactor in a MODE where this capability is not required.

For MODES 3 and 4 operation with pressurizer pressure less than 1837 psia

SAFETY INJECTION TANKS (Continued)

the Technical Specifications require a minimum of 57% wide range corresponding to 1361 cubic feet and a maximum of 75% narrow range corresponding to 1927 cubic feet of borated water per tank, when three safety injection tanks are operable and a minimum of 36% wide range corresponding to 908 cubic feet and a maximum of 75% narrow range corresponding to 1927 cubic feet per tank, when four safety injection tanks are operable at a minimum pressure of 235 psig and a maximum pressure of 625 psig. To allow for instrument inaccuracy, 60% wide range instrument corresponding to 1415 cubic feet, and 72% narrow range instrument corresponding to 1914 cubic feet, when three safety injection tanks are operable, and 39% wide range instrument corresponding to 962 cubic feet, and 72% narrow range instrument corresponding to 1914 cubic feet, when four SITs are operable, are specified in the Technical Specifications. To allow for instrument inaccuracy 254 psig is specified in the Technical Specifications.

The instrumentation vs. volume correlation for the SITs is as follows:

Volume	Narrow Range	Wide Range
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1802 ft^3	28%	78%
1914 ft^3	72%	83%

3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS

The OPERABILITY of two separate and independent ECCS subsystems with the indicated RCS pressure greater than or equal to 1837 psia, or with the indicated RCS cold leg temperature greater than or equal to 485 degrees F ensures that sufficient emergency core cooling capability will be available in the event of a LOCA assuming the loss of one subsystem through any single failure consideration. These indicated values include allowances for uncertainties. Either subsystem operating in conjunction with the safety injection tanks is capable of supplying sufficient core cooling to limit the peak cladding temperatures within acceptable limits for all postulated break sizes ranging from the double-ended break of the largest RCS cold leg pipe downward. In addition, each ECCS subsystem provides long-term core cooling capability in the recirculation mode during the accident recovery period.

The Mode 3 safety analysis credits one HPSI pump to provide negative reactivity insertion to protect the core and RCS following a steam line break when RCS cold leg temperature is 485 degrees F or greater. Requiring two operable ECCS subsystems in the situation will ensure one HPSI pump is available assuming single failure of the other HPSI pump.

With the RCS cold leg temperature below 485 degrees F, one OPERABLE ECCS subsystem is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the limited core cooling requirements.

The anhydrous trisodium phosphate (TSP) stored in dissolving baskets located in the containment basement is provided to minimize the possibility of corrosion cracking of certain metal components during operation of the ECCS following a LOCA. The TSP provides this protection by dissolving in the sump water and causing its final pH to be raised to greater than or equal to 7.0.

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NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

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. 79
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 May 15, 1996, 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. 79, 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.

FOR THE NUCLEAR REGULATORY COMMISSION

For James C. Stone

William H. Bateman, Director
Project Directorate IV-2
Division of Reactor Projects III/IV
Office of Nuclear Reactor Regulation

Attachment: Changes to the Technical Specifications

Date of Issuance: May 15, 1996

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 79 TO FACILITY OPERATING LICENSE NO. NPF-74

DOCKET NO. STN 50-530

Replace the following pages of the Appendix A Technical Specifications with the enclosed pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change. The corresponding overleaf pages are also provided to maintain document completeness.

REMOVE	INSERT
3/4 5-5	3/4 5-5
B 3/4 5-2	B 3/4 5-2

SURVEILLANCE REQUIREMENTS (Continued)

1. A visual inspection of the containment sump and verifying that the subsystem suction inlets are not restricted by debris and that the sump components (trash racks, screens, etc.) show no evidence of structural distress or corrosion.

2. Verifying that a minimum total of 464 cubic feet of solid granular anhydrous trisodium phosphate (TSP) is contained within the TSP storage baskets.

3. Verifying that when a representative sample of 0.055 ± 0.001 lb of TSP from a TSP storage basket is submerged, without agitation, in 1.0 ± 0.05 gallons of 77 ± 9 °F borated water from the RWT, the pH of the mixed solution is raised to greater than or equal to 7 within 4 hours.

e. At least once per 18 months, during shutdown, by:

1. Verifying that each automatic valve in the flow path actuates to its correct position on (SIAS and RAS) test signal(s).

2. Verifying that each of the following pumps start automatically upon receipt of a safety injection actuation test signal:

a. High pressure safety injection pump.

b. Low pressure safety injection pump.

3. Verifying that on a recirculation actuation test signal, the containment sump isolation valves open, the HPSI, LPSI and CS pump minimum bypass recirculation flow line isolation valves and combined SI mini-flow valve close, and the LPSI pumps stop.

4. Conducting an inspection of all ECCS piping outside of containment, which is in contact with recirculation sump inventory during LOCA conditions, and verifying that the total measured leakage from piping and components is less than 1 gpm when pressurized to at least 40 psig.

f. By verifying that each of the following pumps develops the indicated differential pressure at or greater than their respective minimum allowable recirculation flow when tested pursuant to Specification 4.0.5:

1. High pressure safety injection pump greater than or equal to 1761 psid.

2. Low pressure safety injection pump greater than or equal to 165 psid.

SURVEILLANCE REQUIREMENTS (Continued)

g. By verifying the correct position of each electrical and/or mechanical position stop for the following ECCS throttle valves:

1. Within 4 hours following completion of each valve stroking operation or maintenance on the valve when the ECCS subsystems are required to be OPERABLE.

2. At least once per 18 months.

LPSI System Valve Number	Hot Leg Injection Valve Number
1. SIB-UV 615, SIA-HV 306	1. SIC-HV 321
2. SIB-UV 625, SIB-HV 307	2. SID-HV 331
3. SIA-UV 635	
4. SIA-UV 645	

h. By performing a flow balance test, during shutdown, following completion of modifications to the ECCS subsystems that alter the subsystem flow characteristics and verifying the following flow rates:

HPSI System - Single Pump

The sum of the injection line flow rates, excluding the highest flow rate, is greater than or equal to 816 gpm.

LPSI System - Single Pump

1. Injection Loop 1, total flow equal to 4800 $\pm$ 200 gpm
2. Injection Legs 1A and 1B when tested individually, with the other leg isolated, shall be within 200 gpm of each other.
3. Injection Loop 2, total flow equal to 4800 $\pm$ 200 gpm
4. Injection Legs 2A and 2B when tested individually, with the other leg isolated, shall be within 200 gpm of each other.

Simultaneous Hot Leg and Cold Leg Injection - Single Pump

1. The hot leg flowrate is greater than or equal to 525 gpm;
2. The sum of the cold leg flowrates is greater than or equal to 525 gpm; and
3. The total pump flowrate does not exceed 1200 gpm.

3/4.5.1 SAFETY INJECTION TANKS

The OPERABILITY of each of the Safety Injection System (SIS) safety injection tanks ensures that a sufficient volume of borated water will be immediately forced into the reactor core through each of the cold legs in the event the RCS pressure falls below the pressure of the safety injection tanks. This initial surge of water into the RCS provides the initial cooling mechanism during large RCS pipe ruptures.

The limits on safety injection tank volume, boron concentration, and pressure ensure that the safety injection tanks will adequately perform their function in the event of a LOCA in MODE 1, 2, 3, or 4.

A minimum of 25% narrow range corresponding to 1790 cubic feet and a maximum of 75% narrow range corresponding to 1927 cubic feet of borated water are used in the safety analysis as the volume in the SITs. To allow for instrument accuracy, 28% narrow range corresponding to 1802 cubic feet and 72% narrow range corresponding to 1914 cubic feet, are specified in the Technical Specification.

A minimum of 593 psig and a maximum pressure of 632 psig are used in the safety analysis. To allow for instrument accuracy, 600 psig minimum and 625 psig maximum are specified in the Technical Specification.

A boron concentration of 2000 ppm minimum and 4400 ppm maximum are used in the safety analysis. The Technical Specification lower limit of 2300 ppm in the SIT assures that the backleakage from RCS will not dilute the SITs below the 2000 ppm limit assumed in the safety analysis prior to the time when draining of the SIT is necessary.

The SIT isolation valves are not single failure proof; therefore, whenever the valves are open power shall be removed from these valves and the switch keylocked open. These precautions ensure that the SITs are available during a Limiting Fault.

The SIT nitrogen vent valves are not single failure proof against depressurizing the SITs by spurious opening. Therefore, power to the valves is removed while they are closed to ensure the safety analysis assumption of four pressurized SITs.

All of the SIT nitrogen vent valves are required to be operable so that, given a single failure, all four SITs may still be vented during post-LOCA long-term cooling. Venting the SITs provides for SIT depressurization capability which ensures the timely establishment of shutdown cooling entry conditions as assumed by the safety analysis for small break LOCAs.

The limits for operation with a safety injection tank inoperable for any reason except an isolation valve closed minimizes the time exposure of the plant to a LOCA event occurring concurrent with failure of an additional safety injection tank which may result in unacceptable peak cladding temperatures. If a closed isolation valve cannot be immediately opened, the full capability of one safety injection tank is not available and prompt action is required to place the reactor in a MODE where this capability is not required.

For MODES 3 and 4 operation with pressurizer pressure less than 1837 psia the Technical Specifications require a minimum of 57% wide range corresponding

SAFETY INJECTION TANKS (Continued)

to 1361 cubic feet and a maximum of 75% narrow range corresponding to 1927 cubic feet of borated water per tank, when three safety injection tanks are operable and a minimum of 36% wide range corresponding to 908 cubic feet and a maximum of 75% narrow range corresponding to 1927 cubic feet per tank, when four safety injection tanks are operable at a minimum pressure of 235 psig and a maximum pressure of 625 psig. To allow for instrument inaccuracy, 60% wide range instrument corresponding to 1415 cubic feet, and 72% narrow range instrument corresponding to 1914 cubic feet, when three safety injection tanks are operable, and 39% wide range instrument corresponding to 962 cubic feet, and 72% narrow range instrument corresponding to 1914 cubic feet, when four SITs are operable, are specified in the Technical Specifications. To allow for instrument inaccuracy 254 psig is specified in the Technical Specifications.

The instrumentation vs. volume correlation for the SITs is as follows:

Volume	Narrow Range	Wide Range
962 ft^3	<0%	39%
1415 ft^3	<0%	60%
1802 ft^3	28%	78%
1914 ft^3	72%	83%

3/4.5.2 and 3/4.5.3 ECCS SUBSYSTEMS

The OPERABILITY of two separate and independent ECCS subsystems with the indicated RCS pressure greater than or equal to 1837 psia, or with the indicated RCS cold leg temperature greater than or equal to 485 degrees F ensures that sufficient emergency core cooling capability will be available in the event of a LOCA assuming the loss of one subsystem through any single failure consideration. These indicated values include allowances for uncertainties. Either subsystem operating in conjunction with the safety injection tanks is capable of supplying sufficient core cooling to limit the peak cladding temperatures within acceptable limits for all postulated break sizes ranging from the double-ended break of the largest RCS cold leg pipe downward. In addition, each ECCS subsystem provides long-term core cooling capability in the recirculation mode during the accident recovery period.

The Mode 3 safety analysis credits one HPSI pump to provide negative reactivity insertion to protect the core and RCS following a steam line break when RCS cold leg temperature is 485 degrees F or greater. Requiring two operable ECCS subsystems in the situation will ensure one HPSI pump is available assuming single failure of the other HPSI pump.

With the RCS cold leg temperature below 485 degrees F, one OPERABLE ECCS subsystem is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the limited core cooling requirements.

The anhydrous trisodium phosphate (TSP) stored in dissolving baskets located in the containment basement is provided to minimize the possibility of corrosion cracking of certain metal components during operation of the ECCS following a LOCA. The TSP provides this protection by dissolving in the sump water and causing its final pH to be raised to greater than or equal to 7.0.

The surveillance requirements provided to ensure OPERABILITY of each component ensure that at a minimum, the assumptions used in the safety analyses are met and that subsystem OPERABILITY is maintained. Surveillance requirements for throttle valve position stops and flow balance testing provide

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 107 TO FACILITY OPERATING LICENSE NO. NPF-41,

AMENDMENT NO. 99 TO FACILITY OPERATING LICENSE NO. NPF-51,

AND AMENDMENT NO. 79 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 application dated May 15, 1996, the Arizona Public Service Company (APS or the licensee) requested changes to the Technical Specifications (TSs) (Appendix A to Facility Operating License Nos. NPF-41, NPF-51, and NPF-74, respectively) for the Palo Verde Nuclear Generating Station, Units 1, 2, and 3. The Arizona Public Service Company 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 Surveillance Requirement (SR) 4.5.2.d.2 in TS 3/4 5.2 to state that the trisodium phosphate (TSP) contained in the storage baskets in containment is in the form of anhydrous TSP, rather than dodecahydrate TSP, as currently specified.

2.0 EVALUATION

TSP is installed in containment to act as a passive form of pH control for containment spray and core cooling water after a loss-of-coolant accident (LOCA). The dissolution of the TSP in the baskets results in a neutral to slightly alkaline solution which precludes release of volatile iodine into the containment atmosphere during recirculation following a LOCA. Buffering of the borated LOCA inventory also minimizes the effects of chloride and caustic stress corrosion on mechanical systems and components. The proposed amendment would revise the surveillance requirement of TS 4.5.2.d.2 and the associated Bases to specify that anhydrous TSP is used to control pH, rather than dodecahydrate TSP.

The amount of TSP required is based on the quantities of borated water that accumulate in the sump and containment floor following a LOCA. The analyses specific to PVNGS conservatively assume the total flood volume would exceed the complete inventories of the reactor coolant system, refueling water tank,

and safety injection tank and assume a concentration of 4400 ppm boron as boric acid in the sump solution. This assumption is conservative based on actual flooding analyses and yields greater requirements in terms of required amounts of equivalent TSP. Based on this conservative assessment of the total containment post-LOCA inventory and boron concentration, the required amount of anhydrous TSP (464 ft^3) is in excess of the amount required to achieve a neutral pH (430 ft^3).

Either form of the buffering agent would provide adequate neutralization of the borated flood water following a LOCA since both materials are chemically equivalent. Hence, the use of the anhydrous form does not present any compatibility issues relative to the dodecahydrate form. However, the two forms differ in their physical characteristics and in particular, the amount of effective TSP per sample mass. Anhydrous TSP yields greater buffering capacity per sample mass relative to the dodecahydrate form. However, anhydrous TSP, when subjected to high humidity tends to hydrate, forming a semicrystalline solid. With hydration and crystallization of the anhydrous TSP, relative dissolution decreases. The quantity of anhydrous TSP in excess of that required (430 ft^3) provides margin to account for this potential decrease in dissolution. Once dissolved, however, both species yield TSP in solution to buffer the pH but the anhydrous form provides greater buffering capacity at a ratio to the dodecahydrate form of approximately 2.31 to 1.

The anhydrous material, although retarded by agglomeration when the material hydrates, still possesses high dissolution characteristics. The dissolution rate of the solid hydrated form has been demonstrated by the acceptable performance of the 18-month surveillance tests conducted in accordance with TS 4.5.2.d.3. This surveillance test verifies dissolution characteristics by demonstrating that a representative sample of the anhydrous material dissolves in water without agitation and raises the pH of the water to greater than or equal to 7 within a 4-hour period. Further, the dissolution rates of the anhydrous material have been compared with dissolution rates of packed TSP dodecahydrate. In solid form, both provide nearly the same dissolution rates per surface area. Because of the chemical composition of the anhydrous form, agglomeration or caking will result, but satisfactory dissolution of the anhydrous material will occur, yielding the required post-LOCA pH control.

Analysis also demonstrates that the use of anhydrous TSP, in the quantities currently contained in all three units, does not result in alkaline conditions beyond a pH of 8.5, thus ensuring proper pH for equipment qualification. This analysis assumed the minimum sump inventory and the maximum available anhydrous TSP.

The use of anhydrous TSP provides acceptable pH control with acceptable dissolution rates to ensure pH within the range required to support suppression of iodine generation and to maintain conditions within the band assumed for equipment qualification. Sufficient quantities of anhydrous TSP are presently installed in all units to achieve a neutral pH under the worst conditions. Regardless of material agglomeration, the anhydrous TSP will dissolve at an acceptable rate to support long-term pH control. Use of the

anhydrous material does not introduce any compatibility issues since the anhydrous and the hydrated forms of TSP are chemically equivalent.

3.0 CONCLUSION

The staff has reviewed the licensee's submittal to revise TS 4.5.2.d.2 and the associated Bases to specify that the TSP contained in the baskets in containment is in the anhydrous form rather than the dodecahydrate form. TS 4.5.2.d.2 requires that the specified volume of 464 cubic feet of solid granular TSP be contained in the storage baskets to condition the sump water following a LOCA. The required pH of the sump solution is based on the long-term retention of iodine and is sufficient to avoid stress corrosion cracking of austenitic stainless steel and excessive generation of hydrogen by the corrosion of containment metals.

The proposed amendment revises the TS to specify that the form of TSP stored in containment for conditioning of the sump water following a LOCA is the currently installed form of anhydrous TSP, rather than dodecahydrate TSP. The staff has determined that the proposed amendment involves no changes in the amount or type of effluent that may be released offsite and results in no increase in individual or cumulative occupational radiation exposure. The staff finds this change to be acceptable.

4.0 EXPLANATION OF THE EMERGENCY CIRCUMSTANCES

The licensee is in the process of converting the TSs for all three units to the revised standard technical specifications (STS) contained in Revision 1 of NUREG-1432, "Standard Technical Specifications for Combustion Engineering Plants." As part of this conversion process, information contained in the current technical specifications was being validated. In validating the quantity of trisodium phosphate (TSP) contained in the baskets in containment, the licensee noticed that the form of the TSP in the containment baskets is the anhydrous form, rather than the dodecahydrate form specified in TS 4.5.2.d.2 and in the Bases for TSs 3/4.5.2 and 3/4.5.3, "ECCS Subsystems."

Since the surveillance to verify the containment baskets contained the correct volume of the dodecahydrate form of TSP had not been satisfied, the 24-hour provision of TS 4.0.3 was entered at 7:00 PM mountain standard time (MST) on May 14, 1996. At the same time both emergency core cooling system trains were declared inoperable. According to the provisions of TS 4.0.3 and Generic Letter 87-09, "Sections 3.0 and 4.0 of the Standard Technical Specifications (STS) on the Applicability of Limiting Conditions for Operation and Surveillance Requirements," if a surveillance is missed, the licensee has 24 hours to perform the surveillance or to obtain the relief from the requirement from the Nuclear Regulatory Commission.

Since the design basis of the plant specifies that the form of TSP in containment is anhydrous, the licensee is submitting the enclosed TS change under emergency circumstances to revise the TS requirement. Since this condition was discovered only when the TS was reviewed as part of the

conversion effort, the emergency circumstances could not be avoided. Failure to satisfy the surveillance requirement at the end of the 24-hour action (i.e., 7:00 PM MST on May 15, 1996) would necessitate the shutdown of all three units at PVNGS.

5.0 NO SIGNIFICANT HAZARDS CONSIDERATION DETERMINATION

The Commission has provided standards for determining whether a significant hazards consideration exists as stated in 10 CFR 50.92. A proposed amendment to an operating license for a facility involves a no significant hazards consideration if operation of the facility, in accordance with the proposed amendment, would not (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety. A discussion of these standards as they relate to this amendment request follows.

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

The proposed change does not involve an increase in the probability or consequences of an accident previously evaluated. The form of the TSP used to control pH following a LOCA cannot directly or indirectly increase the probability of any design basis accident.

Following a LOCA, the use of an anhydrous TSP will ensure that adequate pH control is maintained to preclude release of iodine from the sump water and to inhibit chloride and caustic stress corrosion of mechanical systems and components. Upon contact with the water coming from the containment spray and from flood water from the break, anhydrous TSP will dissolve quickly enough to ensure proper buffering capacity in spite of possible crystallization of the anhydrous material. Anhydrous TSP is chemically equivalent to TSP dodecahydrate, and the change would not affect the consequences of an accident previously evaluated.

Standard 2--Does the proposed change create the possibility of a new or different kind of accident previously evaluated?

Installation of anhydrous TSP relative to the dodecahydrate form does not introduce the possibility of a new or different kind of accident from any accident previously evaluated. Both forms of the buffering agent are chemically equivalent. The use of anhydrous TSP does not result in any compatibility issues. The material provides adequate pH control following a LOCA, is functionally equivalent to the dodecahydrate form, and does not create the possibility of a new or different kind of accident from any previously evaluated.

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

The margin of safety is maintained by the use of anhydrous TSP. The material provides the necessary pH control following a LOCA so that iodine, washed to the containment sump by containment spray action, remains in solution and is not released due to acidic conditions. Consequently, iodine concentrations in the containment atmosphere are maintained well within the concentrations assumed for calculations of the offsite dose. Anhydrous TSP is chemically equivalent and provides adequate buffing capability and, therefore, does not involve a reduction in a margin of safety.

Thus, the NRC staff finds that the proposed change does not involve a significant hazards consideration.

6.0 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.

7.0 ENVIRONMENTAL CONSIDERATION

The amendments changes a surveillance requirement. 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 made a final no significant hazards consideration finding with respect to this amendment. 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.

8.0 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: C. Thomas

Date: May 15, 1996